

Peter Uhlenberg
Editor

International Handbooks of Population 1

International Handbook of Population Aging



Springer

International Handbook of Population Aging

International Handbooks of Population

Volume 1

Series Editor

Dudley L. Poston, Jr.
Professor of Sociology, George T. & Gladys H. Abell Professor of Liberal Arts
Director, Asian Studies Program
Texas A&M University
ACAD Bldg. 425B (office)
College Station, Texas 77843-4351, USA

The *International Handbooks of Population* offer up-to-date scholarly summaries and sources of information on the major subject areas and issues of demography and population. Each handbook examines its particular subject area in depth, providing timely, accessible coverage of its full scale and scope, discusses substantive contributions for deeper understanding, and provides reliable guidance on the direction of future developments.

Volumes will explore topics of vital interest: Population Aging, Poverty, Mortality, Family Demography, Migration, Race and Ethnic Demography and more. Each volume will provide a state-of-the-art treatment of its respective area. The series will quickly prove useful to a broad audience including demographers, practitioners and scholars across a range of disciplines.

For other titles in this series, go to: www.springer.com/series/8111

Peter Uhlenberg
Editor

International Handbook of Population Aging

 Springer

Peter Uhlenberg
Department of Sociology
University of North Carolina
Hamilton Hall
Chapel Hill, NC 27599-3210
CB 3210, USA
uhlen@email.unc.edu

ISBN: 978-1-4020-8355-6

e-ISBN: 978-1-4020-8356-3

Library of Congress Control Number: applied for the Library of Congress Control number

© 2009 Springer Science+Business Media B.V.

No part of this work may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, microfilming, recording or otherwise, without written permission from the Publisher, with the exception of any material supplied specifically for the purpose of being entered and executed on a computer system, for exclusive use by the purchaser of the work.

Printed on acid-free paper

9 8 7 6 5 4 3 2 1

springer.com

Acknowledgement

While preparing this handbook, I have greatly appreciated the special perspective on life provided by my wife (Pam), my children (Matthew, Jeffrey, Annette, Alison, Hollianne, Heidi, Joshua, Benjamin, Aaron, Joanna, Nathaniel, Arwen, Preston and Isaac) and my grandchildren (those present and those on their way).

Contents

Introduction	1
Peter Uhlenberg	
Part I. Overview	
1. How Populations Age	7
Joshua R. Goldstein	
2. Data Sources for Studying Aging	19
Markus H. Schafer and Kenneth F. Ferraro	
3. Global Population Aging: History and Prospects	37
Donald T. Rowland	
Part II. Aging Populations	
4. Population Ageing in Italy and Southern Europe	69
Cecilia Tomassini and Giovanni Lamura	
5. Demography of Aging in the Nordic Countries	91
Gerdt Sundström	
6. Rapidly Aging Populations: Russia/Eastern Europe	113
Natalia S. Gavrilova and Leonid A. Gavrilov	
7. Rapid Population Aging and Changing Intergenerational Transfers in Japan	133
Naohiro Ogawa, Rikiya Matsukura and Maliki	
8. Population Aging in China	157
Feinian Chen and Guangya Liu	
9. Population Aging in the Koreas	173
Dudley L. Poston and Mary Ann Davis	
10. Population Aging in Canada and the United States	191
Tracey A. LaPierre and Mary Elizabeth Hughes	
11. Aging in Mexico and Latin America	231
Rebeca Wong and Alberto Palloni	
12. Ageing in West Africa	253
Isabella Aboderin	
13. Demography of Aging in Arab Countries	277
Kathryn M. Yount and Abla M. Sibai	
Part III. Migration and Aging	
14. Geographic Mobility and Aging in Place	319
Don E. Bradley and Charles F. Longino	
15. International Retirement Migration	341
Tony (A.M.) Warnes	

16. Immigrants and Aging	365
Judith Treas and Jeanne Batalova	
17. Replacement Migration	395
Charles B. Keely	
Part IV. Population Aging and Economic Issues	
18. Public Pension Programs – Social Security	407
Diane M. Watts-Roy and John B. Williamson	
19. Private Pensions in International Perspective	429
Angela M. O’Rand, Donald Ebel and Katelin Isaacs	
20. Employment at Older Ages	445
Sara E. Rix	
21. Population Retirement Patterns	471
David J. Ekerdt	
22. Income Inequality in Later Life	493
Melissa Hardy	
Part V. Population Aging, Longevity, and Health	
23. Mortality Patterns in Late Life	521
Robert A. Hummer, Richard G. Rogers, Ryan K. Masters and Jarron M. Saint Onge	
24. Active Life Expectancy: A Central Measure of Population Health	543
Sarah B. Laditka and James N. Laditka	
25. Demography of Disability	567
Scott M. Lynch, J. Scott Brown and Miles G. Taylor	
26. Social Class, Health and Longevity	583
Pamela Herd	
Part VI. Health Care and Aging	
27. Population Aging and Health Care Policy in Cross-National Perspective	607
Stephen Crystal and Michele J. Siegel	
28. Health Care Expenditures	631
Edward C. Norton and Sally C. Stearns	
29. Demography of Informal Caregiving	647
Emily M. Agree and Karen Glaser	
Part VII. Population Aging and Social Relationships	
30. Childless Old Age	671
Pearl A. Dykstra	
31. Marital History and Well-Being in Later Life	691
Linda J. Waite	
32. Gender, Aging and Widowhood	705
Deborah Carr and Susan Bodnar-Deren	
Part VIII. Future of Aging	
33. The Future of Human Longevity	731
S. Jay Olshansky and Bruce A. Carnes	
34. Experience, Social Structure and Later Life: Meaning and Old Age in an Aging Society	747
Dale Dannefer and Robin Shura	
Index	757

Contributors

- Isabella Aboderin** Oxford University, Oxford, UK
- Emily M. Agree** Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA
- Jeanne Batalova** Migration Policy Institute, Washington, DC, USA
- Susan Bodnar-Deren** Rutgers University, News Brunswick, NJ, USA
- Don E. Bradley** East Carolina University, Greenville, NC, USA
- J. Scott Brown** Miami University, Oxford, OH, USA
- Bruce A. Carnes** University of Oklahoma Health Sciences Center, Lindsay, OK, USA
- Deborah Carr** Rutgers University, New Brunswick, NJ, USA
- Feinian Chen** North Carolina State University, Raleigh, NC, USA
- Stephen Crystal** Rutgers University, New Brunswick, NJ, USA
- Dale Dannefer** Case Western Reserve University, Cleveland, OH, USA
- Mary Ann Davis** Sam Houston State University, Huntsville, TX, USA
- Pearl A. Dykstra** Netherlands Interdisciplinary Demographic Institute and Utrecht University, The Netherlands
- Donald Ebel** Duke University, Durham, NC, USA
- David J. Ekerdt** University of Kansas, Lawrence, KS, USA
- Kenneth F. Ferraro** Purdue University, West Lafayette, IN, USA
- Leonid A. Gavrilov** University of Chicago, Chicago, IL, USA
- Natalia S. Gavrilova** University of Chicago, Chicago, IL, USA
- Karen Glaser** King's College London, University of London, London, UK
- Joshua R. Goldstein** Max Planck Institute for Demographic Research, Rostock, Germany
- Melissa Hardy** The Pennsylvania State University, Pennsylvania, PA, USA
- Pamela Herd** University of Wisconsin-Madison, Madison, WI, USA
- Mary Elizabeth Hughes** Johns Hopkins University, Baltimore, MD, USA
- Robert A. Hummer** University of Texas, Austin, TX, USA
- Katelin Isaacs** Duke University, Durham, NC, USA

- Charles B. Keely** Georgetown University, Washington, DC, USA
- James N. Laditka** University of North Carolina – Charlotte, Charlotte, NC, USA
- Sarah B. Laditka** University of North Carolina – Charlotte, Charlotte, NC, USA
- Giovanni Lamura** INRCA, Dept. of Gerontological Research, Ancona, Italy
- Tracey A. LaPierre** University of Kansas, Lawrence, KS, USA
- Guangya Liu** North Carolina State University, Raleigh, NC, USA
- Charles F. Longino** Deceased
- Scott M. Lynch** Princeton University, Princeton, NJ, USA
- Maliki** Nihon University, Chiyoda-ku, Tokyo, Japan
- Ryan K. Masters** University of Texas, Austin, TX, USA
- Rikiya Matsukura** Nihon University, Chiyoda-ku, Tokyo, Japan
- Edward C. Norton** University of Michigan, Ann Arbor, MI, USA
- Angela M. O’Rand** Duke University, Durham, NC, USA
- Naohiro Ogawa** Nihon University, Chiyoda-ku, Tokyo, Japan
- S. Jay Olshansky** University of Illinois, Chicago, IL, USA
- Jarron M. Saint Onge** University of Houston, Houston, TX, USA
- Alberto Palloni** Northwestern University, Evanston, IL, USA
- Dudley L. Poston, Jr.** Texas A&M University, College Station, TX, USA
- Sara E. Rix** AARP Public Policy Institute, Washington, DC, USA
- Richard G. Rogers** University of Colorado, Boulder, CO, USA
- Donald T. Rowland** The Australian National University, Canberra, Australia
- Markus H. Schafer** Purdue University, West Lafayette, IN, USA
- Robin Shura** Case Western Reserve University, Cleveland, OH, USA
- Abla Sibai** American University of Beirut, Beirut, Lebanon
- Michele J. Siegel** Rutgers University, News Brunswick, NJ, USA
- Sally Stearns** University of North Carolina – Chapel Hill, Chapel Hill, NC, USA
- Gerdt Sundström** Jönköping University, Jönköping, Sweden
- Miles G. Taylor** Florida State University, Tallahassee, FL, USA
- Cecilia Tomassini** Università del Molise, Italy
- Judith Treas** University of California, Irvine, UK
- Peter Uhlenberg** University of North Carolina – Chapel Hill, Chapel Hill, NC, USA
- Linda J. Waite** NORC & University of Chicago, Chicago, IL, USA
- Tony (A.M.) Warnes** University of Sheffield, Sheffield, UK

Diane M. Watts-Roy Boston College, Chestnut Hill, MA, USA

John B. Williamson Boston College, Chestnut Hill, MA, USA

Rebeca Wong University of Texas Medical Branch, Galveston, TX, USA

Kathryn M. Yount Emory University, Atlanta, GA, USA

Introduction

Peter Uhlenberg

The classic handbook of population, *The Study of Population* edited by Philip Hauser and Otis Dudley Duncan, was published in 1959. As described on the dust jacket, this book was "...an encyclopedic summary of the field of demography, ranging from its historical beginnings to promising subjects for its future study..." Not only was "population aging" not included as the title of one of the 28 chapters in this encyclopedic volume on demographic knowledge but the term was not even included in the index. Demographers at that time did, of course, understand the determinants of a population's age distribution and a discussion of this topic was included. But population aging was simply not an issue of much interest at a time when the world population was still young – the number of children under age 15 in 1960 was 7 times larger than the number of people over age 65 and the number under age 5 was 22 times the number over age 80. Even in Northern and Western Europe in 1960, where the demographic transition was most advanced, there were twice as many children under age 15 as there were people over age 65.

But decreasing fertility and increasing life expectancy after 1960 altered the ratio of young to old in the world population and population projections to 2050 suggest that global population aging will progress rapidly in coming decades. The most dramatic population aging is occurring among populations with sustained very low fertility rates. In Southern Europe, which has become the region of Europe with lowest fertility in recent decades, the number of people over age 65 exceeded the number of children under age 15

by the beginning of the twenty-first century and projections show that by 2035 there will be twice as many over age 65 as under age 15. In Italy and in Japan, where extraordinarily low fertility is persisting, projections indicate that by 2050 there will be three times as many people over age 80 as children under age 5. Although population aging is progressing at different paces in different parts of the world, significant population aging is expected in every region of the world in coming decades. The emergence of global population aging as one of the most important demographic trends in the world today has stimulated scholars to give increasing attention to its social, political and economic implications. Indeed, research in the area of population aging has now progressed to such an extent that it seems timely to offer an international handbook focused on the demography of aging.

The United Nations' 2007 edition of *World Population Ageing* (<http://www.un.org/esa/population/publications/WPA2007/wpp2007.htm>), identifies four salient aspects of global population aging. First, population aging is unprecedented in human history. Throughout almost all of world history the old made up less than 5 percent of the population in any country and in no region of the world did older people ever comprise more than one-tenth of the population before 1950. Second, population aging is pervasive, now affecting nearly every part of the world. Even in the less developed regions of the world, the per cent of the population aged 65+ is projected to triple between 2000 and 2050 (from 5 percent to 15 percent). Third, population aging is enduring – there is no serious prospect of future reversals of the population aging now occurring around the world. Fourth and most important for this volume, population aging has profound consequences. The chapters in this handbook offer

P. Uhlenberg
Department Sociology, CB 3210
University of North Carolina
Chapel Hill, NC 27599-3210
USA
E-mail: uhlen@email.unc.edu

state-of-the-art overviews of research on many of the profound consequences and implications of population aging.

The chapters in *Part I* focus on three basic population aging issues that are foundational for the chapters that follow. Joshua Goldstein begins this discussion by addressing why, from a demographic perspective, populations age. This involves first identifying how population aging is measured and then explicating how specific changes in demographic behavior determine changes in population age distribution. The second issue concerns the empirical data available to study population aging. An overview of the population data available and a variety of issues related to analyzing these data are covered in the chapter by Markus Schafer and Kenneth Ferraro. Donald Rowland completes this overview section with an essay on the broad historical development of global population aging and on future prospects for population aging. In complimentary ways, chapters 1 and 3 both discuss the relationship between the demographic transition and population aging.

Part II explores the extent of population aging in several different areas of the world and the most salient issues related to population aging in each of these areas. Ten countries or regions were selected for special attention in this section. Three of these regions are in Europe, where significant population aging first occurred. Countries in Southern Europe have experienced extraordinarily rapid aging in recent decades and now have some of the oldest populations in the world. Cecilia Tomassini and Giovanni Lamura review what is happening here, with special emphasis on Italy. The Nordic countries (Gerdt Sundstrom) were among the first to experience population aging and represent societies in which strong welfare states have given a great deal of attention to policies related to needs of older people. A still different pattern of population aging is seen in Russia and Eastern Europe (Natalia S. Gavrilova and Leonid A. Gavrilov), where populations are declining in size and where old-age welfare systems were radically altered as a part of the restructuring that occurred when the Communist regimes fell.

Three other countries receiving special attention are in Asia. Japan (Naohiro Ogawa, Rikiya Matsukura, and Maliki) has the oldest population of any major country today and is expected to maintain that place in coming decades, as it continues to age rapidly. China (Feinian Chen and Guangya Liu) is of great interest to

demographers, not only because it has the largest population of any country (1.3 billion) but also because the government has played such a pivotal role in its demographic transition. The precipitous drop in fertility following implementation of the one-child policy will lead to unparalleled population aging in China over the first half of the twenty-first century. Finally, an interesting comparison of different paths to population aging is provided by examining developments in South and North Korea (Dudley L. Poston and Mary Ann Davis).

Despite the enormous amount of attention given to population aging in the United States, the United States actually has a younger population than other highly developed countries. Reasons for this are made clear in the chapter written by M.E. Hughes and Tracey LaPierre on population aging in Canada and the United States and comparisons between these two neighboring countries reveal some important contrasts.

The final three regions included in this section have not yet experienced rapid population aging but merit attention in order to fill out the global nature of population aging. Population aging in Mexico and Latin America (Rebeca Wong and Alberto Palloni) will accelerate in coming decades and in many areas this will occur in the context of weak economies and high levels of inequality. Compared to other regions of the world, the populations of West African countries (Isabella Aboderin) are expected to remain relatively young in the coming decades. Still, major demographic and social changes are occurring in West Africa and these changes have significant implications for the well-being of older persons in this region. Finally, Kathryn M. Yount and Abla Sibai review research in Arab countries, where concern with aging issues is only recently emerging and where support for older people is still viewed primarily as a private matter.

Part III contains four chapters examining different aspects of the relationship between population aging and migration. Don Bradley and Charles Longino note that although older people are less likely to move than younger adults (i.e., most people “age in place”), there are a number of interesting questions related to post-retirement migration. They give special attention to how cohorts entering old age in coming decades (the “baby boomers”) may have different later life mobility patterns than those that preceded them. Both historical and contemporary patterns of international retirement migration are discussed in the chapter by Tony

Warnes. He shows how the freer global movement of capital and people produces great diversity in types of international migration among retirees. Although most international migrants are not old at the time of migration, they often grow old in the country to which they immigrated. Judith Treas and Jeanne Batalova discuss issues related to this aging of immigrants and how the later life well-being of immigrants might be affected by recent changes in international migration patterns and by migration policies. Finally, Charles Keely writes a historically informed chapter on “replacement migration” – the extent to which international migration can be used to counter the effects of fertility and mortality rates on population age distributions.

Part IV focuses on economic and labor force challenges created by population aging. Perhaps no population aging issue has received more attention than the future viability of social security programs. Diane Watts-Roy and John Williamson survey public old-age pension programs in a number of countries and discuss how countries differ in responding to the challenge of funding these programs when there is a changing ratio of retirees to workers. In addition to public pensions, private pensions are also an important source of income for older people in many developed countries. Angela O’Rand, Donald Ebel and Katelin Isaacs provide a comparative perspective on how private pension programs fit into old-age income strategies and how private pension programs are currently changing. Reliance on pension income could, of course, be reduced if workers exited the labor force at later ages. Historical trends in labor force participation at older ages and prospects for significantly extending the average work life are discussed by Sara Rix. The flip side of labor force participation in later life, retirement, is the focus of David Ekerdt’s chapter. He considers not only the social, economic and political forces that shape retirement patterns but also the meaning of the retirement stage of the life course for members of a society. Because older people differ in the amount of income they receive from public pensions, private pensions and continuing to work, as well in value of their assets, there is substantial inequality in income within the older population. Melissa Hardy reviews both the empirical and theoretical literature dealing with income inequality in later life and shows how a life course perspective provides insights into sources of inequality.

Part V deals with changing patterns of longevity and health in later life. Robert Hummer, Richard Rogers, Ryan Masters and Jarron Saint Onge examine causes both of the large declines reported in mortality at older ages in recent decades and of the persistent differentials found in late life death rates. Sarah Laditka and James Laditka review the growing literature on active life expectancy, where the crucial question is whether the years of life added by declining mortality are lived in a healthy or unhealthy state. Central to the concept of active life expectancy is the age pattern of disability in a population. Both theoretical and empirical discussions of this topic are included in the chapter on demography of disability by Scott Lynch, J. Scott Brown and Miles Taylor. Finally, Pamela Herd examines in depth an issue introduced in the three preceding chapters – the relationship between social class, health and longevity.

The challenges of meeting the health care needs of aging populations probably receive as much research and policy attention as the challenges related to funding social security programs. The chapters in *Part VI* consider three facets of providing health care for the elderly. Stephen Crystal and Michele Siegel examine health care policies in a variety of countries, as well as the relationship between population aging and national health costs. Edward Norton and Sally Stearns critically review what is known about end of life health care expenditures under changing demographic conditions. However, national health care expenditures do not fully reflect the extent of caregiving because they do not consider the value of the extensive caregiving provided by kin. The chapter by Emily Agree and Karen Glaser fills in this void as it covers the demography of informal caregiving.

Population aging has important implications not only for old age income and health care but also for the structure of social relationships in later life. Several aspects of aging and social relationships are covered in *Part VII*. The demographic forces that produce population aging also produce changes in the composition of families and kin networks. Pearl Dykstra compares rates of childlessness across societies and through time and explores the implications of being childless in old age in different settings. Linda Waite focuses on demographic change and marital status in old age and on the relationship between marital history and well-being. The final chapter in this section, written by Deborah

Carr and Susan Bodnar-Deren, explores gender differences in the experience of widowhood.

Part VIII consists of two concluding chapters dealing with the future of aging. Jay Olshansky and Bruce Carnes look at the historically unprecedented increase in life expectancy over the past one hundred and fifty years and ask whether we should expect the same trend in increasing longevity to persist through the twenty-first century. In the final chapter, Dale Dannefer and Robin Shura consider the highly significant issue of the cultural meaning of age and old age in modern societies. As older people become an increasingly large proportion of the population, will past tendencies toward age segregation and marginalization of elders be reversed?

A remarkable shift occurred between 1960 and the present in population issues considered most salient and problematic. In the 1960s the “population explo-

sion” drove a great deal of demographic research and led alarmists to predict dire global consequences of unprecedented rates of population growth. But as fertility rates plummeted in the last half of the twentieth century, attention shifted to a new demographic phenomenon – “graying of the population”. Again, there is a spate of alarmist writing, this time warning about the perils of population aging. The writers of the chapters in this handbook do not portray population aging as a crisis. However, they do recognize that there are profound global implications of the population aging now occurring. An aging world presents human societies with both challenges and opportunities. A starting place for responding to these is an understanding of what is occurring. The chapters in this handbook provide an exceptional overview of what is known about population aging and its implications and the issues that future research will need to address.

Part I

Overview

Chapter 1

How Populations Age

Joshua R. Goldstein

Introduction

In this chapter, I explain how changes in birth, death and migration act to change the age structure of populations. We will see how population aging is an inevitable part of the transition to lower rates of population growth that follow the demographic transition from high fertility and high mortality to low fertility and low mortality.

Contemporary populations vary tremendously in their age structure. In low fertility, low mortality populations like Japan there is 1 child under age ten for every person in their seventies. In a country like Pakistan, with a history of high fertility and where not so many survive to old ages, there are 10 children for every person in their seventies.

These numbers play out in everyday life. The classic street scene in either an historical or contemporary high fertility society is full of children, playing and working (Livi Bacci 2001). The elderly are few. The turnover of the population is rapid, with newcomers holding a large share of the slots in a society and with places of power opening relatively rapidly (Keyfitz 1973).

The age structure of a population also has important economic consequences (Lee 1994). Childhood is a time of learning, consumption and economic dependence. Much of adulthood is a time of production, savings and economic independence. In old age, adults often become net consumers once again, living off any accumulated savings as well as transfers from younger generations. Changes in age structure are an important force – although not the only one – that drives the

shares of the population that are net consumers and net producers.

Both populations that are very young and very old have high “dependency” burdens, with a relatively small portion of the population in active working ages. Around the world, governments are concerned as they face the prospect of population aging and the challenges of supporting a population that is potentially more dependent. The challenges of aging also play out at a more personal level: the age structure of families will on average reflect the age composition of the population. As families age, more and more demands may be placed on the shoulders of fewer potential caregivers.

The goals of this chapter are first to give an overview of how demographers measure population age structure and aging and how such measures vary around the world. Secondly, the chapter shows how patterns of demographic rates – in births, deaths and migration – determine the age structure of a population. Finally, I discuss some ways that societies can adapt to population aging by shifting the definitions of who is elderly and who is young.

Measuring Population Aging

At any moment in time, a population’s age structure can be described by the numbers of people at each given age. Typical census tabulation groups the population into 5 (or 10) year age groups. These numbers are illustrated using a population pyramid, showing the numbers in each age group by sex, with females on the right and males on the left. Figure 1.1 shows some examples of such pyramids for Pakistan, New Zealand and Japan

J. R. Goldstein
Max Planck Institute for Demographic Research
Rostock, Germany
E-mail: goldstein@demogr.mpg.de

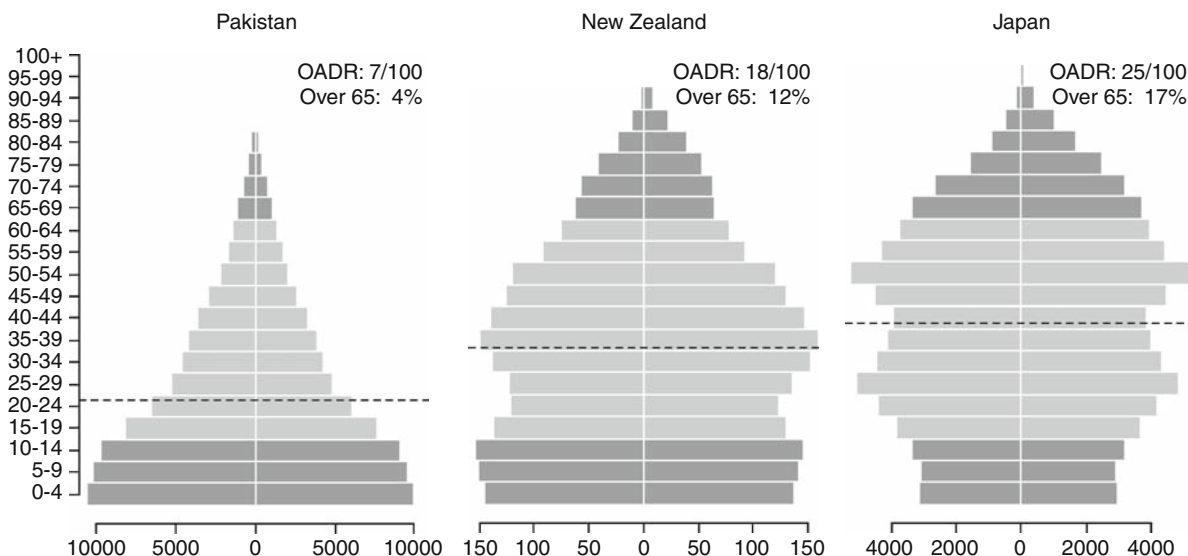


Fig. 1.1 Age pyramids for selected countries in the year 2000. Source: UN (2006). OADR is the “Old Age Dependency Ratio”, the ratio of the number aged over 65 to that aged 15 to 64

using estimates for the year 2000. Pakistan, a country with a long history of high fertility and population growth, has the youngest age structure. New Zealand, with a history of slow population growth and some ups-and-downs in fertility, has a considerably older age structure, which will age further as the baby-boomers move into retirement. Japan, with the highest longevity in the world and several decades of sub-replacement fertility, has an even older population age structure than New Zealand.

The visual comparison of the entire age distribution is a good way to see the full age distribution. For conciseness and to compare across populations easily, demographers use a set of single-numbers to summarize this age distribution. These include generic statistical measures like the mean, median and mode, as well as ratios of age groups. Also, the proportion of the population that is elderly (e.g., >65) is often used.¹

The mean age is simply the average age of people in the population. The median age is the age that divides the population into two equal halves. The modal age is the age with the largest number of individuals.

Each of these measures has advantages and disadvantages. The mean age is easy to understand but – because age distributions are not symmetric – tends to differ considerably from the age of most individuals in the popula-

tion. An advantage of the median is that exact ages of all of the individuals are not needed. In particular, an open oldest age interval (say 75+) poses no obstacle for calculating the median but forces assumptions to be made about the distribution of people in this oldest age group in order to calculate the mean. In growing populations the modal age tends to zero and so is not very useful for differentiation. However, the mode is a revealing measure for distinguishing different shrinking populations.

In addition to these summary measures, demographers are often interested in measures that capture the differing characteristic of people by age. “Dependency ratios” are the most popular way of doing this. “Active” and “dependent” ages are defined, with the young and old defined as “dependent” – the United Nations counts those under 15 as “young” and those over 65 as “old” – and those in the middle are the “active”. The ratio of “old” to “active” population age groups is the old-age dependency ratio.

The old-age dependency ratios for Pakistan, New Zealand and Japan in 2000 were 7/100, 18/100 and 25/100 elderly per person of working age. Alternatively, we can look at the reciprocal, saying that there are 14 “workers” per “retiree” in Pakistan; compared to less than 6 in New Zealand and only 4 in Japan. These are the kinds of numbers that tend to scare fiscal planners. By 2050, it is forecast that there will only be 1.35 workers per retiree in Japan (an old-age dependency ratio of 74/100).

¹ See Chu (1997) for a critical view of measures of aging involving the simple proportion over a given age.

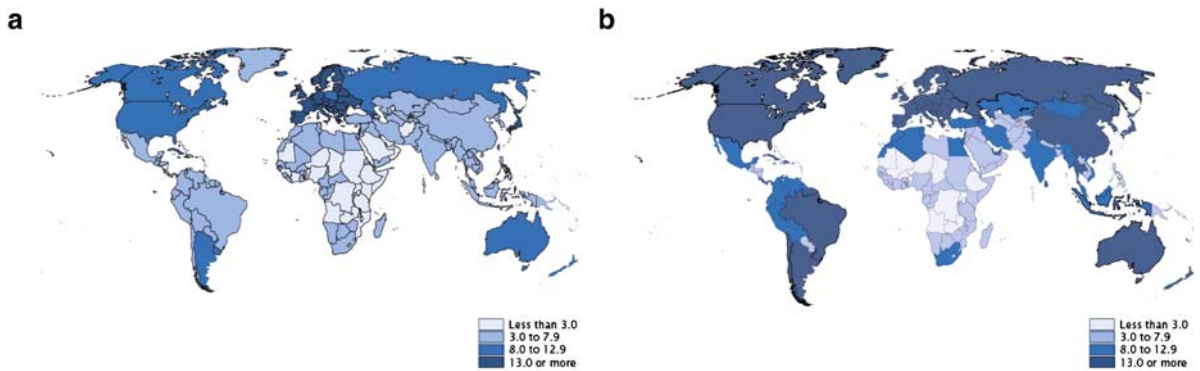


Fig. 1.2 (a) Percentage aged 65 and over, 2000. Source: Kinsella and Velkoff (2001), (b) Percentage aged 65 and over, 2030. Source: Kinsella and Velkoff (2001)

One advantage of the dependency ratios is that they have an interpretation in terms of transfer rates and tax rates. While it is hard to have intuition about the implications of a year's difference in mean age, a change in the old age dependency ratio can sometimes be easier to understand. In a pay-as-you-go pension system, the tax rate is proportional to the ratio of pension receivers (the elderly) to tax payers (the workers).² Thus, all other things being equal, the change in old-age dependency ratios in Japan from 25/100 in 2000 to 74/100 in 2050 implies a near tripling of the pension tax burden.

Despite their ease of calculation and interpretation, dependency ratios should be treated with some skepticism. While age and dependency are clearly related concepts, they are not the same thing. The young can be relatively more or less independent. Those of working age can be working or not. And the elderly can be more or less productive and more or less consuming. In fact, the definition of dependency ratios suggests a solution to problems associated with population aging. Changing the social and economic definitions of young and old and increasing the number working by increasing labor force participation of women, the old, and the under-employed – these are exactly the kind of solutions that aging societies are seeking (Vaupel and Loichinger 2006). In addition, increasing produc-

tivity can counterbalance rising dependency ratios, by increasing the output of each worker. We will return to these issues in the final section of this chapter.

An Overview of Population Aging

The world as a whole has not yet aged dramatically. From 1950 to 2000, the median age of the world population rose only from 23.9 to 26.7 years. But in the decades ahead, populations will age significantly: by 2050, the median age is forecast to be 38.1.

In the industrial world, the small number of births during the Great Depression followed by the rise in births after World War II created decades in which there were relatively few elderly and many workers. This is set to change quite quickly in the decade-or-so ahead as the large post-war cohorts are entering retirement. In the longer term, populations will age further as the small birth cohorts of the 1970s enter their working years.

In the developing world, the decline in fertility seen in almost every part of the world except Sub-Saharan Africa and parts of the Middle East will eventually lead to population aging. In addition, throughout the world – with the exception again of Sub-Saharan Africa – increasing longevity will further population aging. The dramatic change that is to be expected is well-illustrated in maps produced by the U.S. Census Bureau. The two panels in Fig. 1.2 show the percentage of the population over age 65 around the world. In 2000, the club of the oldest population is exclusively European and Japanese. But by 2030, this group will be joined by Russia, China,

² In a pay-as-you-go pensions system, retirees are paid by taxes on current workers. For the system to be in balance, taxes collected must equal benefits paid out. Formally, $t y W = b O$, where t is the tax rate, y is the average income per person of working age, W is the number of people of working age, b is the average benefit for person of old age and O is the number of people of old age. Rearranging, we see that the tax rate required to keep the system in balance, $t = (b/y)(O/W)$ is directly proportional to the old age dependency ratio.

Canada, the United States, Brazil, Argentina, Chile and Australia, among others. The only countries of the world that will avoid significant aging in the next few decades are found in Sub-Saharan Africa and parts of the Middle East.

Short-run Influences on Population Aging

Populations change over time. Arrivals come in the form of births and immigrants. Departures go in the form of deaths and emigrants. Understanding how such changes influence population age structure in the short-term is straight forward. If the population has a mean age A_p , then any arrivals that occur before this mean age will make the population younger and any arrivals that occur after this mean age will make the population older. Departures do the same thing in reverse.

Additional births will always make a population younger. Since births arrive at age zero, they will always be less than the mean age of the population.

Additional deaths have an ambiguous effect, depending on the age at which they occur. Deaths of the young, for example infant mortality, make the population older. While deaths of the old make a population younger. Historical mortality decline has largely consisted in saving the lives of the young and so over the last century or two, mortality decline has – contrary to conventional wisdom – made populations younger. More recently, however, there have been substantial increases in adult survival, making mortality decline a contributor to population aging.

Migration occurs at all ages but is concentrated in the early adult years, usually less than the mean age of the population. Thus, in the short-term immigration tends to make populations younger.

Preston et al. (1989) formalized these ideas. They showed that the rate of change in the mean age of the population (A_p) is

$$\frac{d}{dt} A_p(t) = 1 - b(A_p - 0) - d(A_d - A_p) - i(A_p - A_i) - o(A_o - A_p), \quad (1)$$

where b , d , i and o are respectively the crude rates of birth, death, in-migration and out-migration and the subscripts on A refer to the respective mean ages.

The intuition of this expression is that a population with no births, no deaths and no migrants will simply age like an individual, at a rate of 1 year of age per year of time. Births will counteract this force, with the contribution of each birth being greater, the older the population is. Deaths can make the population older or younger, depending on whether the average age at death is greater than or less than the mean age of the population, and immigrants act in the same way.

The important lesson is that in the absence of entrances and exits, a population ages just like an individual, getting one year older for each year of time that passes. Entrances of the young rejuvenate a population, as do exits of the old. In this sense, population dynamics are like a group of people riding an escalator. If no one new steps on to the escalator, the group of passengers will rise higher. Increasing the rate of entrances will shift the group lower. Extending the length of the escalator will let the group rise higher.

Long-term Influences on Population Aging

The immediate effects of a new arrival or departure are easy to understand. Over time, however, each new arrival eventually gets older. Additionally, each new arrival has the potential to generate more new arrivals in the form of births. To understand the longer term effects we must think not only of stocks (the current age structure) and flows (new arrivals or departures) but also about the evolution of the population over time.

The main tool used by demographers to understand long-term population dynamics are models of “stable populations”. A stable population experiences unchanging age-schedules of fertility and mortality and has no in- or out-migration. The remarkable property of a population subject to fixed age-specific fertility and mortality rates is that its age structure will converge over time to a unique stable age structure. The stable population may change in absolute size but, eventually, the proportions of people at each age group do not change. We can describe the stable age structure in a mathematical formula for $c(x)$ the proportion of the population aged x ,

$$c(x) = b l(x) e^{-rx} \quad (2)$$

where r is the growth rate of the population, $l(x)$ is the proportion surviving from birth to age x and b is the birth rate of the stable population.³ To understand this formula, take a simple example of a growing population in which everyone survives to some age. In this case, the number of people of a given age x will equal the number born x years ago. Thus, moving up the age pyramid will reduce the fraction of the population at the same rate r at which the birth cohorts have grown. The $l(x)$ term generalizes this for an arbitrary pattern of survival by age. The b term simply converts the relative numbers to proportions.

Some mathematics is required to prove that the stable age structure is determined only by the rates of fertility and mortality and is uninfluenced by the historical age structure of a population (Sharpe and Lotka 1911). Intuitively, however, this property of forgetting past age structures is not hard to understand. What happens is that peaks and troughs in the history of a population are smoothed out with each successive generation, because births and deaths happen to different people at a range of ages (Arthur 1982). Thus, an unusual feature like the 1967 year of the “fire horse” in Japan in which fewer children were born, shows up at first as a notch in the age structure. When this notch is echoed a generation later, it is not so sharply defined, because the notch babies do not themselves decide to have children all at the same time. The “echo” of the notch is thus a more gentle dip. A generation later, the dip is even smoother and the age structure continues to smooth until all traces of the initial feature are lost.

Stable populations are fictions but convenient ones. They are easy to analyze mathematically and often bear a reasonable resemblance to real population age structures. The logic of the stable age structure applies to any population that has seen fairly steady growth or decline in the number of births and more-or-less constant mortality patterns.

There are three qualitatively different shapes of stable age pyramids (see Fig. 1.3). In a rapidly grow-

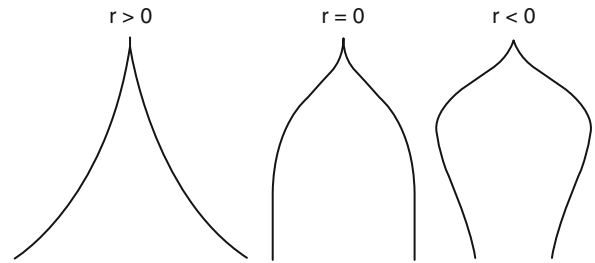


Fig. 1.3 Illustrative shapes of stable age pyramids in growing, stationary and shrinking stable populations. Compare with observed aged pyramids in Fig. 1.1. r is the growth rate of the stable population

ing population, the age pyramid will be shaped rather like the silhouette of a pine tree, a wide base exponentially shrinking as one moves up the age pyramid to earlier birth cohorts. In a stationary population, the shape will be roughly like a hay stack, with relatively constant numbers up to age 50 or so, when mortality starts to have a large effect. In a shrinking population, the pyramid will have a bulging “barrel” or “cobra-head” shape, in which the size of age groups grow as we move back in time and up the age pyramid until about age 50 or so when mortality starts to shrink the age groups in size once again.

The three stylized shapes are shown in Fig. 1.3 and by flipping to the page back the reader can see that Pakistan, New Zealand and Japan have a rough correspondence with these three stylized shapes. The stable population model is also useful for what it reveals about departures from the stylized stable age structure. For example, we can see that the base of the age pyramid in Pakistan does not grow as quickly from below age 20 as it does from ages 20 to 40, corresponding to an observable decline in fertility in recent decades. In New Zealand we see the baby boom and its echo. In Japan we see the dramatic decline in fertility after World War II and the echo of this decline in recent decades.

The Influence of Mortality and Fertility on Stable Age Structures

One use of stable population theory is to provide an understanding of the role that mortality and fertility play in determining a stable age structure. Using mathematics, we can answer a question like what drives the

³ This formula follows from a population experiencing exponentially growing (or shrinking) counts of births. Let $N(x)$ denote the number of persons aged x . If B people were born this year, then Be^{-rx} were born x years ago, of which a fraction $l(x)$ survives. Thus $N(x) = Be^{-rx}l(x)$. Dividing both sides by the total population gives the equation above.

differences in age structure seen between real populations: fertility or mortality?

The impact of fertility level on age structure can be seen by comparing two populations with the same survival schedule $l(x)$ but different growth rates r and r^* . A simple way to do this is to look at the proportional change in the fractions at each age per unit change in r (Lotka 1939; Keyfitz 1985). Differentiating $\log c(x)$ with respect to r , one obtains

$$\frac{d \log c(x)}{dr} = A_p - x \quad (3)$$

This tells us that an increase in the growth rate will cause young age groups to increase in relative size and old age groups to shrink in relative size, pivoting around the mean age (Preston et al. 2001).

We can also use stable population theory to assess the change in the mean age caused by a change in the growth rate. By differentiating the mean with respect to the growth rate we obtain

$$\frac{dA_p}{dr} = -\sigma_r^2 \quad (4)$$

where σ_r^2 is the variance in the stable age distribution.⁴ Typical values of the variance range from about 300 in rapidly growing populations to about 500 in roughly stationary populations (Keyfitz and Flieger 1968). Thus, older populations are themselves more susceptible to aging.

To illustrate, we take the case of a rapidly growing population, Honduras circa 1965, when the implied stable population had a mean age of 21.6 years. We can ask how much older this mean age would be in the stationary population with the same mortality – that is, if the stable growth rate were zero rather than the observed value of 3.4 per cent. The variance of the population is about 400.⁵ This implies a change of

$(0.034)(400) = 13.6$ years, from a mean age of 21.6 to a mean age of 35.2 years, close to the exact value of 35.9 years.

The analysis of mortality changes can be more complicated than changes in fertility, depending on the ages at which deaths occur. Take a simple case, with the same number of births every year and everyone dying at the same age. Here, the mean age of the population will be equal to half the length of life. Increasing longevity by 1 year will increase the mean age of the population by half a year. In more realistic examples, mortality changes occur across many ages. In general, mortality declines at older ages will make the population older but by less than the simple case above. Declines at younger ages will make the population younger.

Figure 1.4 summarizes the relationships between fertility, mortality and the mean age of the stable population. The contour lines show the combinations of fertility and mortality that produce the same mean ages. To see the effect of mortality change, holding fertility constant, move horizontally. To see the effect of fertility change, holding mortality constant, move vertically. The effect of lowering fertility is always to make the population older, no matter what the level of mortality. The tendency for improvements in survival to make populations younger, when mortality is high, can be seen. For example, at a TFR of 4, the mean age falls from 28 to about 26 as life expectancy increases from 40 to 65. Once life expectancy reaches about 65, however, further mortality decline makes populations older. Finally, we see that at lower fertility levels, the contours are spaced much more closely together, showing that a small change in fertility or mortality can have large effects on the population age structure.

The paths of India from 1900 to 2050 and Sweden from 1800 to 2050 are shown on the contour plot. We see in both cases a demographic transition making the population younger in its early stages but then followed by considerable aging. Developing countries making the transition in recent decades have considerably younger populations than populations in the historical transitions. However, the age structure at the end of the transition is similar, because the forecasts expect there to be similar demographic rates and all traces of the past age structure are lost as the population evolves over time.

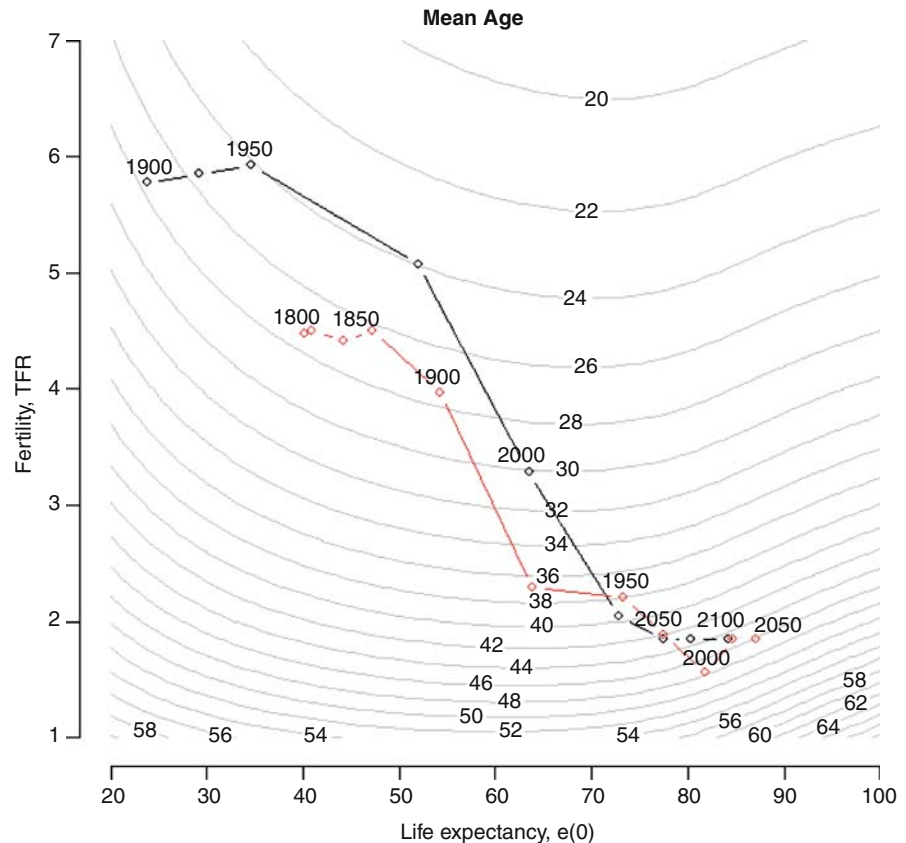
⁴ For a related result, see Keyfitz (1985). To derive, differentiate the expression for the mean age of the stable population, recognizing that the variance is the difference between the mean square and square of the mean.

⁵ This is the average of the variances of the stable and stationary populations.

Fig. 1.4 Mean ages of stable populations by fertility level and life expectancy at birth.

Time paths of demographic rates for India, 1900–2100, in black and Sweden 1800–2050, in red

Source: United Nations (2006), Bhat (1989) and United Nations (2004). Stable populations calculated with survival schedules using the Lee-Carter (1992) model of mortality change with age-specific change profile from Sweden, 1900–2000



Population Aging Over the Course of a Demographic Transition

Having considered how demographic rates influence age structure in the short- and long-term, we are now ready to look at the dynamics of populations that undergo changing demographic rates. Specifically, we look at the demographic transition from high to low mortality and from high to low fertility.

To motivate our discussion we will consider the case of Vietnam, a country that is going through a rapid demographic transition. We see in the accompanying Fig. 1.5, which shows the female population of Vietnam plotted for the years 1950–2075. In the first panel from 1950 we see the age structure created by the near zero growth history of Vietnam of the first half of the 20th century, when high mortality offset high fertility. Only in the unusually large youngest age group can we see the signs of impending demographic change – in this case, likely to be an increase in infant survival.

A generation later in 1975 we see that Vietnam had entered a time of rapid population growth. The number of surviving infants has more than doubled in only a generations time and the age pyramid has a mixed form: above age 25 or so, the population has the form of a stationary population and below age 25 it has the form of a rapidly growing population. The result is an extremely young population.

By 2000, the population is still young but fertility decline has begun in earnest, apparently around 1990. The population is still growing, especially in the adult ages but aging has begun.

By 2025 the age structure looks like the stationary form we saw for New Zealand.

The UN forecasts assume that fertility will continue to fall to below – replacement levels. The result can be seen in 2050, where each new birth cohort is smaller than the last. The only trace of the high growth years is the large numbers over age 55, the last cohorts born before fertility decline began in earnest. Finally, by 2075, the age pyramid has assumed a

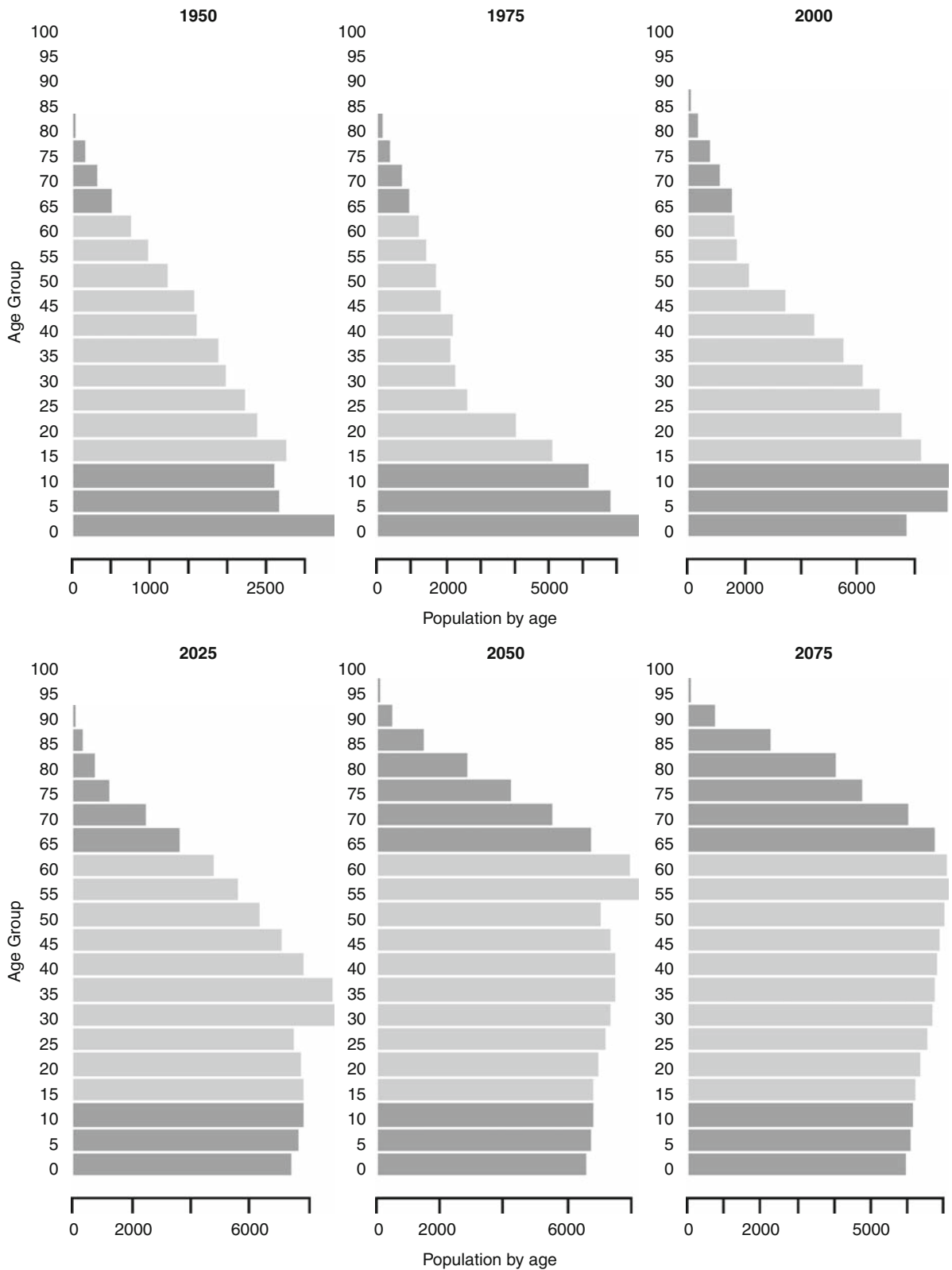


Fig. 1.5 The changing age structure of Vietnam over the course of the demographic transition, females only
 Source: United Nations (2006) and author's projection. (Females only)

nearly stable profile. The Vietnamese population has completed the demographic transition and has aged. (The forecasts here assume constant rates after 2050. Most would predict continued change, with further increases in longevity.)

From the point of view of age structure, we see that the population is at its youngest around 1975 and its oldest after about 2050. The dependency ratio (including children) is most advantageous from about 2010 to about 2030, the so-called demographic dividend that provides a period in which a large number of workers need only support a small number of young and old dependents, allowing increased savings and investment (Bloom et al. 2003). All of this change will occur within the lifetime of Vietnamese born today.

The total dependency ratio, the sum of old-age and youth-dependency ratios, is about the same before and after the demographic transition. But whereas in 1950 the young made up virtually all dependents, by 2050 the old outnumber the young. The total dependency ratio can be misleading in terms of monetary costs, since the elderly can consume much, much more than the young, particularly if health costs are high.

What is notable about the changing demography of Vietnam is that after about 2000 there will be a time of relatively low dependency but that this will last only a few decades before aging raises new challenges. Furthermore, because of the bulge created by the quick shift from high to low fertility, the demographic dividend and the elderly bulge are both larger than they will be in slower transitioning countries (Li and Tuljapurkar 2005).

The transition seen by Vietnam is similar to many but not all, developing countries. As we saw, most of the world's national populations will age in the next several decades. An exception is Sub-Saharan Africa, where fertility is not yet falling quickly and the impact of AIDS creates mortality-driven population dynamics. AIDS mortality can create a "chimney"-like age structure, in which the population from 0 to age 30 or so resembles the barrel-shape age structure of stationary populations but then a long narrow column of survivors continues to older ages. In such populations the mean ages can be very young but since young adult ages are no guarantee of independence in AIDS-stricken populations, the age structure is less important than the proportion of the population that is burdened with disease.

Migration and Population Aging

Countries facing population aging often consider increases in immigration. In the short-term, migration can make a population younger or older, depending on the age of new arrivals relative to the average resident. (A migrant aged "zero" has the same effect as a new birth.) But migrants themselves age. Thus a migrant who joins a population at age 20 and exits a population (either through death or out-migration) at age 80 is, on average, 50 years-old during the time he or she is in the receiving population. This effective age of 50 is likely to be considerably older than the average age of the population, even though the age of entrance is likely to be considerably less than the average age of the population. This is the reason that a steady stream of migrants almost always makes a population younger in the short-term but older in the long-term, as compared to the age structure in the absence of migrants. See Espenshade et al. (1982) and Schmertmann (1992).

There are several possible exceptions to this: the first is if the average age of the population is so old, perhaps because of low fertility, that its mean age is actually higher than the effective mean age of the migrants (Schmertmann 1992). The second case is if ever-increasing numbers of migrants are added (United Nations 2001; Blanchet 1989). In this case, the effective age of the migrant stream is made younger by weighting the ages soon after arrival, where there are more people. Finally, migration could make a population younger by raising the birth rate of the receiving population. This has historically not been a major factor, since the birth rates of migrants have tended to converge to that of natives after a generation or so but it could happen in the future.

In contrast to the long-term, the short-term effects of migration can be quite rejuvenatory. A classic example of this is Vienna toward the end of the 20th century (Lutz et al. 2003). Vienna had extremely low fertility prior to World War II and relatively few in-migrants after the war. This led to one of the oldest urban populations in the world in the 1970s. By 2000, however, the fall of the Iron Curtain and the influx of young from the Austrian countryside actually made Vienna younger than it was a generation earlier – despite not a single year of fertility in which the TFR was above replacement. Forecasts of Vienna's population predict that aging will return in the future but new influxes of migrants could postpone this.

Adapting to Population Aging

When rapid population growth comes to an end, populations age. This is an inescapable consequence of population arithmetic. The social and economic consequences of aging, however, are open. As people live longer and have fewer children later in life, their own life cycle changes in many ways. Some of these changes counteract the economic effects of population aging.

Take for example, declines in fertility, which free up years of life spent raising children, enabling more women to enter the market workforce. In the United States, for example, the per cent of women over age 16 in the labor force increased from 43 per cent in 1970 to 60 per cent in 1999. (U.S. Department of Labor 2005).

On the other hand, lower fertility and longer life also encourage longer periods of economic youth dependency, mostly because the pay-offs to education increase. In the short-term this is a dilemma, as societies must increase schooling even as the number of tax payers may not increase. But in the longer term, higher education could increase productivity across the life cycle and counteract the effects of a later start to working life.

Increased longevity can also, at least in theory, lead to a greater pool of savings available for capital investment. Because workers expect to be retired for more years, they need larger stocks of capital at the time of retirement (Lee and Goldstein 2003). Increased capital can also be a source of higher productivity.

Longer life in and of itself is not a source of concern as long as the age of elderly inactivity moves together with the length of life. Take a hypothetical stationary population in which everyone starts work at 15, retires at 65 and lives to be 75. Compare that to another population in which work begins at the same age but everyone lives to 85. In the first population, the OADR = 10/50 and in the second, if retirement is still at age 65, it has doubled to 20/50. Adjusting the age at retirement, this can easily be remedied. Increasing retirement proportionally – by 8 years – would keep the dependency ratio unchanged. Increasing the age at retirement by an amount equal to the increase in longevity – 10 years – would actually reduce the Old Age Dependency Ratio to 10/60.

If, on the other hand, longer life is accompanied by longer periods of frailty and disability, population

aging will be a considerably larger challenge. Retirement ages would not be able to be increased enough to counterbalance demographic aging. What matters in the long-term is not the ratio of people of different particular ages but rather the ratio of those who are in good health and who are able to be productive and those who are in poorer health and who need assistance. So far, research suggests that healthy life expectancy is keeping pace with increases in longevity (Mathers et al. 2001). But, so far, extensions in work life have not matched the increase in healthy life expectancy.

The intertwined nature of fertility, longevity, human capital accumulation and productive economic work mean again that simple metrics like population age structure are not going to capture the full social and economic effects of demographic change. One approach for reassessing population aging is to measure the relative age of a population not by how far its members are from birth but rather how many years separate them from death (Ryder 1975). According to this way of thinking, a population that, on average, has many years to live is for all practical purposes “younger” than a population that has fewer years to live. Sanderson and Scherbov (2005) showed that some “aging” populations will actually become younger in the coming decades – if the years until death are a measure of youthfulness.

Figure 1.6 shows a contour plot of average remaining life expectancy (E) of stable populations by different levels of fertility and mortality. The contours show that higher fertility and higher longevity both make populations younger in the sense that the average remaining life expectancy increases. Over the course of the demographic transition, E increases from the mid-20s to about 40 but this rise is not steady. Most of this change occurs as mortality falls early in the transition, because the population age structure gets younger at the same time that longevity is increasing. In the middle of the transition – when fertility is falling – the average remaining life expectancy falls again, because the age structure shifts to older ages faster than life expectancy at these ages rises. As fertility declines slow, then mortality decline again dominates and E begins to increase once more.

The trade-offs between fertility and mortality that keep the average remaining life expectancy constant can be seen in the slope of the contour lines at any given point. For example, the contour line in a stable

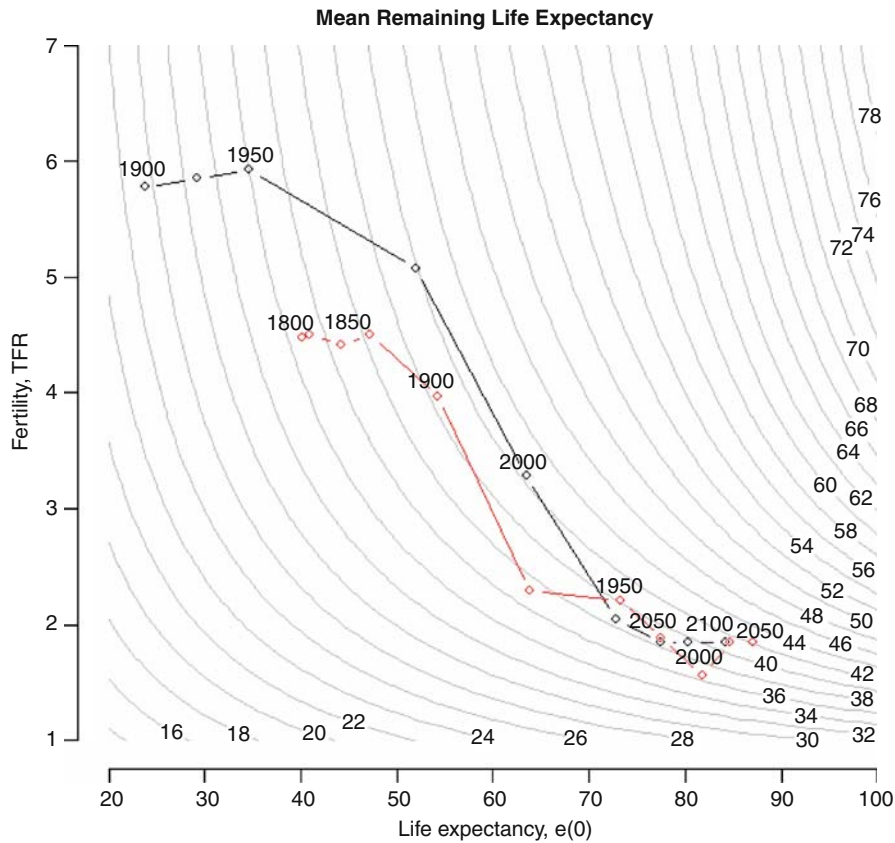


Fig. 1.6 Average expectancy (E) in stable populations by fertility level and life expectancy at birth. Time paths of demographic rates for India, 1900–2100, in black and Sweden 1800–2050, in red. Fertility declines always make the population “older,” in the sense of less of average remaining years of

life expectancy, whereas mortality declines always make the population “younger”. This contrasts with the mean age of the population, for which mortality declines of the elderly make the population older

Sources and methods: See Fig. 1.4.

population with a TFR of 2 and life expectancy at birth of 80 has a slope of about $1/20$. This means that a one-tenth of a child fall in the TFR can be offset by a 2-year increase in life expectancy at birth. The lower the fertility, the bigger the increase in life expectancy is needed to offset further fertility declines.

As an economic problem, aging from mortality decline is fundamentally different from aging due to fertility decline (Lee 2003). Both increase the proportion of the elderly and the average age of the population but mortality decline is accompanied by the improving health and functional status of the elderly, whereas fertility decline ages the population without a corresponding increase in the ability of individuals to work longer. The kinds of increases in late-life activity that can enable a population to adapt to population aging are possible when mortality declines but a hardship if fertility declines.

Nearly all populations around the world will age in the coming century. The largest and most challenging cause of population aging is due to the fact that the demographic transition is expected to complete its course throughout the developing world, and a new regime of near or sub-replacement fertility will become the norm. Aging will also occur because of increased longevity but this can be adapted to, in large part by increasing the length of economically active lives.

References

- Arthur WB (1982) The ergodic theorems of demography: A simple proof. *Demography* 19(4):439–445
- Bhat PNM (1989) Mortality and fertility in India. In: Dyson T (ed) *India's historical demography*, Curzon Press, London, pp 73–118

- Blanchet D (1989) Regulating the age structure of a population through migration. *Population: An English Selection* 44(1):23–37
- Bloom DE, Canning David D, Sevilla J (2003) The demographic dividend: A new perspective on the economic consequences of population change, *Population matters monograph MR-1274*, RAND, Santa Monica
- Chu CYC (1997) Age distribution dynamics and aging indexes. *Demography* (34):551–563
- Espenshade TJ, Bouvier LF, Arthur WB (1982) Immigration and the stable population model. *Demography* 19(1):125–133
- Keyfitz N (1973) Individual mobility in a stationary population. *Popul Stud* 27(2):335–352
- Keyfitz N (1985) *Applied mathematical demography*, 2nd edn. Springer, New York
- Keyfitz N, Flieger W (1968) *World population: An analysis of vital data*. University of Chicago Press, Chicago
- Kinsella K, Velkoff VA (2001) *An aging world: 2001*. U.S. Census Bureau, Washington, DC
- Lee RD (2003) The demographic transition: Three centuries of fundamental change. *J Econ Perspect* 17(4):167–190
- Lee RD (1994) The formal demography of population aging, transfers and the economic life cycle. In: Martin L, Preston S (eds) *The demography of aging*, National Academy Press, New York, pp. 8–49
- Lee RD, Carter LR (1992) Modeling and forecasting US mortality. *J Am Stat Assoc* 87(419):659–671
- Li N, Tuljapurkar S (2005) A formal model of age-structural transitions, In: Tuljapurkar S et al. (eds) *Population, resources and development, riding the age waves— volume 1*, Springer: Dordrecht, Netherlands, pp 91–105
- Livi Bacci M (2001) Too few children and too much family. *Daedalus* 2:139–156
- Lotka AJ (1939) *Théorie analytique des associations biologiques*. Part. II. *Analyse Démographique avec Application Particulière à l'Espèce Humaine*. Number 780 in *Actualités Scientifiques et Industrielles*. Hermann et Cie
- Lutz W, Scherbov S, Hanika A (2003) Vienna: a city beyond aging – revisited and revised. *Vienna Yearbook of Population Research* 1:181–195
- Mathers CD, Sadana R, Salomon JA, Murray CJL, Lopez AD (2001) Healthy life expectancy in 191 countries, 1999. *Lancet* 357(9269):1685–1691
- Preston SH, Heuveline P, Guillot M (2001) *Demography: Measuring and modeling population processes*. Blackwell, New York
- Preston SH, Himes C, Eggers M (1989) Demographic conditions responsible for population aging. *Demography* 26(4):691–704
- Ryder NB (1975) Notes on stationary populations. *Popul Index* 41(1):3–28
- Sanderson WC, Scherbov S (2005) Average remaining lifetimes can increase as human populations age. *Nature* 435(7043):811–813
- Schmertmann CP (1992) Immigrant's ages and the structure of stationary populations with below-replacement fertility. *Demography* 29(4):595–612
- Sharpe FR, Lotka AJ (1911) A problem in age-distribution. *Philos Mag* 21:435–438
- United Nations (2001) *Replacement migration: Is it a solution to declining and ageing populations?* United Nations, New York
- United Nations (2004) *World population to 2300*. United Nations: New York
- United Nations (2006) *World population prospects: The 2006 revision, population database*
- U.S. Department of Labor (2005) *Women in the labor force: A databook*. Number 985 in Report. Washington, DC: U.S. Department of Labor
- Vaupel JW, Loichinger E (2006) Redistributing work in aging Europe. *Science* 312(5782):1911–1913

Chapter 2

Data Sources for Studying Aging

Markus H. Schafer and Kenneth F. Ferraro

Introduction

The demographic study of aging in comparative context covers wide intellectual and disciplinary ground. Aging involves social, behavioral and biological processes; thus, scholars studying aging investigate issues ranging from genetic contributions to chronic disease susceptibility (Olshansky et al. 2005) to the effects of economic growth on elders' living arrangements (McGarry and Schoeni 2000). Aging involves many multifaceted processes that have implications at the microlevel for the analysis of individual lives and at the macrolevel for the analysis of population and historical change.

Interest in studying aging in a global context has attracted considerable interest in recent years and has become particularly relevant in an era of unprecedented international demographic change (Wilson 2001). The goal of this chapter is to aid researchers interested in the international study of aging by highlighting key issues and developments in this growing field and by drawing attention to the wealth of data currently available for analysis. To this end, the chapter is organized in three sections.

Research Design. Distinctions between cross-sectional and longitudinal research designs are important for scientific progress in the study of aging. In addition, the value of comparative research is articulated.

Data Resources. Data for the comparative study of aging are rapidly accumulating and we identify resources for making use of them. We also elucidate some of the special challenges to conducting comparative research on aging.

Enhancing Data with Record Linkages. Comparative, demographic research on aging is valuable for scientific advancement, but there are special issues regarding its conduct. In the concluding section of this chapter, we examine two of the emerging issues in this genre of research: use of biomarkers and multi-level approaches to the analysis of contextual data.

Research Design

Cross-Sectional, Repeated Cross-Sectional and Longitudinal Panel Studies

Archival data for the study of aging in comparative context are generally available in one of three main research designs: cross-sectional, repeated cross-sectional and longitudinal panel designs. Cross-sectional studies involve collecting data from subjects at one point in time. The idea behind cross-sectional research is to capture sufficient inter-individual variability so that relationships between variables can be assessed. The design is very useful for comparing distinct groups or nations and is clearly appropriate for investigating new topics of inquiry. Many research issues, especially the development of new measures, are best undertaken in cross-sectional designs.

There are many merits of cross-sectional designs that make them attractive to investigators, especially

M. H. Schafer (✉)
Center on Aging and the Life Course
Purdue University
Young Hall, 155 S. Grant Street
West Lafayette
IN 47907-2014, USA
E-mail: mhschafe@purdue.edu

their relatively efficient and inexpensive completion. Moreover, one does not need to follow subjects who may die or become untraceable. Cross-sectional studies may be wholly appropriate when one's analytic goal is to investigate macro-level phenomena, such as population structures or other broad comparisons between nations or regions. Although cross-sectional designs are typically not thought of as capable of measuring change, some researchers use retrospective questions to assess change. Though relatively efficient and inexpensive, concerns about retrospective questioning and population selection are often cited as reasons for preferring other designs that assess change from distinct measurement occasions.

The idea of this analysis can be extended over time so that the same data are collected in a series of cross-sectional surveys, each using a different set of respondents. This design is known as repeated cross-sectional research and has been used effectively by demographers for decades. Perhaps the best example of repeated cross-sectional data is the use of census information. The United States Census Bureau's International Data Base has general demographic data available for all 227 independent states, dependencies and areas of special sovereignty in the world (U.S. Census Bureau 2006). Comparative information that is available annually includes population pyramids as well as population projections to the year 2050. Thus, these types of data provide invaluable information on population dynamics and historical change. These data may also provide unique insight into how individual aging is related to population aging – analyses that can contribute to middle-range theories of aging. These designs permit estimation of cohort and social change, thereby providing insight into the intersection of history and biography.

Longitudinal panel designs also enable investigators to analyse change but it is change in the unit that is observed. As many scholars contend, longitudinal panel data provide the richest opportunity for studying aging (Alwin and Campbell 2001). The ultimate benefit of these data is that they allow researchers to assess intra-individual change. Cross-sectional studies are generally limited to measuring independent and dependent variables at one point in time and inferring age changes from *age differences*. Repeated cross-sectional studies permit analyses of change among cohorts (aggregates based on time of birth), which is invaluable for the study of how populations and cohorts change. Longi-

tudinal panel studies are very attractive to investigators because they can track changes in the unit of observation (e.g., people) to observe *age changes*. In addition, data from one point in time can be used prospectively to predict future outcomes, thereby allowing researchers to address one of the main criteria for documenting causality – temporal order (a presumed cause must precede or be simultaneous with the supposed effect).

In the field of social gerontology, repeated cross-sectional designs continue to be a modest portion of the quantitative research on aging but longitudinal panel designs have grown appreciably during the past four decades (Ferraro and Kelley-Moore 2003). In turn, this means that the percentage of cross-sectional articles published in the most prestigious outlets is declining, albeit at a modest rate.

Why has longitudinal research on aging increased during the past half century? Ferraro and Kelley-Moore (2003) identified four primary reasons. First, a paradigm shift has occurred: no longer is the chief interest of scholars to study older people but the processes of how people get older. Second, there has been a significant increase in federal funds for large longitudinal studies, particularly from the U.S. Department of Labor and from the National Institute of Aging. Third, not only are there more and richer longitudinal data but these data have become more accessible to a greater number of scholars. Fourth, advances in statistical computing have made the analyses of these data more powerful, and in turn, more compelling.

These developments in longitudinal research are highlighted by several notable American studies from the past 20 years with a focus on aging. Both the Longitudinal Study of Aging (LSOA) and the Health and Retirement Survey (HRS) have been landmark studies in the United States and have also served as influential models for longitudinal research in other nations. The LSOA began in 1984 and featured follow-ups in 1986, 1988 and 1990 under the auspices of the National Center for Health Statistics. The LSOA was primarily focused on the health, living arrangements and patterns of the health service utilization of Americans aged 70 and over. One of the pioneering features of the LSOA was that information gained from the surveys was linked to official records, including Medicare files, the National Death Index and multiple cause-of-death records. There is also a LSOA II but it has not yet equaled the status of the original LSOA for research on aging and health.

The Health and Retirement Survey began in 1992 and is another remarkable national longitudinal study. Although its original foci were the retirement transition and the relationship between wealth and health, it has evolved to incorporate many modules and features to study a wide array of topics. For example, the HRS now gathers data on loneliness and social support, occupational health and cognition.

Drawing on the design of these impressive longitudinal studies, researchers from other nations have developed similarly notable projects. For example, the English Longitudinal Study on Ageing (ELSA) was purposely modeled after the HRS. Beginning as a follow-up of respondents from the Health Survey for England (1998, 1999, 2001), respondents who were 50 years or older were reinterviewed during 2002–2003 and plans are underway for bi-yearly follow-ups hereafter. Researchers from the Nihon University Japanese Longitudinal Study of Aging (NUJLSOA) have likewise designed their nationally representative study of Japanese 65 and older after the American HRS and LSOA. Thus, these data sets permit both cross-sectional and longitudinal comparisons across nations, although one must be willing to consider whether some differences in survey administration are consequential to international comparisons.

National and International Studies: Serendipitous or Purposive?

Beyond the cross-sectional/longitudinal distinction, there are many approaches to the demographic study of aging in an international context. Scholars from fields such as demography, anthropology, economics and sociology may use data from individuals, regions, nations, or some combination thereof. Moreover, some international or comparative research occurs somewhat serendipitously because of the availability of archival comparative data. Other projects are comparative by design and typically involve more calibration of measures and sampling procedures.

International demographic research involves studying another country to better understand the dialectic between aging and both population structures and dynamics. Some research is classified as “international” primarily because the nation under investigation is distinct from the investigator’s nation of residence.

Comparative research; however, involves combining data from more than one nation with the intention of making systematic comparisons *between* countries or regions. This type of research may also be described as cross-national or cross-cultural.

Figure 2.1 displays a cross-classification of the three main types of research design by whether the study is national or comparative (international). Each cell in the figure represents a study design that may be wholly appropriate for selected research questions and we provide an example of each design. As noted above, repeated cross-sectional and longitudinal panel designs permit assessment of change, cohort and intra-individual change, respectively. With comparative data, these designs permit evaluation of cohort and intra-individual change in more than one nation as well as systematic comparison of changes across the nations under investigation.

Coinciding with the 2002 United Nations Second World Assembly on Ageing, which issued a formal statement on the necessity of studying international aging, the *Journal of Social Issues* devoted an issue to the topic of wellbeing among older people around the world (Antonucci et al. 2002). In this issue, Jackson (2002) argued for a renewed effort in developing conceptual models to understand the structural, social, psychological, biological and genetic influences on life-course development. To extend the current state of understanding, Jackson (2002) identified three approaches for comparative research on aging.

Descriptive Comparative Research. This research approach examines similarities and differences either within or across specified societies. For instance, researchers might inquire as to whether an American-derived model of successful aging generalizes to an Australian population (Andrews et al. 2002).

Comparative Outcomes Research. This approach entails a more specific examination of whether processes or structures differ between nations. For instance, structural or policy characteristics of one country may influence its inhabitants’ aging experiences in a way that differs from another country. This approach also frequently involves testing interaction effects between nations and variables in predicting an outcome (or conducting subsample analyses and testing for differences in regression coefficients across nations). For example, de Jong Gierveld and Perlman (2006) compared a series of hierarchical models predicting the duration of non-kin relationships among

Fig. 2.1 Research designs and examples of studies for national and/or comparative research

	National	Comparative (International)
Cross-Sectional	Social Environment and Biomarkers of Aging Study (SEBAS) in Taiwan (Weinstein and Goldman 2000) ^a	World Health Organization Collaborative Study on Social and Health Aspects of Aging in Bahrain, Egypt, Jordan, and Tunisia (Andrews 1993) ^a
Repeated Cross-Sectional	German Social Survey (Zentralarchiv fuer Empirische Sozialforschung and Zentrum fuer Umfragen, Methoden und Analysen 1998) ^a	International Data Base (U.S. Census Bureau 2006) ^b
Longitudinal Panel	Australian [Adelaide] Longitudinal Survey of Aging (Andrews & Myers, 1999) ^a	Survey of Health, Aging, and Retirement in Europe (SHARE) (Borsch-Supan et al. 2005) ^c

^a Data available through ICPSR website (<http://www.icpsr.umich.edu/index.html>).

^b Data available through U.S. Census Bureau website (<http://www.census.gov/ipc/www/idbnew.html>).

^c Data available through SHARE website (<http://www.share-project.org/>).

samples of Dutch and American older adults. When comparing the regression coefficients across these two samples, the authors found that factors such as social network homogeneity, city residence and divorce predicted the duration of nonkin relationships differently in the two nations.

Comparative Processes Research. The third approach is concerned with how differences within a particular society compare to differences between societies. For example, Antonucci and Jackson (1990) compared life course differences in social reciprocity among Black and White Americans with French individuals, finding unique processes at work for each of these three groups. Comparing countries is desirable for empirical generalizations but one must be cautious about obscuring heterogeneity within a particular

nation (Hermans and Kempen 1998; Markides et al. 1990). This *comparative process* model must consider various influences such as culture, early-life factors, immigration and acculturation (Jackson 2002; Jackson and Antonucci 1994).

To Jackson, all three approaches are valid and valuable. His hope, however, is that researchers will prioritize the third approach because it recognizes the increasing mobility and intermixing of people-groups in a globalizing world, not only in North America but in Europe and Asia as well (Hugo 2006; King et al. 1998; Rogers and Raymer 2001; Warnes 2001). As American scholars attempt to compare aging trends and phenomena in their homeland to other societies, they would be wise to bear in mind the unique experiences of ethnic groups such as Arab

Americans (Ajrouch 2005) and Latin Americans (Markides et al. 1997).

Exemplars of Comparative Research

Many noteworthy comparative studies of aging from a demographic perspective have been completed over the past two decades. We consider several of these studies to illustrate the value of comparative research and articulate some of the special challenges faced by scholars interested in comparative research on aging.

The increasing economic cooperation between European countries has helped facilitate a number of cross-national studies designed to uncover age-related variations across the continent. The Luxembourg Income Study (LIS) is one such model of cooperation. Begun in 1983, the LIS has worked to harmonize household surveys from various nations featuring topics on employment, occupational conditions, investment in education and migration. Though the LIS spans four continents, 24 of the 30 nations comprising the project are European (the other six are Australia, Canada, Israel, Mexico, Taiwan and the United States). The LIS was not designed to focus entirely on the study of aging, yet many researchers have used it to investigate economic issues linked to aging, such as the effects of income on mortality among older persons (Lobmayer and Wilkinson 2000), the implications of redistributive income support for older individuals (Shaver 1998) and poverty rates among older people in relation to other constituents of developed nations (Brady 2004). A notable feature of the LIS is that its cross-national design is optimal for analyzing economic policy issues among different nations.

Studying economic and policy issues related to population aging is an intriguing arena of inquiry for scholars interested in public policies and aging. Whereas public and private involvement in policy-making varies across countries, making comparisons among these different nations provides an important perspective of the effectiveness of certain policies. This approach is exemplified by the Cross-National Equivalent File (CNEF), which is an effort of Cornell University's Department of Policy Analysis and Management to merge panel studies from four nations – Canada, Germany, Great Britain and the United States. The CNEF adds standardized variables, which are

equivalent across the four nations' panel studies. This effort builds on LIS but improves upon it by featuring a longitudinal design. The data set is relatively new but exciting research related to aging is already beginning to emerge. For instance, an analysis of the economic stability of widows across the four countries was published in Burkhauser et al. (2005) and the potential for further compelling research with these data is quite promising.

Other studies, such as the Survey of Health, Ageing and Retirement in Europe (SHARE), have been designed specifically to address aging issues. With about 27,000 participants from 11 European nations at the 2004 baseline, this research project has much promise. Given the institutional change underway across Europe, including pension, health care and labor market reform, the SHARE investigators see the continent as a "natural laboratory" for investigating how various policies affect the daily lives of older persons and vice versa (Borsch-Supan et al. 2005: 15). Plans are already underway for the SHARE to include multiple waves.

Another milestone in cross-national collaboration is the emergence of comparative data from various developing countries. Demographic change may progress very differently in such nations as compared to relatively developed countries. An exemplar of this type of research in international demography is the Survey on Health, Well-Being and Aging in Latin America and the Caribbean (SABE). With support from the Pan American Health Organization, the National Institute on Aging and the Center for Demography and Ecology at the University of Wisconsin, a team of researchers are investigating a host of age-related issues in Argentina, Barbados, Brazil, Chile, Cuba, Mexico and Uruguay. Partial rationale for inclusion of these particular nations is that four of them – Argentina, Barbados, Cuba and Uruguay – have experienced the most pronounced rate of population aging and are among the most advanced countries in the Latin American/Caribbean region. The three remaining countries – Brazil, Chile and Mexico – are, to varying degrees, behind the other four in terms of the rapidity of population aging (Wong et al. 2006).

Aging in developing nations of the Eastern hemisphere has also received demographic attention. From 1989 to 2001, researchers from the Population Studies Center, the University of Michigan and several Asian universities have worked together as part of the

“Rapid Demographic Change and the Welfare of the Elderly” study of the Philippines, Taiwan, Thailand and Singapore. This cross-national collaboration has culminated in a remarkable exploration of aging in developing Asian countries. Elements of the study are ongoing in the continuing Comparative Study of Aging and Health in Asia (AHA), which focuses on Indonesia, Philippines, Singapore and Taiwan. The inclusion of these four nations, with varying levels of socioeconomic development, is particularly useful for investigating the interaction between broad demographic changes and conditions in each nation as well as for making comparisons between nations. Though not represented as extensively as other continents, quality survey data are also available from Africa. This is demonstrated by recent work using the World Health Collaborative Study on Social and Health Aspects of Aging to investigate intergenerational coresidence in Egypt (Yount 2005), differences in older adults’ decision-making power in Egyptian and Tunisian families (Yount and Agree 2004) and gender differences in disability among older Egyptian and Tunisian adults (Yount and Agree 2005). At this point, however, surprisingly few researchers have published articles using this dataset.

Studies with a purposive multinational sample (e.g., SHARE or SABE) or pre-packaged cross-national data files (e.g., LIS or CNEF) are a tremendous benefit to scholars analyzing these archival data. Although convenient, such datasets may not be practical for all cross-national research aims. Merging studies from distinct countries can provide a superb means of conducting comparative research but comparative research has its own unique set of challenges.

Another study that has been used to better understand the demography of aging is the China Health and Nutrition Survey (CHNS), which is under the auspices of the University of North Carolina’s Population Center. The survey consists of data collected in 1989, 1991, 1993, 1997, 2000 and 2004, all of which are publicly available via the study’s website (Carolina Population Center 2006). As of 2006, these data have appeared in over 200 published works and have been used to study conditions and processes (1) within China itself and (2) between China and other countries. Demonstrating the former approach, Du et al. (2004) revealed that rapid economic expansion has contributed to a striking decline in dietary quality for the Chinese lower class. Illustrating the latter strategy

– comparative research – Kim et al. (2004) combined the CHNS with the U. S. Continuing Survey of Food Intakes by Individuals. The investigators reported a paradoxical relationship between socioeconomic status and four health behaviors between Chinese and American subjects: as socioeconomic status increased in China, lifestyles became less healthy, whereas the opposite pattern was found in the United States. As a second example of combining the CHNS with other data, Doak et al. (2000) linked the Chinese dataset with national surveys from both Brazil and Russia to investigate whether body weights within households varied across nations.

These and many other investigations are providing unique insights into how aging transpires in different contexts, particularly how issues like social class differentially shape the aging process across societies. The scientific benefit of comparative research is impressive but it also reveals the challenging decisions faced by researchers.

Design Decisions Regarding Comparative Research

Whether one is reviewing the extant research or attempting to contribute to the literature on the comparative demography of aging, several important research design issues must be considered. We articulate six such issues that are critical for comparative research: (1) nations considered, (2) measurement, (3) timing of data collection, (4) sampling and sample composition (5) age range and (6) unit of analysis.

Nations Considered. In the cross-national studies mentioned above, careful consideration was given to the choice of nations for comparison. For instance, Doak et al. (2000) exploited the availability of household level data in the Brazilian Ó Pesquisa Nacional sobre Saúde e Nutrição (PNSN) survey and the Russia Longitudinal Monitoring Survey (RLMS) to link with the CHNS study. This is a creative and compelling comparison but also one requiring investigators to incorporate findings from each nation and to interpret differences with cultural sensitivity. High caliber research within any single nation is challenging, but the demands intensify when undertaking research across nations. Any nations can be compared but the utility of some comparisons are more readily apparent.

Nations differ in size, development and culture. The research must consider these sources of variation to make meaningful comparisons.

Measurement. There are many decisions regarding measurement when conducting comparative research. Do the surveys measure the same concepts? If yes, does the concept have the same meaning in each nation? These and other questions merit careful consideration.

Researchers interested in merging multiple national datasets may face the situation where measures important to their research agenda may not be present in a national study that is otherwise well-suited for their purposes. That is, there may be excellent congruity between several characteristics of two datasets but incongruity on other concepts. For example, there is a burgeoning interest in incorporating biological specimens in survey data, a theme elaborated upon in section three of this chapter. Although the CHNS closely resembles the U.S. National Health and Nutrition Examination Survey (NHANES) in many respects, it has yet to introduce measurements for these increasingly popular “biomarkers,” which NHANES has included since 1994. According to its project directors, the CHNS has recognized the importance of including this information and plans to have biological variables collected in its 2009 wave. This goal, however, is contingent upon future funding. Clearly, a number of concurrent developments (beyond the analyst’s control) must unfold for many research projects to take flight. Still, the enterprising researcher can take advantage of international data that are available and tailor a combination of available measures in the datasets to one’s analytical goals, perhaps recasting the research question somewhat (Elder et al. 1993).

Measurement concerns may be modest when employing objective measures of concepts available in comparative data such as body height and weight. The issues are more complex, however, when studying concepts such as socioeconomic status and health behavior (Kim et al. 2004) or even more abstract constructs such as self-esteem or perceived control of health. Although a more detailed account of question comparability between languages and culture-sensitive context effects is beyond the scope of this chapter, Harkness et al. (2003) offer helpful perspectives on these and other cross-national research design issues.

Beyond content and construct validity, discrepancies in *measurement error* between national surveys present potential bias when drawing comparisons from

comparative data. Returning to the comparison between the CHNS and the NHANES, a researcher may be interested in utilizing mortality files, which are available in both studies and linked to official government records in both cases. Should the measurement error between the American and the Chinese record keeping differ in any systematic and appreciable way, efforts to analyse mortality between the nations would be compromised by different measurement protocols. McKee (2001) offers a pointed case study of how systematic measurement bias in Russia and former Soviet states has tainted mortality data. He cautions scholars about using similar data from many of the republics of Central Asia. We consider other issues regarding record linkages later in this chapter.

Timing of Data Collection. Analysts may also have to face situations where the timing of data collection was not identical across nations. It is uncommon to have complete chronological consistency when merging data from two or more national studies, so it is often necessary that what was measured at one point in time in nation p corresponds with its corollary measurement in nation q at a different point in time. In the Doak et al. (2000) study mentioned above, the Brazilian data were from 1989 and the Russian data from 1996, while the CHNS data came from its 1993 wave. Though not a criticism of the paper, these three points of measurement are situated in three different locations of historical time. Chronological discrepancy may not be consequential for all cross-national analyses but it is something to carefully consider when linking datasets.

Sampling and Sample Composition. Distinct sampling procedures may or may not yield similar estimates of population parameters. Thus, it is important to assess potential compromises to external validity that may result from different sampling procedures. For instance, although the study is called the Chinese Health and Nutrition Survey, the CHNS is in actuality a regional Chinese study; it includes only 9 out of China’s 32 provinces in its sampling frame. In essence, the CHNS’s sampling technique covers a little less than half of the country’s population. If an analyst was to compare the CHNS with studies such as the NHANES in the United States, which includes a nationally representative sample, one needs to be aware of the different sampling methods when drawing conclusions.

In keeping with Jackson’s (2002) appeal for more *comparative processes research*, several American

studies stand as excellent candidates for combination with studies from other countries. For instance, the recent National Survey of American Lives oversamples African- and Caribbean-Americans. The Midlife Development in the United States (MIDUS) survey includes minority-group subsamples from adults in New York City and Chicago, a twin component and an ongoing biological specimen collection. It is common in other national studies, such as NHANES, HRS and LSOA, to oversample racial minorities and ensure that racial differences can be assessed within the American population. The proliferation of available studies from other countries offers exciting potential for developing recombinant data files.

Age Range. Another issue of research design to consider is the age inclusion criteria, a characteristic that varies widely across datasets. Some studies, such as the Survey on Health, Well-Being and Aging in Latin America and the Caribbean (SABE) examine only persons 60 and over. Although some research questions are best addressed with a more limited age range, other research questions related to aging require a wider age range, or what might be considered more *cohort-inclusive data*. For other studies, such as the English Longitudinal Study on Ageing (ELSA), being at least 50 years of age is the inclusion criteria. One of the reasons that some aging studies have included broader chronological categories, including people in middle-age, is that data spanning greater periods of time and a greater number of cohorts (instead of just older persons) are useful for studying the process of aging. This trend also reflects gerontologists' growing interest in the life course (Longino 2003).

Unit of Analysis. An additional study design consideration is the unit of analysis. It is important to recognize that many studies have moved beyond only individual interview data and now include spouse or household data, referred to as Multiple Household Procedures (MHP) (Myers 2000). The MHP approach has been developed in the United States through the Health and Retirement Study (HRS) and the Asset and Health Dynamics of the Oldest Old (AHEAD). A number of studies from outside of the United States also include both units of analysis. For example, the Matlab Health and Socioeconomic Survey is a study from Bangladesh consisting in households as the primary unit of analysis but also gathering data from individuals.

In conclusion, the optimal dataset, or combination of several data sets, depends upon the research

design and the questions that the researcher wants to address. Different research questions can require quite different data files. As an example, the Matlab Health and Socioeconomic Survey was designed as a unique microlevel data set for research on aging, intended to facilitate indepth analyses on topics related to life-cycle investments in the physical, economic and social wellbeing of older adults. The survey effort involved collecting data from persons 50 and over in a rural area of Bangladesh. For some research goals, these data may be ideal. Investigators have used Matlab data to compare the reliability and validity of subjective health ratings in rural Bangladesh to those living in rural areas of the United States (Rahman and Barsky 2003) and to explore whether gender differences in functional abilities are due to differential reporting across cultural contexts (Rahman and Liu 2000). But if the researcher wants to make broader comparisons between different nations or invoke issues related to public policy or governance, multinational studies such as the LIS or SHARE will allow more compelling comparisons. Should these packaged data files fall short of the researcher's needs or expectations, merging comparable studies from multiple nations may be the best – though not always the easiest – solution.

Discoveries from Studies of Twins and Centenarians

An other approach to comparative research has been to use twin registries, thereby providing a unique perspective on genetic influences on aging. The International Society for Twin Studies has information posted on over 40 twin studies from various countries in Asia, Europe, North America and Oceania on its website (International Society for Twin Studies 2006). Some studies are primarily focused on the development of medical conditions such as type I diabetes, cardiovascular disease, or bipolar disorder, while others have broader demographic appeal. The foremost twin study in the world, the Swedish Twin Registry, began in 1961 and includes over 172,000 twins. The registry has data from three different time periods – over 10,000 pairs born between 1886 and 1925, about 50,000 pairs born from 1926 through 1967 and approximately 36,000 pairs born since 1967. The Swedish Twin Registry is an

ongoing project and a goldmine for studying genetic/environmental influences on aging, health, functional ability and an inexhaustible number of other topics. As of 2005, over 400 papers using the registry have been published. See Lichtenstein et al. (2002) for an excellent review of the Swedish Twin Registry and some of the findings through its 40 year history.

The Swedish Twin Registry also features several subsets, such as the Swedish Adoption/Twin Study on Aging (SATSA), comprising twins who were reared apart and a matched sample of twins reared together (1,922 pairs). Currently SATSA follow-ups are being used to investigate patterns of normal and successful aging. This endeavor includes a tri-yearly questionnaire component, in-person cognitive testing and health examinations.

Other studies, however, focus on the oldest of older people – centenarians – a sliver of the aging population but a group whose characteristics make them important subjects for certain research aims. As a prime example of this approach, the New England Centenarian Study has enrolled over 1,500 subjects, including people 100 years or older, their siblings and children and control participants. Other notable centenarian studies include the Okinawa Centenarian Study with over 600 subjects and the Georgia Centenarian Study, currently in its third phase with 244 centenarian participants.

In summary, the appropriateness of data for studying aging depends on the specific research inquiry. The merits of national surveys versus cross-national studies depend on whether one is interested in studying a phenomenon in a single region or in making comparisons across places. Longitudinal studies are generally preferred to cross-sectional investigations but the type of research being conducted ultimately determines the parameters of what are acceptable and profitable data.

Data Resources

When considering the breadth of data currently being used for studying aging, the question often arises: How does one gain access to these files? Countless hours have been spent interviewing subjects in the field and/or over the telephone, removing subject identifying information and converting records into usable files. Archival data are an invaluable resource to scientific

discovery, but locating and expeditiously accessing the data are important considerations when undertaking research on aging and population dynamics. Thus, we briefly explore alternative strategies to search for data. We then discuss how data sets are managed, including which groups organize their storage and make them readily accessible. Finally, we will address issues related to accessing these data.

Searching for Data

Published Studies. Perhaps, one of the best ways to become familiar with various types of data useful for demographic analyses of aging is to search for published articles. Again, the best journal to target depends mainly upon the substantive focus or question to be addressed. The *Journal of Gerontology: Social Sciences*, for instance, publishes work that is international in scope, with articles from studies in Europe (e.g., Avlund et al. 2004; Erlangsen et al. 2003; Meinow et al. 2004), Africa (Aboderin 2004), Japan (Raymo et al. 2004), Western Pacific nations (Su and Ferraro 1997) and elsewhere on the globe comparing American policies or aging phenomena (e.g., Davey et al. 2005). Although in the years 1990, 1995 and 2000, only 1 cross-national comparative study was published per year, four cross-national studies were published in 2005.

Demography journals such as *Demography*, *Population Studies* and *Population and Development Review* have a longstanding interest in population trends around the globe and they have also given considerable attention to issues of comparative population aging. A perusal of recent issues illustrates how a number of intriguing substantive inquiries can be matched to datasets, particularly with regard to the study of mortality. For instance, recent research highlights mortality inequalities across developed nations such as Britain, Canada and Denmark (Edwards and Tuljapurkar 2005). Other recent comparative research projects age- and AIDs-related mortality trends across 23 sub-Saharan African nations (e.g., Benin, Cameroon, Kenya) (Timaues and Jasseh 2004) or compares mortality trends between American, Dutch, French and Japanese women (Mesle and Vallin 2006). These recent papers are just a few noteworthy highlights from esteemed demography journals.

Other excellent publications to search for comparative research on aging include *Age and Ageing*, *Ageing and Society*, *Australasian Journal on Ageing*, *Canadian Journal on Ageing*, *The European Journal of Ageing: Social, Behavioral and Health Perspectives*, *Hallym International Journal of Aging*, *Indian Journal of Gerontology* and *Journal of Cross-Cultural Gerontology*. Articles typically describe how the data were made available to the authors; if this information is unclear in the description of their methodology, contacting the authors regarding where they obtained the data can be an effective strategy.

There are two main reasons to search published studies for comparative data: (a) knowledge that specific measures are available and (b) links to the extant literature on a subject of inquiry. The chief disadvantage is probably the time lag associated with the publication of scientific research.

Data archives and directories. Another helpful place to identify useful datasets is through data archives available online. As will be discussed below, the largest of these computerized archives in the United States is the *National Archive of Computerized Data on Aging* (NACDA) (Inter-University Consortium for Political and Social Research, n.d.). The biggest advantage of NACDA is its expedient design; researchers can directly download available studies from its website. Though few archives or directories can match NACDA's convenience, there are other online compendia which document the many studies available for research on aging.

The National Institute of Aging has formed one of the finest of such directories entitled "Publicly Available Databases for Aging-Related Secondary Analyses in the Behavioral and Social Sciences." (National Institute on Aging 2006). This 137 page document is well-organized for its size and clearly describes each of the 72 studies listed. It also provides information on how to obtain the various data. Other similar directories, though often somewhat less informative than the National Institute on Aging's index, can help researchers get a foothold for available data in specific areas of the world or specialized populations. Examples include compendia of Asian single- and multination studies (University of Michigan Population Studies Center 2006), African studies (World Health Organization 2003) and twin registries (International Society for Twin Studies 2006).

How the Data are Compiled

Although many entities have compiled international data on aging, the National Institute on Aging (NIA) has developed and is currently funding 13 Centers for the Demography of Aging to serve as infrastructure to develop, maintain and proliferate research on a variety of aging-related issues. Each of the 13 centers has a unique focus but international collaboration is a central concern for most of them. For example, USC-UCLA has partnered with Nihon University (Japan) for the Nihon University Longitudinal Study on Aging (NUJLSOA) and University of Pennsylvania and University of Wisconsin are collaborating with Mexican researchers to undertake the Mexican Health and Aging Study (MHAS). These centers have been instrumental in undertaking projects on global aging issues, maintaining data and making them user-friendly as well as helping to maintain and expand networks among scholars in aging. These centers are interdisciplinary and provide pilot programs on innovative research topics. They also often fund workshops, training programs and conferences.

Cross-national collaborative centers in Europe have also had much success in coordinating various research projects. One such center, the Ageing, Health and Retirement (AGIR) project is a branch of the larger European Network of Economic Policy Research Institutions (ENEPRI). AGIR has connected scholars from Belgium, England, Finland, France, Germany, Holland and Spain to focus on retirement and health care expenditures, offering projections to help guide public policy. Another exemplar of European collaboration in demographic studies related to aging is the Max Planck Institute for Demographic Research. Scholars of this institute have worked on statistical methods and organized and systematized various data sets to improve analyses, particularly related to aging and mortality. The institute has a strong focus on data management issues. For instance, one of the exciting projects undertaken by the Max Planck Institute is the Kannisto-Thatcher Database on Old-Age Mortality and Exceptional Longevity, which has enabled researchers to estimate death-rates among the oldest-old.

Other consortia or networks of investigators are helpful for comparative research on aging. For instance, a growing number of researchers are interested in the AIDS crisis and population aging. The University of Michigan's Demography of Aging Center has

developed a coalition called The Research Network on HIV/AIDS and the Elderly (University of Michigan Center on Demography of Aging 2006) to facilitate worldwide research efforts. Users can access data from Africa via the website, including the Kenya Diffusion and Ideational Change Project, the Malawi Diffusion and Ideational Change Project and the Malawi Family Transfers Project, all of which are freely available. In addition, there is a merged file that combines these various datasets and includes village-level information and data on interviewers' characteristics.

Availability of the Data

The emergence of rich cross-national data has great utility for those who have access to them but there are constraints on access to many data sources. Fortunately, there has been a proliferation of public-access datasets made freely available to interested researchers and students. Although not all data are freely accessible, various agencies and collaborative groups have been striving to enable all scholars to be able to retrieve and analyse myriad data.

As Maddox (1997) observed, science in general and gerontology in particular are necessarily public enterprises. Scientific advancement hinges on both the accountability and verification of findings of other scholars and on the financial investments that make research feasible. Large-scale research projects, especially multinational ones, are costly ventures, yet they often abound in potential for theory-testing. Public access to data is thus cost-effective and efficient for at least two reasons. First, to maximize the potential of these expensive datasets in order to further the field of inquiry, open access is empowering in an efficient manner. Second, scholars developing a research program or lab can devote time and other resources to utilizing and storing data, without having to face the financial difficulties of collecting large-scale studies themselves (Ferraro 2003). Both of these issues are particularly germane to the longitudinal data used by many gerontologists; Maddox (1997, p. 324) stated the situation aptly:

Large public use datasets also increasingly provide essential longitudinal evidence about ageing processes... that could never be produced by individual scholars working alone with one or two datasets. Moreover, the

increasingly free exchange of research data will surely enhance research training and facilitate exchange of ideas among investigators into ageing worldwide.

Probably the entity most instrumental in ensuring that the wealth of data related to aging becomes utilized has been the National Archive of Computerized Data on Aging (NACDA). Housed at the University of Michigan and under the auspices of the Inter-University Consortium for Political and Social Research (ICPSR), NACDA archives computerized data on their secure network, facilitates use by supplying interfaces to statistical packages (e.g., SAS, SPSS, Stata), collaborates with researchers and offers technical support and workshops for those using the data. At this point, NACDA holds over 1,300 different studies related to aging, which are categorized under the following headings: demographic characteristics of older adults; social characteristics of older adults; economic characteristics of older adults; psychological characteristics, mental health and well-being of older adults; physical health and functioning of older adults; and health care needs, utilization and financing for older adults.

One of the key strengths of NACDA is the continual expansion of the databank. NACDA actively seeks additions and works alongside researchers in converting data to computerized format. On its website, NACDA has identified its priorities for seeking certain types of data (ICPSR, n.d.):

- Longitudinal data that include middle age and older adults to study processes of aging
- Repeated cross-sectional data to study social change and cohort experience
- Enhancements to current holdings such as to provide longitudinal elements to cross-sectional research or to link medical records with longitudinal data
- Data on minority aging in the U.S. to make comparisons across ethnic groups
- Data from probability samples
- International and cross-cultural data, especially when they allow comparison with U.S. data
- Government or foundation funded data on aging identified as "high priority" that are not actively being distributed from another source
- "Window of opportunity" data, such as classic studies.

NACDA's commitment to international and cross-cultural data is reflected by the growing number of such studies available in the archive. NACDA's council

Table 2.1 Downloads of selected NACDA international datasets from July 1, 2002 to June 25, 2005^a

Dataset	Downloads
<i>All datasets</i>	127,650
Matlab health and socioeconomic survey	94,812
Malaysian family life survey	11,416
Guatemalan survey of family health	8,514
Bicol multipurpose study	5,401
Swedish adoption twin study on aging	3,843
Australian (Adelaide) longitudinal study of aging	1,190
Survey on health, well-being and aging in Latin America and the Caribbean	809

^a Other datasets were downloaded but these represent the seven most frequently accessed.

formally prioritized the expansion of international and cross-cultural studies at a 1996 Workshop on International Databases and it has continued to advance this area ever since. There are currently about 30 datasets drawn from nations outside of the United States; many of these data come from single nations and include smaller-scale studies (e.g., the Guatemalan Survey of Family Health) but larger-scale, single-nation studies are also available through NACDA, (e.g., the Australian Longitudinal Study of Aging). In addition, the database contains several research projects such as the World Health Organization Collaborative Studies and the Survey on Health, Well-Being and Aging in Latin America and the Caribbean, which are designed for cross-national analysis.

From NACDA's usage records, it is apparent that many scholars utilize its services. Between July 1, 2002 and June 25, 2006, there were 127,650 downloads of international datasets. It must be kept in mind that many of these downloads may reflect repeated accessing of the same data or casual, exploratory downloads given the files' ease of acquisition. Still, the numbers are telling. Of the downloaded files, over 80 per cent were the Matlab Health and Socioeconomic Survey (94,812). In addition, the Malaysian Family Life Survey was downloaded over 11,000 times and the Guatemalan Survey of Family Health was downloaded over 8,000 times.

The studies mentioned above are among the many that NACDA provides with complete access to any person. In addition to these datasets, there are other studies that have some stipulations for usage. Several studies are available on CD-ROM, as opposed to being downloadable through the website. One of these studies, the Dynamics of Population Aging in

Economic Commission for Europe (ECE), is ideal for cross-national research. These data are a compilation of 1990 census information from eight Eastern European countries (Bulgaria, Czech Republic, Estonia, Finland, Latvia, Lithuania, Romania and Turkey). The assemblage falls under requirements that each individual researcher must complete a Pledge of Confidentiality form before they are able to receive the CD-ROM and analysts are not permitted to disseminate the data to others who have not signed the proper documentation. Nonetheless, this protocol, which is also required for several other datasets (e.g., the Chinese Longitudinal Healthy Longevity Survey and Research Data on Minority Aging and Health) represents a modest requirement for obtaining these data.

NACDA's efforts to provide quality datasets at high levels of accessibility have enabled most data to be available for direct download or by CD. A small number of records kept at the archive, however, are deemed more sensitive and are considered *limited access* data. These datasets are obtainable only by persons affiliated with ICPSR institutions.

Besides NACDA, other organizations collect and store data related to aging. Also located at ICPSR, the Michigan Center on the Demography of Aging Data Enclave (MiCDA), is designed especially for limited-access data containing potentially sensitive information. One such study that illustrates these issues, albeit American, is the Health and Retirement Study, which has components linked to Social Security and wealth information. Access of these sensitive files from MiCDA is available only through on-site computing on a secure network and with close facility supervision. There are also stipulations on the types of analyses that can be completed.

Although there are disadvantages to this system, including financial and time expenses and the inability to transport data from the Michigan site to another location after performing analyses, there is also an advantage to the services that MiCDA affords to researchers. Some sensitive data, such as the HRS, are only otherwise available for researchers with a federal government research grant award, thus limiting many graduate students or persons in the business sector (Nolte and Keller 2001).

In addition to the two centers located at University of Michigan, NACDA and MiCDA, there are other means of accessing international data related to aging. The Council of European Social Science Data Archives,

for example, serves as a metasite that connects the electronic data archiving systems from across Europe as well as Australia, Canada, Israel, New Zealand, South Africa and Uruguay, essentially a launching pad to these various national archives (Council of European Social Science Data Archives, n.d.). Access privileges vary for many datasets stored and maintained by these national archives; most require some form of application or documentation and some require notification to principal investigators of the studies. Additionally, some of these national archives require institutional membership of the nation's research consortium for free data access. Without membership, there is sometimes a charge for the data.

The 13 population centers on demography of aging mentioned earlier also help make data available. Most of these centers maintain well-organized websites that link with a variety of data sources. On the other hand, some data are available through the websites that are not directly accessible through ICPSR or NACDA. For example, University of North Carolina holds several studies that are being undertaken by their researchers, such as the Russia Longitudinal Monitoring Survey and the China Health and Nutrition Survey. One can also easily download the Mexican Health and Aging Study from the University of Pennsylvania's Demography of Aging Center. These centers have been an enormous aid to the science of aging by ensuring that data under their auspices are organized and available for convenient access.

Enhancing Data with Record Linkages: Two Emerging Frontiers

The final section of this chapter addresses innovations in linking traditional survey or census data to additional information. As mentioned earlier, the Longitudinal Study of Aging (LSOA) was a pioneering study in that it began an extensive record linkage program in the 1980s, matching individual survey data with official records, such as Medicare and the National Death Index. Similarly, the groundbreaking Health and Retirement Study (HRS) has drawn on this strategy by linking respondents to a comprehensive array of wealth and financial records, including earnings and benefits information of respondents and deceased spouses, as well as data on pension plans and supplemental security income.

These means of enhancing traditional survey data have yielded tremendous gains in aging research, yet they raise a number of important considerations. First, as described in the discussion of measurement error discrepancies between studies in Section Two, the standards of quality for data kept by different government agencies is far from uniform. This introduces potential bias when making cross-national comparisons. Second, record linkages introduce a complicated tension: exhaustive data are optimal for scientific inquiry, yet ethics of privacy and confidentiality in human-subjects research impose limits on data linkages. Although cases of privacy invasion are extremely rare, concerns remain about potential breeches in information security after research subjects disclose sensitive information on their health or finances. Procedures for safeguarding sensitive data are clearly warranted and have become arguably more stringent in recent years.

Two more recent forms of record linkage – biomarkers and ecological data – have become innovative means of enhancing social science research, yet both remain somewhat controversial on the issues of privacy and confidentiality. We touch on each briefly, highlighting their utility for aging research.

The Promise of Biomarkers: Interdisciplinary Insights for Research on Aging

One important recent advance in survey research has been the incorporation of biological information with traditional social, economic and demographic data (Crimmins and Seeman 2001). A growing literature suggests that although the risks of morbidity and mortality increase as adults age past 65 years, chronological age is at best a proxy for other, more important processes that tend to coincide with advancing years alive (Spratt 1999). The logic of biomarker data is to identify the key biological corollaries of human maturation, stress, and functioning that can quantify the aging process in a more sophisticated way than relying on mere chronological age. Measurements of biological specimens, such as cortisol, high density lipid (HDL) cholesterol and glycosylated hemoglobin are some of the common biomarkers used to comprise indexes such as allostatic load, a “cumulative mea-

sure of physiologic dysregulation across multiple systems” (Karlman et al. 2002, p. 696). This field is advancing at a dizzying pace however, and new biomarkers are constantly being considered. For instance, the recently released National Social Life, Health and Aging Project (NSHAP) has incorporated an innovative battery of biological specimens, including vaginal swabs, which heretofore have not been collected in a population-based survey.

Research on population aging has been on the forefront of this exciting frontier. The University of Chicago’s Center on Demography and Economics of Aging, one of the NIA-funded centers for exploratory aging research, has carved out a niche for biomarker analyses (Chicago Core on Biomarkers in Population-Based Aging Research). The center has developed a yearly workshop on population-health and aging research and has addressed innovative topics such as the utility of new biomarkers for cognition in advancing ages and cultural and racial/ethnic considerations in using biomarkers (Lindau and Gavrilova 2006). The University of Southern California’s Population Center focuses on biodemography and has created a network of scholars interested in biological specimens. Both universities maintain informative websites that document current studies using biomarkers and provide perspective on the state of the science (National Organization for Research at the University of Chicago 2005; USC/UCLA Center on Biodemography and Population Health 2005).

A number of excellent international studies have incorporated biomarkers. The Multinational Monitoring of trends and determinants in Cardiovascular disease (MONICA) Project has been a mainstay in the study of how trends in heart disease have changed over time across different areas of the world. Other studies that have advanced the field by including biological specimen data include: Danish 1905-Cohort Study, Nihon University Longitudinal Study on Aging, English Longitudinal Study of Ageing and Social Environment and Biomarkers of Aging Study (SEBAS) in Taiwan. The SEBAS study, in particular, has been illuminating in that it has enabled researchers to test how cumulative physiological dysregulation affects mental and physical functioning in a non-Western population and raised the prospect of examining how cross-cultural social patterns influence its expression (Seeman et al. 2004; Seplaki et al. 2006).

Although biomarkers have captured the attention of many researchers and multiple population studies are

consequently including biological specimens, a key limitation of the present situation is that many surveys have included the measures in an *ad hoc* fashion. That is, research teams have recognized the importance and the utility of incorporating biological data and have added them as a component to ongoing panel studies. American studies such as the MIDUS and the HRS, for example, have followed this pattern, including only a subset of the original sample to obtain biomarkers in one of the follow-up waves. Other studies, such as the Long Term Care Survey (LTCS), have collected biological data from the entire sample, yet not with consistent measures across survey waves. Capturing biological specimens after baseline in a longitudinal study becomes especially problematic when there is a high level of non-response or lack of cooperation with laboratory protocol, as non-random selection bias complicates the use of the data. For instance, the Hispanic Established Populations for the Epidemiological Studies of the Elderly (EPESE), a noteworthy study of Hispanic adults in the Southwest, attempted to gain hemoglobin data through blood assays in order to study risk factors among diabetics but attained valid data from less than one third of the desired sample. Other studies that incorporate biological specimens after the survey baseline risk losing subjects at the highest risk of mortality at the outset of the study and these patterns of attrition introduce potential bias for hypothesis testing.

Notwithstanding, a number of exemplary longitudinal panel studies have included biomarkers from the outset of the investigation. The NSHAP, as discussed above, is a remarkable study with innovative biological information collected from the entire sample, in their homes, at survey baseline. Bringing the laboratory to the household is a strategy preferred to asking subjects to travel to a clinic or university; this method reduces underrepresentation of older and less mobile adults who might not otherwise be included in the study.

The English Longitudinal Study on Ageing, mentioned earlier in this chapter, has been an important harbinger of biomarkers in a population study. The ELSA began in 2002 and its investigative team had the foresight to incorporate a wide range of biological data at baseline and then obtain identical biological measures from the same subjects in 2004. As a final example, the Swedish Adoption/Twin Study on Aging, also discussed earlier in this chapter, is perhaps the archetypal longitudinal study containing biomarkers.

Not only does this ongoing research program allow extensive genetic/environmental investigation through its sample of twins reared apart and together but each wave of testing has included biological evaluations. These measurements began in 1986 and continue to the present day.

Multi-Level Approaches: Linking Individual and Ecological Data

Another promising line of inquiry is linking individual-level data with ecological data. Social scientists have long held that environmental context is important for shaping social interaction and development but sophisticated methods for undertaking such analyses are now more readily available. Interest in multi-level models has mushroomed in the past two decades as investigators have sought methods to analyse contextual data with individual records – what may be called clustered data. Software to analyse these data are readily available (e.g., HLM, Proc Mixed in SAS) and these methods could be a tremendous benefit to researchers investigating how ecological context influences outcomes measured at the individual level (e.g., wealth, health).

Coding data with ecological identifiers, sometimes called geocodes, has proliferated in recent years but so have privacy concerns. Indeed, U. S. officials have undertaken major steps to restrict access to geocoded data in order to protect the identity of survey respondents. For instance, the National Center for Health Statistics (NCHS) implemented a Research Data Center (RDC) to safeguard the identity of subjects. Thus, investigators seeking to use recently released NCHS data must do so through the RDC. This can be accomplished by electronic submission of software code to be evaluated by the RDC (principally through software designed to detect efforts at subject identification) or by using RDC computers in Hyattsville, MD in a secure computing environment (and agreeing to leave all materials in the RDC except those that have been approved by RDC staff).

It is too soon to tell precisely how the RDC procedures will influence the use of NCHS data but it clearly represents additional costs and another layer of data approval for which investigators must plan. The software for analyzing data linking ecological units to individu-

als is much more available now but we may anticipate that privacy concerns will remain a significant issue for researchers interested in comparing how ecological context influences individual-level outcomes.

Conclusion

This chapter developed three main themes related to data sources for the study of aging: the various forms of research design, the availability of data resources and two emerging issues that are shaping current data collection and analysis. Throughout each section, we have attempted to highlight some exemplary models of aging research in an international context, drawing attention to both noteworthy empirical reports and the datasets that make innovative inquiries possible. Hopefully, these examples will help stimulate ideas for research projects and expose scholars to the growing potential for international research. Our aim was not to be exhaustive but to illuminate this genre of research.

Recent developments in the technological capacity to store, share and analyse data have opened new avenues for research on population aging. For the first time in history, analysts have open access to data from all over the world – data that typically take years to collect, compile, clean and archive. Important primary steps for undertaking sophisticated analyses include knowledge of the breadth of available data, familiarity with the appropriate channels to gather them and an understanding of the comparative strengths, limitations and distinctiveness of particular datasets.

It is critical, however, that analysts bear in mind the principal elements of survey research and critically examine the utility of various research designs, such as the substantial differences between analytic approaches and the methodological limitations inherent in combining data across nations. With the privilege of having unprecedented accessibility to quality international data, analysts are held to a higher standard of proficient analysis and interpretation of the data. Yet these approaches are securing a prized position in the demography of aging and social gerontology. As illustrated in the prestigious journals of aging scholarship, the social processes, economic experiences and physiological risks linked to human aging are more thoroughly understood when explored in an international

context. It is our hope that this chapter offers insight for advancing this field of inquiry.

Acknowledgement We thank James McNally for information on the Inter-university Consortium for Political and Social Research and Ann Howell and Tetyana Pylypiv Shippee for helpful comments on earlier drafts of this manuscript.

References

- Aboderin I (2004) Decline in material family support for older people in urban Ghana, Africa: Understanding processes and causes of change. *J Gerontol Soc Sci* 59B:S128–S137
- Alwin DF, Campbell RT (2001) Quantitative approaches: Longitudinal methods in the study of human development and aging. In: Binstock RH, George LK (eds) *Handbook of aging and the social sciences* Academic Press, San Diego, pp 22–43
- Ajrouch KJ (2005) Arab American elders: Network structure, perceptions of relationship quality, and discrimination. *Res Hum Dev* 2(4):213–228
- Andrews GR (1993) World Health Organization Collaborative Study on Social and Health Aspects of Aging in Bahrain, Egypt, Jordan, and Tunisia, 1991 [Data file]. Available from Inter-University Consortium of Political and Social Research Web site, <http://www.icpsr.umich.edu/>
- Andrews G, Clark M, Luszcz M (2002) Successful aging in the Australian longitudinal study of aging: Applying the MacArthur model cross-nationally. *J Soc Issues* 58(4):749–765
- Andrews GR, Myers GC (1999) Australian [Adelaide] Longitudinal Study of Aging, Wave 6: [1999–2000] [Data file]. Available from Inter-University Consortium of Political and Social Research Web site, <http://www.icpsr.umich.edu/>
- Antonucci TC, Jackson JS (1990) The role of reciprocity in social support. In: Sarason IG, Sarason BR, Pierce GR (eds) *Social support: An international view*, Wiley, New York, pp 173–198
- Antonucci TC, Okorodudu C, Akiyama H (2002) Well-being among older adults on different continents. *J Soc Issues* 58(4):617–626
- Avlund K, Lund R, Holstein BE, Due P, Sakira-Rantala R, Heikinen R (2004) The impact of structural and functional characteristics of social relations as determinants of functional decline. *J Gerontol Soc Sci* 59B:S44–S51
- Borsch-Supan A, Hank K, Jürges H (2005) A new comprehensive and international view on ageing: Introducing the “Survey of Health, Ageing and Retirement in Europe.” *Eur J Ageing* 2:245–253
- Brady D (2004) Reconsidering the divergence between elderly, child, and overall poverty. *Res Aging* 26:487–510
- Burkhauser RV, Giles P, Lillard DR, Schwarze J (2005) Until death do us part: An analysis of the economic well-being of widows in four countries. *J Gerontol: Soc Sci* 60: S238–S246
- Carolina Population Center, Research Projects, Programs, and CPC-Sponsored Datasets (2006, August 28) China Health and Nutrition Survey. Retrieved November 27, 2006, from <http://www.cpc.unc.edu/projects/china>
- Council of European Social Science Data Archives. (n.d.) Retrieved November 27, 2006 from <http://www.nsd.uib.no/cessda/>
- Crimmins EM, Seeman T (2001) Integrating biology into demographic research on health and aging (with a focus on the MacArthur Study of Successful Aging). In: Finch CE, Vaupel JW (eds) *Cells and surveys: Should biological measures be included in social science research*. National Academy Press, Washington, DC, pp 9–41
- Davey A, Femia EF, Zarit SF, Shea DG, Sundström G, Berg S et al (2005) Life on the edge: Patterns of formal and informal help to older adults in the United States and Sweden. *J Gerontol Soc Sci* 58:S314–S322
- de Jong Gierveld J, Perlman D (2006) Long-standing nonkin relationships of older adults in the Netherlands and the United States. *Res Aging* 28(6):730–748
- Doak CM, Adair LS, Monteiro C, Popkin BM (2000) Overweight and underweight coexist within households in Brazil, China and Russia. *J Nutr* 130(12):2965–2971
- Du S, Mroz TA, Zhai F, Popkin BM (2004) Rapid income growth adversely affects diet quality in China – particularly for the poor! *Soc Sci Med* 59(7):1505–1515
- Edwards RD, Tuljapurkar S (2005) Inequality in life spans and a new perspective on mortality convergence across industrialized countries. *Popul Dev Rev* 31(4):645–674
- Elder GH, Jr, Pavalko EK, Clipp EC (1993) *Working with archival data: Studying lives*. Sage, Newbury Park, CA
- Erlangsen A, Bille-Brahe U, Jeune B (2003) Differences in suicide between the old and the oldest old. *J Gerontol Soc Sci* 60:S281–288
- Ferraro KF (2003) NACDA: Reflections from a resident scientist. *ICPSR Bull* 23:3–6
- Ferraro KF, Kelley-Moore JA (2003) A half century of longitudinal methods in social gerontology: Evidence of change in the Journal. *J Gerontol Soc Sci* 58B:S264–S270
- Harkness J, Van De Vijver FJR, Mohler PPH (eds) (2003) *Cross-cultural survey methods*. Wiley, Hoboken, NJ
- Hermans HJM, Kempen JG (1998) Moving cultures: The perilous problems of cultural dichotomies in a globalizing society. *Am Psychol* 53(10):1111–1120
- Hugo GM (2006) Immigration to global change in Asia: A review. *Geogr Res* 44(2):155–172
- International Society for Twin Studies (2006, March 27) Links to Related Topics. Retrieved November 27, 2006 from <http://www.ists.qimr.edu.au/links.html>
- Inter-University Consortium for Political and Social Research (ICPSR) (n.d.). National Archive of Computerized Data on Aging. Retrieved November 27, 2006 from <http://www.icpsr.umich.edu/NACDA/>
- Jackson JS (2002) Conceptual and methodological linkages in cross-cultural groups and cross-national aging research. *J Soc Issues* 58(4):825–835
- Jackson JS, Antonucci TC (1994) Survey methodology in lifespan human development research. In: Cohen SH, Reese HW (eds) *Life-span developmental psychology: Methodological interventions*, Erlbaum Associates, New York, pp 65–94
- Karlamangla AS, Singer BH, McEwan BS, Rowe JW, Seeman TE (2002) Allostatic load as a predictor of functional

- decline: MacArthur studies of successful aging. *J Clin Epidemiol* 55:696–710
- Kim S, Symons M, Popkin BM (2004) Contrasting socioeconomic profiles related to healthier lifestyles in China and the United States. *Am J Epidemiol* 159(2):184–191
- King R, Warnes AM, Williams AM (1998) International retirement migration in Europe. *Int J Popul Geogr* 4(2):91–111
- Lichtenstein P, DeFaire U, Floderus B, Svartengren M, Svedberg P, Pedersen NL (2002) The Swedish twin registry: A unique resource for clinical, epidemiological, and genetic studies. *J Intern Med* 252:184–205
- Lindau S, Gavrilova N (eds) (2006) Proceedings of the 2005 Chicago workshop on biomarkers in population-based aging research. NORC – University of Chicago Center on Demography and Economics of Aging. Chicago, IL
- Lobmayer P, Wilkinson R (2000) Income, inequality and mortality in 14 developed countries. *Sociol Health and Illn* 22:401–414
- Longino CF (2003) Why we are suddenly interested in the life course. *J Gerontol: Soc Sci* 58B:S326
- Maddox GL (1997) Research as a public enterprise: Social science data on ageing in the public domain. *Ageing Soc* 17:323–335
- Markides KS, Liang J, Jackson JS (1990) Race, ethnicity, and aging: Conceptual and methodological issues. In: Binstock RH, George LK (eds) *Handbook of aging and the social sciences*. Academic Press, New York, pp 112–129
- Markides KS, Rudkin L, Angel RJ, Espino DV (1997) Race, ethnicity, and aging: Conceptual and methodological issues. In: Martin LG, Soldo B (eds) *Racial and ethnic differences in the health of older Americans*. National Academy Press, Washington, DC, pp 285–300
- McGarry K, Schoeni RF (2000) Social security, economic growth and the rise in elderly widow's independence in the twentieth century. *Demography* 37:221–236
- McKee M (2001) The health consequences of the collapse of the Soviet Union. In: Leon D, Walt G (eds) *Poverty, inequality, and health: An international perspective*. Oxford, New York, pp 17–36
- Meinow B, Kareholt I, Parker MG, Thorslund M (2004) The effect of the duration of follow-up in mortality analysis: The temporal pattern of different predictors. *J Gerontol Soc Sci* 59B:S181–S189
- Mesle F, Vallin J (2006) Diverging trends in female old-age mortality: The United States and the Netherlands versus France and Japan. *Popul Dev Rev* 32(1):123–145
- Myers GC (2000) Comparative ageing research: Demographic and social survey strategies. In: Bengtson VL, Kim KD, Myers GC, Eun KS, (eds) *Aging in east and west families, states, and the elderly*. Springer, New York, pp 243–259
- National Institute on Aging, Behavioral and Social Research Program (2006, July) Publicly available databases for aging-related secondary analyses in the behavioral and social sciences. Retrieved November 27, 2006, from http://www.nia.nih.gov/NR/rdonlyres/7AE4D0D9-9DF7-4DF4-B8B9-468F19106E23/0/PubliclyAvailDatasetsJul_2006B.pdf
- National Organization for Research at the University of Chicago, Chicago Core on Biomarkers in Population-Based Aging Research (2005) Studies collecting biomarkers in population settings. Retrieved November 27, 2006 from <http://biomarkers.uchicago.edu/studiescollectingbiomarkers.htm>
- Nolte MA, Keller JJ (2001) Access to restricted data in a controlled environment: The Michigan Center on the Demography of Aging Data Enclave. Presented at “Enhancing Researcher Access to Confidential Data: Five Case Studies,” Joint Statistical Meetings, Atlanta, Georgia, 8 August
- Olshansky SJ, Grant M, Brody J, Carnes BA (2005) Biodemographic perspectives for epidemiologists. *Emerging themes in epidemiology*, 2, [<http://www.eteonline.com/contents/2/1/10>]
- Rahman MO, Barsky AJ (2003) Self-reported health among older Bangladeshis: How good a health indicator is it? *Gerontologist* 43:856–863
- Rahman MO, Liu J (2000) Gender differences in functioning for older adults in rural Bangladesh. The impact of differential reporting? *J Gerontol: Med Sci* 55M:M28–M33
- Raymo JM, Liang J, Sugisawa H, Kobayashi E, Sugihara Y (2004) Work at older ages in Japan: Variation by gender and employment status. *J Gerontol Soc Sci* 59B:S154–S163
- Rogers A, Raymer J (2001) Immigration and the regional demographics of the elderly population in the United States. *J Gerontol Soc Sci* 56B(1):S44–S55
- Seeman T, Gleib D, Goldman N, Weinstein M, Singer B, Lin Y (2004) Social relationships and allostatic load in Taiwanese elderly and near elderly. *Soc Sci Med* 59:2245–2247
- Seplaki CL, Goldman N, Weinstein M, Lin Y (2006) Measurement of cumulative physiological dysregulation in an older population. *Demography* 43:165–183
- Shaver S (1998) Universality or selectivity in income support to older people? A comparative assessment of the issues. *J Soc Policy* 27:231–254
- Sprott RL (1999) Biomarkers of aging. *J Gerontol Biol Sci* 54A:B464–B465
- Su Y, Ferraro KF (1997) Social relations and health assessments among older people: Do the effects of integration and social contributions vary cross-culturally? *J Gerontol Soc Sci* 52B: S27–S36
- Timmaeus IM, Jasseh M (2004) Adult mortality in sub-Saharan Africa: Evidence from demographic and health surveys. *Demography* 41(4):757–772
- University of Michigan Center on Demography of Aging, Aging AIDS Net (2006) Research network on HIV/AIDS and the elderly. Retrieved November 27, 2006 from <http://agingaidsnet.psc.isr.umich.edu/>
- University of Michigan Population Studies Center, Rapid Demographic Change and the Welfare of the Elderly (2006) Survey data. Retrieved November 27, 2006 from <http://aginginasia.psc.isr.umich.edu/data.html>
- U.S. Census Bureau (2006, November 22) International Data Base (IDB). Retrieved November 27, 2006, from <http://www.census.gov/ipc/www/idbnew.html>
- USC/UCLA Center on Biodemography and Population Health, Network on Measurement of Biological Risk (2005) Major studies using biomarkers. Retrieved November 27, 2006 from <http://www.usc.edu/dept/gero/CBPH/biomarker/studies.htm>
- Warnes AM (2001) The international dispersal of pensioners from affluent countries. *Int J Popul Geogr* 7(5):373–388
- Weinstein M, Goldman N (2000) Social Environment and Biomarkers of Aging Study (SEBAS) in Taiwan, 2000. [Data file]. Available from Inter-University Consortium of Political and Social Research Web site, <http://www.icpsr.umich.edu/>

- Wilson C (2001) On the scale of global demographic convergence 1950–2000. *Popul Dev Rev* 27:155–171
- Wong R, Pelaez M, Palloni A, Markides K (2006) Survey data for the study of aging in Latin America and the Caribbean. *J Aging Health* 18:157–179
- World Health Organization, Older Adult Health and Aging in Africa (2003, August 20) Directory on Research on Older Adult Health and Ageing in Africa: 1995–2003. Retrieved November 27, 2006, from http://www3.who.int/whosis/mds/mds_directory/mds_directory_english.doc
- Yount KM (2005) The patriarchal bargain and intergenerational coresidence in Egypt. *Sociol Q* 46:137–164
- Yount KM, Agree EM (2004) The power of older women and men in Egyptian and Tunisian families. *J Marriage Fam* 66:126–146
- Yount KM, Agree EM (2005) Differences in disability among older women and men in Egypt and Tunisia. *Demography* 42:169–187
- Zentralarchiv fuer Empirische Sozialforschung and Zentrum fuer Umfragen, Methoden und Analysen (ZUMA) (1998) German Social Survey (ALLBUS) Cumulative File, 1980–1996 [Data file]. Available from Inter-University Consortium of Political and Social Research Web site, <http://www.icpsr.umich.edu/>

Chapter 3

Global Population Aging: History and Prospects

Donald T. Rowland

Introduction

Population aging has a relatively brief history but one that clearly foreshadows a future in which aging will transform the social structure of many societies. In 1950, no country had more than 11 per cent of its population aged 65 and over; in 2000 the highest figure was 18 per cent but by 2050 it could reach 38 per cent. In most developed countries population aging began to cumulate slowly during the late nineteenth century as their fertility rates entered a phase of sustained decline. The aging of the world's population emerged much later and the proportion over age 65 passed 6 per cent only during the last quarter of the 20th century, by which time fertility decline was becoming a global phenomenon. In contrast, the history of old age – referring to the experiences of older individuals and groups – has been a subject of record since ancient times (see Achenbaum 2005). Cicero's (44 BC) essay *De Senectute* ("On Old Age"), for example, provides a window into past experiences, attitudes and beliefs about old age. His work foreshadows ideas about how individuals might preserve their health and vitality that became highly influential 2000 years later in research on "healthy aging" and "successful aging" (e.g., Rowe and Kahn 1998).

Besides its focus on the history of population aging, this chapter extends the account into the future, partly because the prospects for demographic aging have been more reliably ascertained than those for most other

phenomena in the social sciences and partly because it is clear that the first half of the twenty-first century will be the most consequential period in the whole course of population aging. The National Research Council (2001: 16) observed: "Today, population aging is poised to emerge as a pre-eminent worldwide demographic phenomenon." While there is no certainty about the details of future developments, broad directions and policy issues are clear. The prospects include adverse trends that are potentially modifiable through early interventions. In many countries the status quo, entailing a continuation of present demographic trends, is likely to prove unsustainable. Like the "inconvenient truth" of global warming, national and global population aging raise long-term issues for the twenty-first century, ones in which action or inaction in the early decades will be decisive in averting or compounding problems later.

Aging is already one of the mainsprings of social change and it is destined to gather further momentum as a force reshaping the nature of societies (Harper 2006; Kalache et al. 2005, Kinsella and Phillips 2005; National Research Council 2001; Uhlenberg 2005; United Nations 2002a). The fundamental shift is that aging is building a new and seemingly irreversible trend towards older people, aged 65 years and over, becoming more numerous than children and expanding their overall representation to between a quarter and a third of many national populations. From this will flow many changes in the structure and functioning of societies.

The demographic transition – "one of the best-documented generalizations in the social sciences" (Kirk 1996: 361) – provides the point of departure for this chapter, because it is the principal framework for considering temporal trends in aging and its main

D. T. Rowland
Adjunct Reader in Population Studies
School of Social Sciences
The Australian National University
Canberra, Australia
E-mail: donald.rowland@anu.edu.au

immediate causes, namely changes in fertility and mortality rates. Nevertheless, this chapter argues that the demographic transition, at least in its “classical” form, as envisaged by its founders, fails to reveal the diversity in the experience of national population aging and creates unrealistic expectations that aging evokes similar issues and responses in different societies. It is developments unimagined in classical demographic transition theory that will have greatest import for the future of aging societies.

Moreover, a special concern for the twenty-first century is the enormous prospective growth in the number of older people in developing countries. Although the hallmark of demographic aging is growth in the percentages, rather than the numbers, of older people, numerical increases evoke similar issues concerning the welfare of the aged. In the past, the living standards and welfare of populations, comprised predominantly of children and young adults, was an abiding preoccupation of third world development. In the twenty-first century, the legions of the elderly will become a major source of ongoing population growth in many developing countries. Their welfare needs call for particular recognition because they confront additional, age-related vulnerability.

In summary, this chapter examines the past and projected course of population aging with emphasis on the period 1950–2050. It focuses on major trends, issues and adaptations in developed and developing countries. The aim is to provide an overview and broad context for considering more detailed aspects of the demography of aging and its impact in particular societies. The chapter draws on the literature and new analyses of population data to present a mainly demographic perspective on global aging.

The Threshold of Later Life

Perceptions of the numbers and characteristics of the aged depend greatly on the threshold taken as the lower limit of old age. Since 1700, the perceived start of old age in Europe and North America has commonly fallen within a 30 year range centered on age 65 (Harris 1988, cited by Achenbaum 2005: 24). Despite this variability, demographic texts and studies have long employed age 65 as the start of later life, for instance in documenting demographic aging itself, defining dependency ratios

and comparing numbers in the commonly used summary age groups of children (under 15), working ages (15–64) and older ages (65 and over). The National Research Council (2001: 30) also defined “the elderly” as persons 65 and over. Nevertheless, age 60 has recently become the threshold of old age in United Nations publications, evidently in recognition of the growth in the numbers of older people in the shorter-lived populations of developing countries. Using 60 as the start of old age greatly augments the numbers in the older population. Globally, the population aged 60 and over in 2000 was 45 per cent higher than the population 65 and over. The figure for 2050 could still be 35 per cent higher, despite lengthening life expectancy and the aging of the aged population itself. Differences between the corresponding figures for Europe are 38 per cent (2000) and 25 per cent (2050). Although there are grounds for employing the younger boundary for less developed countries, where life expectancy is lower and ill health and lifetime poverty curtail economically active life, the opposite arguments support a higher threshold for more developed countries.

The absence of an agreed marker for the start of later life or old age results in different findings about the course of population aging, the lower the threshold the more pronounced the apparent changes and the greater the likelihood of overstatement, especially in relation to trends in developed countries. Yet a standard figure is always a compromise because aging has many dimensions among which chronological age is but one – although it is usually intended as an indicator of the others, including mental, physical, social and economic characteristics.

The main problem is that old age is a social construct, the meaning of which differs and changes through time and space. A recent example of an important change is apparent from Laslett’s (1989) reconceptualization of old age in contemporary developed countries as presented in his book *A Fresh Map of Life: The Emergence of the Third Age*. Instead of focusing on old age as such, Laslett identified four “ages” or stages of life, namely: (First Age) dependence, socialization, immaturity, education, (Second Age) independence, maturity, responsibility, earning, saving, (Third Age) personal fulfillment or achievement and (Fourth Age) dependence, decrepitude, death. Laslett adopted the concept of the Third Age as a basis for a more positive discussion of later life, in place of what he believed was an emphasis on decline and dependency. Laslett

saw this preoccupation as stifling human potential. While not designating any starting age, Laslett considered that for most people the Third Age becomes a possibility only at retirement. Not until the Fourth Age do population characteristics begin to align with stereotypes of physical and mental dysfunction.

The most controversial aspect of Laslett's proposal is whether "personal fulfillment" is a universal characteristic. Disbelievers redefine the Third Age simply as the stage between retirement and the Fourth Age (Siegel 1990). The disadvantage of such an alternative is that it neglects the positive view of the Third Age that Laslett was seeking, justifiably, to establish. Other possibilities are: the Third Age of "active leisure" (Blaikie 1999: 69) or "active retirement" (U3A Australia 2007). Another alternative envisages that "living independently" in later life (from age 65), apart from financial dependence on an age pension, is the main distinguishing characteristic of Third Age people in developed countries (Rowland 2003).

Nevertheless, as Laslett argued, the emergence of the Third Age is a significant force transforming the social structure of developed countries through the growth of a large group who are retired, healthy and reasonably free to pursue their own objectives. The challenge for society is to realize the potential of this large group and maximize the prevalence of other positive characteristics in the Third Age, such as socially and personally beneficial uses of time and abilities. While less attainable for socio-economically disadvantaged groups in developed countries, as well as the majority of people in developing countries, the Third Age is a preferable starting point for examining demographic trends and characteristics in older age groups in developed countries compared to regarding "the aged" as a single group.

A more utilitarian approach is the long-standing practice of distinguishing between the young-old (65–74 years), the old-old (75–84 years) and the oldest old (85 years and over). While providing a convenient means of summarizing information, such age ranges are unsatisfactory as a basis for distinguishing between the Third and Fourth Ages, because many people remain independent throughout long lives. Finally, although the Third Age has been emerging, two potential challenges to it are, firstly, the lengthening of working life as tax-based, pay as you go pension schemes become unaffordable and, secondly, a lack of opportunities for retired people to participate

fully in society. In this chapter, age 65 years is taken as the start of later life because it provides comparability with many national and international studies, as well as with the demographic literature generally. Also, distinguishing between people in the Third and Fourth Ages is a valuable first step in addressing diversity within older populations.

Aging and the Demographic Transition

The Classical Pattern

Statistical information on the history of population aging is incomplete but modeling of the course of the demographic transition provides an initial overview of trends because they depend mainly on better-known changes in birth and death rates. International migration is a lesser influence (Uhlenberg 2005: 146–147) but internal migration can have a great impact on the pace and extent of the aging of regional and local populations (Rowland et al. forthcoming). As a starting point, the course of population aging through time will be discussed with reference to the "classical" pattern of demographic transition, the historical average trend in vital rates in Western Europe since the eighteenth century (Table 3.1).

Population aging, which entails an increase in the percentage of the population aged 65 and over, began relatively late in the demographic transition, emerging in Europe only in the last quarter of the nineteenth century as fertility decline became prominent. Also, the numbers of the aged would not have begun to increase appreciably for sixty years or more after the start of mortality decline, when the cohorts with reduced childhood mortality began to reach later life. The representation of the aged was low in pre-transition populations because life expectancy was short and numbers dwindled rapidly from age to age. Only about 3 per cent of the population reached their 65th birthday in the pre-transition period (Table 3.1); harsh living conditions and infectious diseases meant that there was no Third Age for the masses and if individuals' had a Fourth Age at all it was likely to begin early and end relatively quickly.

Mortality decline in the first phase of the demographic transition tended to make populations younger, because

Table 3.1 Characteristics of populations during and after the demographic transition

	Pre-Transition	Mid-Transition	Post-Transition	Future declining ¹
Crude birth rate ²	50.0	45.7	12.9	9.8
Crude death rate ³	50.0	15.7	12.9	14.8
Annual growth rate per cent	0.0	3.0	0.0	-0.5
Age Structure per cent				
0-14	36.2	45.4	19.2	15.6
15-64	60.9	52.0	62.3	52.7
65+	2.9	2.6	18.5	31.7
Total	100.0	100.0	100.0	100.0
Dependency Ratios				
Child ⁴	59.0	87.0	31.0	29.6
Aged ⁵	5.0	5.0	30.0	60.0
Total	64.0	92.0	61.0	89.6
Percentage Surviving (females)				
To age 5	46.8	81.7	98.2	99.6
To age 65	7.8	43.3	83.1	94.2
Life Expectancy (females)				
At birth	20.0	50.0	75.0	85.0
At age 5	36.6	55.9	71.4	80.3
At age 65	7.5	11.9	15.7	22.2

Notes: ¹ Whereas the figures in the other columns derive from demographic models, those in the last column are based on data for Italy, for which the rates refer to 2025-2050, other data to 2050.

² Crude birth rate: births/population×1000.

³ Crude death rate: deaths/population×1000.

⁴ Child dependency ratio: 0-14/15-64×100.

⁵ Aged dependency ratio: 65+/15-64×100.

Sources: Hauser (1976: 66), World Bank (1994: 281), Coale and Demeny (1983) and Coale and Guo (1990: 33).

more children survived longer. As a result, the percentage of children rose from about 36 at pre-transition to a peak at mid-transition of about 45, while the percentage aged 15 to 64 fell correspondingly from 61 to 52 (Table 3.1). Only a slight increase would have occurred in the percentage in older age groups because the effects of mortality decline on cohort size were far greater at young ages, thereby rejuvenating age structures. Yet because mortality decline meant that larger cohorts were moving up the age pyramid, annual population growth rates rose from zero in the pre-transition period to a peak of 3 per cent at mid-transition. Expansion in the numbers of the aged ensued as a long-term effect of the flow of bigger cohorts through the age structure. This highlights the key point that substantial growth in the numbers of the aged can occur in the absence of population aging defined in percentage terms. In the 21st century, enormous increases in the numbers of the aged in developing countries will ensue from the flow of cohorts born during the 20th century "population explosion".

The timing of the start of population aging itself has varied between countries in Europe and elsewhere, depending when sustained fertility decline began. Fer-

tility decline causes aging by reducing the size of successive new cohorts and hence lowering the proportions in the youngest ages. In the demographic transition, numerical growth of the aged is maximized when there is a long delay between the start of mortality decline and the start of fertility decline, or when mortality decline is particularly rapid, as in developing countries in the second half of the twentieth century. These circumstances greatly increase the size of cohorts moving through the age structure. Similarly, growth in the percentages of the aged occurs most rapidly if fertility falls quickly. The classical model of the demographic transition envisaged a gradual decline in fertility and mortality, consistent with Western European experience and that by the post-transition stage the percentage in older ages would peak at less than 20 per cent (Table 3.1). In light of this limit and the associated slowing of population growth, demographic aging was generally considered a manageable trend and certainly no cause for apprehension (Notestein 1954; Cowgill 1970). Thus the rise in the percentage of the aged to 18 per cent in the second half of the transition period was recognized as a substantial change but one that was

gradual and able to be accommodated in prosperous economies. This assumed that birth rates would not fall below replacement and female life expectancy at birth would peak at little more than 75 years. These limits were misconceived.

Even post-transition populations, if they ever existed, would not have the static qualities implied in classical transition theory because of the continuing progression through the age structure of cohorts with differing characteristics. A common misconception is that, like the convergence of crude birth and death rates, the attainment of replacement level fertility, such as a total fertility rate (TFR) of 2.1 births per woman, signals the end of the demographic transition. However, the two types of measures are not the same because population growth and age structure change would continue for fifty years or more after the TFR stabilized at around 2 births per woman. In fact, the point at which replacement level fertility first occurs merely heralds the start of the time of greatest significance for population aging.

Critique

Expectations based on the demographic transition have now been overturned and the perceived 20 per cent limit to aging has proven false. Apart from an implicit belief that societies would maintain sufficient births to perpetuate themselves, there was never any justification for anticipating that the transition in births and deaths would end at a new equilibrium between them, or that demographic aging would cease at a similarly expedient level. This basic failure of demographic transition theory brings to the fore a range of other distinctive features of aging that emerged especially during the last quarter of the 20th century.

Divergence of trends and diversity of experience of population aging are characteristic, because national patterns of transition vary according to the timing and pace of changes in birth and death rates. Baby booms, political turmoil, economic adversity and social change have all been forces reshaping the outlook for aging. This does not mean that generalizations are impossible, only that there is no single representative model.

A more important point is that demographic change is ongoing and the post-transition stage is illusory. Neither replacement-level fertility nor equilibrium

between annual births and deaths are realistic end points. Indeed the current experience of below replacement fertility in Europe, East Asia and elsewhere foreshadows levels of aging and upheaval in society unforeseeable in the heyday of the demographic transition's influence on population thought. Some describe the phase of below-replacement fertility as a "second demographic transition" (van de Kaa 1987; Lesthaeghe and Surkyn 2004), because of its distinctive features, whereas others consider that the present fertility trend is a continuation of the original demographic transition or revolution (Coleman 2004). Yet the main implication for population aging is that in many countries current demographic trends are bringing new, far reaching consequences.

Not only has very low fertility changed the outlook but so too has very low mortality. The "classical" transition did not envisage the ongoing decline of death rates and the lengthening of life experienced in developed countries since the 1970s and projected to continue for decades hence (Oeppen and Vaupel 2002). Moreover, the explanation of demographic aging based on the demographic transition emphasizes the predominant role of fertility change, whereas lengthening life emerges as a major force in population aging when fertility is low (National Research Council 2001: 47). For example, even with replacement-level fertility, the percentage 65 and over would ultimately reach 19 per cent when female life expectancy is 80 and 26 per cent when it is 90. The difference, due solely to lower mortality, is equivalent to the effect of a substantial fall in fertility. When high life expectancy is combined with below replacement fertility, the outcome is very high levels of aging. Thus, with one child per woman, the representation of persons 65 years and older rises ultimately to 37 per cent when female life expectancy is 80 and 49 per cent when it is 90.

The new regime of birth and death rates is also creating a revolution in national and regional age structures. The demographic transition envisaged a single trend in age structure change, culminating in "rectangular" age profiles, with an even representation of age groups below the point where mortality begins to take a high toll. Now, however, very low birth and death rates are generating "v-shaped" age profiles that taper downwards so that the highest numbers are in the oldest ages.

Finally, preoccupation with the concept of "demographic aging" itself has diverted attention from

numerical changes in older populations. Absolute growth in the numbers of the aged, which can occur without corresponding increases in their proportion of the total population, is a key aspect of the processes of change in contemporary populations. All of the above problems point to the need to incorporate the continuing demographic revolution into accounts of the past, present and future of population aging.

Growing Percentages

Global and Regional Trends

For most of human history, the world's population would have had a young, triangular age structure, because this is the type of age structure consistent with the pre-transition regime of high and constant rates of fertility and mortality. At a smaller scale, epidemics, famines, wars, natural disasters and migrations would have often resulted in irregular age profiles. Despite these reversals, populations with high and constant birth and death rates have an inherent tendency to “forget” their past and return to a young age structure. This would occur in about two generations of unhindered natural increase because, in the absence of external influences, birth and death rates determine the shape of the age profile.

Early recognition of population aging occurred in France and Sweden in the late nineteenth century as their percentages aged 65 and over approached 8 per cent (Myers and Eggers 1996). In 1900 a Swedish researcher, Gustav Sundbärg, became the first to recognize the process of national population aging from “progressive” (younger) to “regressive” (older) age structures. Myers and Eggers also noted that while there was some heightened interest in population aging and depopulation during the 1930s recession, when below-replacement fertility first appeared, it was not until after World War II that concerted research on the issue began.

Historical statistics for Sweden indicate that the proportion aged 65 and over was about 5.5 per cent in the second half of the 18th century, falling slightly to 5.2 per cent in the first half of the nineteenth century as mortality declined and the representation of children increased. The figure of 5 per cent is also thought to have been typical for Western Europe around 1850. By 1900 the Swedish figure was 8.4 per cent, rising

slowly to 10.2 per cent in 1950. Population aging began earlier in France than in Sweden, during the early nineteenth or late eighteenth century, but it progressed more slowly (United Nations 1973: 266–268). Although the early figures will never be known with certainty, Sweden illustrates the protracted nature of national population aging that was characteristic before the last quarter of the twentieth century.

Subsequently many countries experienced accelerated aging as below replacement fertility became widespread among developed countries and rapid fertility decline affected growing numbers of developing countries. One indicator of the speed of aging is the interval in which the percentage aged 65 and over doubles from 7 to 14. The interval for France is 115 years (1865–1980), for Sweden 85 years (1890–1975), the United States 69 years (1944–2013) and the United Kingdom 45 years (1930–1975). In comparison, the corresponding estimates of the doubling time are only 26 years for Japan (1970–1996) and China (2000–2026) and even less for developing countries such as Thailand and Brazil (Kinsella and Phillips 2005: 13).

Statistics for the global population have never been known accurately because they rely on population estimates for many countries with deficient population data. United Nations estimates show the world's population with around 5 per cent in the older ages in 1950, rising to 7 per cent in 2000 and 10 per cent in 2025 (Table 3.2). In a growing population numbering 6.5 billion in 2005 this is a momentous change – one expected to continue, possibly bringing the world's percentage 65 and over to 16 in 2050.

The global figures are the net outcome of varied degrees of population aging in different regions and, although aging is expected to be almost universal, present contrasts seem destined to persist. Thus in 2050, the more developed regions may have 27 per cent aged 65 and over, compared with 14 per cent in less developed regions and 6 per cent in the least developed regions. The lowest percentages reflect assumptions about sustained high birth rates. The highest projected figure for all regions in 2050 is 34 per cent aged 65 and over in Southern Europe, compared with 29 per cent in Europe as a whole and 24 per cent in Eastern Asia – the oldest region apart from Europe. The projection for Southern Europe is potentially calamitous for the national economies of Italy, Greece and Spain and is undoubtedly a warning to be heeded.

Table 3.2 Global summary: percentages and numbers aged 65 and over, 1950–2050

	1950	1975	2000	2025	2050
<i>Percentages</i>					
World	5.2	5.7	6.9	10.4	15.6
More developed regions	7.9	10.7	14.3	21.3	26.8
Less developed regions	3.9	3.9	5.1	8.4	14.0
Africa	3.2	3.1	3.3	4.1	6.9
Asia	4.1	4.2	5.9	10.0	16.7
Europe	8.2	11.4	14.7	21.5	29.2
Latin America and the Caribbean	3.7	4.3	5.4	9.6	16.9
Northern America	8.2	10.3	12.3	18.7	21.4
Oceania	7.4	7.4	9.9	14.4	18.0
<i>Numbers (millions)</i>					
World	131	231	418	825	1,457
More developed regions	64	119	170	260	316
Less developed regions	67	113	248	565	1,140
Africa	7	13	26	56	138
Asia	57	101	216	477	905
Europe	45	77	107	147	176
Latin America and the Caribbean	6	14	28	67	136
Northern America	14	25	39	72	94
Oceania	1	2	3	6	9

Source: Calculated from United Nations (2001b).

National Trends

Because there is no uniform advance of countries from demographic youth to old age, the ranking of countries from oldest to youngest changes through time, as does the number of countries deemed to have an aging population. This particularly reflects variations in fertility trends and the size of cohorts reaching later life. Variations in rankings can also arise from the nature of the population data, due to inherent differences between sets of population estimates and projections. The discussion of national trends here seeks to take account of changes in the number and ranking of aging populations by including all countries, with a total population of a million or more, which had at least 10 per cent aged 65 and over at any of the five reference dates chosen to summarize trends, namely 1950, 1975, 2000, 2025 and 2050.

In this section, 20 per cent aged 65 and over is taken as the point of entry into the group of countries with the oldest populations, because 20 per cent is close to the former perceived upper limit of population aging. Beyond this, 30 per cent age 65 and over is taken as the threshold of “hyper-aging”: it seems inevitable that figures of this order will be associated with marked population decline, negative population momentum,

more older people than children, labor force decline and adverse consequences for economies and societies. The slow unfolding of the hyper-aging scenario, however, dampens the sense of urgency and impedes timely, proactive interventions. At the other extreme, 10 per cent is a convenient lower limit to denote the group of countries experiencing appreciable population aging; it is a figure associated only with fairly low fertility by historical standards, that is, long-term total fertility rates of less than 3 children per woman.

In 1950, only 9 countries (with total populations of 1 million or more) equaled or surpassed the 10 per cent figure and the highest figure was only 11 per cent aged 65 and over (France). The trend towards population aging is well illustrated, however, through the rapid changes in the number of aging populations and the peak percentage (Table 3.3). By the year 2000, there were 41 such countries and the peak figure was 18 per cent (Italy). By 2050, the aging populations could number 105, with a peak percentage of 38 (Spain). This century, many smaller countries, with total populations of less than a million, will also experience substantial aging, especially in Europe (e.g., Malta and Luxembourg).

In 1950 and 1975, all of the world’s aging populations (those with 10 per cent or more aged 65 and over) were in Europe, with the exception of the United

Table 3.3 Countries with the world's oldest populations 1950–2050 (percentages aged 65 years and over)

1950				2050		
	11 United Kingdom	15.8	17 Norway	21.8	1 Spain	37.6
1 France	11.4 12 Portugal	15.6	18 Singapore	21.5	2 Japan	36.4
2 Latvia	11.2 13 Austria	15.6	19 Hungary	20.7	3 Italy	35.9
3 Belgium	11.1 14 Norway	15.4	20 Portugal	20.7	4 Slovenia	34.8
4 United Kingdom	10.7 15 Denmark	15.0	21 Bulgaria	20.7	5 Greece	34.1
5 Ireland	10.7 16 Finland	14.9	22 Canada	20.6	6 Austria	34.0
6 Estonia	10.6 17 Latvia	14.8	23 Latvia	20.2	7 Czech Republic	32.7
7 Austria	10.4 18 Hungary	14.6	24 Poland	20.0	8 Switzerland	31.9
8 Sweden	10.3 19 Estonia	14.4	25 Hong Kong	20.0	9 Germany	31.0
9 Georgia	10.1 20 Croatia	14.1	26 Croatia	19.8	10 Sweden	30.4
1975	21 Slovenia	13.9	27 Estonia	19.7	11 Bulgaria	30.1
1 Sweden	15.1 22 Czech Republic	13.8	28 Lithuania	19.6	12 Portugal	29.8
2 Austria	14.9 23 Ukraine	13.8	29 Bosnia and Herzegovnia	19.0	13 Armenia	29.3
3 Germany	14.8 24 Netherlands	13.6	30 Ukraine	18.8	14 Hong Kong	29.2
4 United Kingdom	14.0 25 Lithuania	13.4	31 Russia	18.6	15 Bosnia & Herzegovina	29.2
5 Belgium	13.9 26 Belarus	13.3	32 Australia	18.5	16 Belgium	29.0
6 Norway	13.7 27 Romania	13.3	33 New Zealand	18.5	17 Hungary	29.0
7 France	13.5 28 Yugoslavia	13.1	34 Slovakia	18.4	18 Slovakia	28.9
8 Denmark	13.4 29 Georgia	12.9	35 United States	18.3	19 Lithuania	28.8
9 Czech Republic	12.9 30 Uruguay	12.9	36 Georgia	18.1	20 Ukraine	28.7
10 Latvia	12.7 31 Canada	12.6	37 Yugoslavia	17.6	21 Singapore	28.6
11 Hungary	12.6 32 Russia	12.5	38 Belarus	17.5	22 Latvia	28.2
12 Switzerland	12.6 33 United States	12.3	39 United Arab Emirates	17.1	23 Poland	27.9
13 Greece	12.2 34 Australia	12.3	40 Romania	16.9	24 Finland	27.9
14 Estonia	12.2 35 Poland	12.1	41 Cuba	16.7	25 Russia	27.7
15 Italy	12.0 36 New Zealand	11.7	42 South Korea	15.9	26 Georgia	27.5
16 Lithuania	11.1 37 Slovakia	11.4	43 Macedonia	15.7	27 Republic of Korea	27.4
17 Croatia	11.0 38 Ireland	11.3	44 Armenia	15.5	28 United Kingdom	27.3
18 Ireland	11.0 39 Hong Kong	10.6	45 Ireland	14.8	29 Cuba	27.1
19 Slovenia	11.0 40 Puerto Rico	10.5	46 Puerto Rico	14.7	30 Belarus	26.9
20 Bulgaria	10.9 41 Macedonia	10.0	47 Uruguay	14.0	31 France	26.7
21 Netherlands	10.8 2025		48 Republic of Moldova	13.8	32 Netherlands	26.5
22 Finland	10.6 1 Japan	28.9	49 Israel	13.2	33 Norway	26.2
23 United States	10.5 2 Switzerland	27.1	50 Trinidad and Tobago	12.7	34 Macedonia	26.1
24 Ukraine	10.5 3 Italy	25.7	51 China	12.6	35 Romania	26.0
25 Spain	10.0 4 Sweden	25.4	52 Chile	12.3	36 Denmark	25.9
26 Belarus	10.0 5 Finland	25.2	53 Mauritius	12.3	37 Trinidad and Tobago	25.7
2000	6 Germany	24.6	54 Sri Lanka	12.0	38 Yugoslavia	25.0
1 Italy	18.1 7 Slovenia	24.3	55 Argentina	11.4	39 Croatia	24.3
2 Greece	17.6 8 Greece	24.3	56 Azerbaijan	11.3	40 Canada	24.3
3 Sweden	17.4 9 Austria	24.3	57 Thailand	11.0	41 Azerbaijan	23.7
4 Japan	17.2 10 Belgium	23.7	58 Kazakhstan	10.9	42 Republic of Moldova	23.5
5 Belgium	17.0 11 Spain	23.6	59 Kuwait	10.5	43 New Zealand	23.0
6 Spain	17.0 12 Czech Republic	23.1	60 Albania	10.3	44 China	22.7
7 Germany	16.4 13 Denmark	22.5	61 Panama	10.2	45 Australia	22.4
8 Bulgaria	16.1 14 France	22.2	62 Brazil	10.0	46 Puerto Rico	22.1
9 Switzerland	16.0 15 United Kingdom	21.9	63 North Korea			
10 France	16.0 16 Netherlands	21.9	64 Costa Rica			

Table 3.3 (2050 continued)

47 Ireland	22.0	77 Algeria	16.2
48 Sri Lanka	21.3	78 Kyrgyzstan	15.8
49 Thailand	21.1	79 Myanmar	15.8
50 United States	21.1	80 Venezuela	15.7
51 Réunion	20.5	81 Uzbekistan	15.7
52 Mauritius	20.3	82 Libya	15.6
53 United Arab Emirates	19.8	83 El Salvador	15.5
54 Uruguay	19.5	84 Malaysia	15.4
55 Israel	19.4	85 Dominican Republic	15.3
56 Lebanon	18.9	86 Morocco	14.9
57 Bahrain	18.8	87 India	14.8
58 Mexico	18.6	88 Iran	14.7
59 Panama	18.4	89 Egypt	14.5
60 Albania	18.4	90 Tajikistan	14.3
61 Tunisia	18.2	91 Turkmenistan	13.9
62 Kazakhstan	18.2	92 Philippines	13.9
63 Jamaica	18.1	93 Syrian Arab Republic	12.4
64 Turkey	17.9	94 Bolivia	11.6
65 Brazil	17.9	95 Nicaragua	11.5
66 Chile	17.9	96 Honduras	11.4
67 Kuwait	17.8	97 Paraguay	11.3
68 Argentina	17.8	98 Jordan	11.2
69 Viet Nam	17.1	99 East Timor	11.1
70 Costa Rica	16.7	100 Bangladesh	10.9
71 Peru	16.7	101 Haiti	10.5
72 North Korea	16.6	102 Iraq	10.3
73 Indonesia	16.4	103 Ghana	10.1
74 Ecuador	16.3	104 Guatemala	10.0
75 Mongolia	16.3	105 Sudan	10.0
76 Colombia	16.2		

Note: The Table includes countries with 10 per cent or more aged 65 and over and a total population of 1 million or more. Source: United Nations (2001b).

States. By the end of the 20th century, this was still largely true despite the many additions to the numbers of aging countries, although the new entries did include Japan, which had emerged as one of the world's most rapidly aging populations. Australia, New Zealand, Canada and Hong Kong were among the other new additions to the list.

By 2025, many countries will have passed the former "20 per cent limit" and population aging will be spreading further to include growing numbers of countries in Asia and Latin America (Table 3.3). Eastern Asia, because of developments in Japan, Hong Kong, South Korea and China, will have become, like Europe, a major region of rapid aging. The transfor-

mation of China, the world's most populous nation, into an aging population will also have considerable ongoing implications for the extent of global aging. Furthermore, the 2020s seem likely to witness the emergence, for the first time, of levels of aging above the 20 per cent mark and even above 25 per cent in several countries, including Japan and Italy.

Beyond 2025 lie the most dramatic developments. By 2050 virtually all of the countries with the oldest populations at the start of the century will have more than a quarter aged 65 and over. Eleven of these, mainly in Europe and Eastern Asia, could then be in the throes of hyper-aging – the situation in which population aging becomes increasingly difficult to halt or reverse. It develops a negative momentum of its own, generating a "population implosion" potentially as consequential for the societies concerned as the population explosion. Countries projected to have more than 30 per cent of their populations in the older ages at mid-century are Italy, Greece and Spain, in Southern Europe, together with Japan, Germany, Austria and Switzerland. Another 27 countries, including Russia, the United Kingdom, France and the Netherlands could have 25–29.9 per cent of their populations in the older ages, placing them also on the approach to very high levels of aging.

By 2050, population aging is likely to be truly a world-wide phenomenon, except in most of sub-Saharan Africa. Meanwhile, the United States, Canada, Australia and New Zealand could remain among the youngest of the more developed countries if, as projected, there is a continuation of their above average fertility rates. China too, with 23 per cent 65 and over, would have a similar level of aging although differences in birth rates, associated with variations between urban and rural areas in the application of antinatalist policies, will generate much regional diversity.

Associated with the overall trend towards global aging are two other important demographic phenomena, namely the aging of the aged and unbalanced sex ratios among those 65 and over. The former can result from the progress of large cohorts through the age structure but more generally it is due to rising life expectancies and higher proportions living to 80 and beyond. The main concern is that the aging of the aged results in an expansion in the representation of people in the "Fourth Age" (dependency), particularly because the age category 80 plus has become the fastest growing segment of the aged population in many countries.

For example, in industrialized countries their representation increased from 13 to 20 per cent during the second half of the 20th century (National Research Council 2001: 35). However, differences in the size of cohorts reaching later life imply that some countries will not experience a continuation of this trend in the immediate future, for instance because the aging of the baby boomers will initially boost the representation of the young old.

An important factor in the aging of the aged has been the greater expansion in the numbers of elderly women, owing to the female advantage in life expectancy. Women comprise the majority of the elderly in most countries and their majority increases with age (Kinsella and Phillips 2005: 21). For example, at 65 and over the ratio of men to women in 2004 was 46:100 in Russia and between 68 and 74:100 in Germany, France, the United States and the United Kingdom (Kinsella and Phillips 2005: 22). In the future, longer survival of both men and women may be expected to reduce the sex ratio imbalance, with the highest gains among the young old. Although women have greater longevity, men have benefited socially as much if not more from the effect of improvements in the joint survival of married couples because the spouse is often the prime source of support in later life, especially in Western countries. Husbands with wives younger than themselves have a stronger likelihood of living out their days with the advantage of a spouse to care for them. Secular variations in the proportions marrying and divorcing, however, mean that longer life expectancy need not imply a greater prevalence or duration of spousal support in later life. Older women generally are more likely to face the prospect of living alone and reaching ages where infirmities are prevalent; hence they are more likely to need support from beyond the home or beyond the family.

Growing Numbers

As mentioned earlier, a disadvantage of the concept of demographic aging is that it refers solely to a rise in the percentage in older age groups; unless the percentage is rising, aging is not occurring. For decades the relatively low percentages of older people in developing countries was seen as indicating that population aging, and with it heightened concern about the welfare of the

elderly, was not of particular significance in much of Asia, Africa and Latin America. Thus the preoccupation with demographic aging itself long diverted attention from the equally significant phenomenon of the numerical growth of the aged, which has been occurring for centuries in conjunction with overall population growth (National Research Council 2001: 31). Only relatively recently has the growth in the numbers of the aged in developing countries become recognized as a global issue:

... the increase in the number of older persons will be greatest in developing countries. This is the most important observation. Over the next 50 years, the older population of the developing world is expected to multiply by four. This is an extraordinary development that bears implications for every community, institution and individual – young and old. Aging is definitely no longer just a “first world issue”. What was a footnote in the twentieth century is on its way to becoming a dominant theme in the twenty-first century. (Kofi Annan, Secretary-General of the United Nations, in United Nations 2002b: 66.)

Whereas increases in the percentages of older people are most marked in developed countries, issues arising from growth in the numbers of older people are present in all countries. Often, the aged are the most rapidly increasing group and rapid growth can be even more pronounced in the oldest ages, where health problems and aged care needs are most prevalent.

Future numbers of the aged are better known than future percentages, since the world's aged at mid-century are already born, whereas percentages depend to a considerable extent on the future numbers of children yet to be born. In the twenty-first century, the children of the twentieth century's population explosion will all enter the older ages, as will the developed countries' generation of “baby boomers”. Between 2000 and 2050, the numbers aged 65 and over in more developed regions is projected to rise from 170 million to 316 million (Table 3.2). Dwarfing even this huge increase are the corresponding figures for less developed regions of 248 million in 2000 and 1.14 billion in 2050. By 2050 the aged in less developed regions could outnumber the aged in more developed regions by nearly 4 to 1.

Until the twenty-first century relatively few countries had large populations of older people (Table 3.4). China with an estimated 41 million in 1975 stood out as the country with by far the largest numbers, a lead it is destined to maintain. India and the United States, each with more than 23 million in 1975 similarly had numbers of older people exceeding the total populations of many countries. By the year 2000, 14 countries had

Table 3.4 Countries with the world's largest populations aged 65 years and over, 1950–2050 (millions)
(Only includes countries with 5 million or more aged 65 years and over)

1950	1975	2000	2025	2050	Row					
China	25	China	41	China	87	China	195	China	332	1
United States	13	India	24	India	50	India	112	India	233	2
India	12	United States	23	United States	35	United States	64	United States	84	3
Germany	7	Russia	12	Japan	22	Japan	36	Indonesia	51	4
Russia	6	Germany	12	Russia	18	Russia	24	Brazil	44	5
United Kingdom	5	Japan	9	Germany	13	Indonesia	23	Japan	40	6
		United Kingdom	8	Italy	10	Brazil	22	Bangladesh	29	7
		France	7	Indonesia	10	Germany	19	Russia	29	8
		Italy	7	France	9	France	14	Pakistan	29	9
		Ukraine	5	United Kingdom	9	Italy	13	Mexico	27	10
				Brazil	9	United Kingdom	13	Germany	22	11
				Ukraine	7	Mexico	12	Viet Nam	21	12
				Spain	7	Pakistan	12	Nigeria	19	13
				Pakistan	5	Bangladesh	11	Iran	18	14
						Spain	9	Philippines	18	15
						Thailand	9	Turkey	18	16
						Korea	9	Thailand	17	17
						Viet Nam	9	France	17	18
						Turkey	8	Egypt	16	19
						Nigeria	8	United Kingdom	16	20
						Canada	8	Italy	15	21
						Poland	8	Korea	14	22
						Ukraine	8	Spain	12	23
						Philippines	7	Colombia	11	24
						Egypt	7	Myanmar	11	25
						Iran	7	Canada	10	26
						Argentina	6	Argentina	10	27
						Colombia	5	Poland	9	28
								Ukraine	9	29
								Algeria	8	30
								Congo	8	31
								Ethiopia	8	32
								Morocco	8	33
								Peru	7	34
								Venezuela	7	35
								Uzbekistan	6	36
								Sudan	6	37
								Tanzania	6	38
								Australia	6	39
								Malaysia	6	40
								Iraq	6	41
								Saudi Arabia	5	42

Source: United Nations (2001b).

aged populations numbering 5 million or more, compared with a prospective 28 countries in 2025 and 42 in 2050. By 2050, there will be two “super giant” aged populations: China, with 332 million and India, with 233 million. At mid-century, India and China together could have 39 per cent of the world’s aged and more than three times the numbers of the aged in the whole

of Europe. This emphasizes the very high growth rate of the aged in less developed regions – 3.1 per cent annually 2000–2050 – with a doubling time of 23 years compared with 67 years for the total population of the less developed regions. In 2000, besides China and India, only 3 other developing countries had aged populations exceeding 5 million but in coming years

the great majority of new additions to the group will be from developing regions (Table 3.4).

Meanwhile the aged population of the more developed regions has a projected growth rate of 1.2 per cent per annum 2000–2050, which corresponds to a doubling time of 56 years. This growth rate is slower than in the last half of the twentieth century (1.8 per cent, doubling time 39 years) but nonetheless represents a considerable challenge for societies, one amplified by particularly high growth rates among the old-old and the oldest old. Europe – especially Russia and Germany – and the United States will continue to have by far the largest aged populations in the more developed regions.

Comparing Tables 3.3 and 3.4, there is only partial overlap between the countries with the highest percentages and highest numbers of the aged. In 2000, countries with relatively high figures for both were the most populous European countries (Italy, Germany, Spain, France, United Kingdom, Ukraine and Russia) together with Japan and the United States. By 2050, more than 20 developing countries, together with Australia and Canada, could also be among the countries with both relatively high numbers and percentages.

Containment of the numbers of the aged in developing countries in the second half of this century will depend on minimizing the duration of above replacement fertility through family planning and reproductive health policies. In developing countries, population policies addressing high birth rates and high rates of population growth will have important benefits in curtailing the long run expansion of the numbers of the aged, as well as total population numbers. Ironically, at the same time, developed countries at risk of hyper-aging will need effective pronatalist policies, or the unlikely event of a revival of familism, to raise their fertility rates closer to replacement level. Numerical increases create mounting demands on pension systems, health services and social welfare systems in developed countries, while in developing countries much of the responsibility falls on families.

Growth in the size of the aged population is generally the immediate concern in both developed and developing countries. In the former there are expectations that policies and programs will respond quickly to changing numbers nationally and locally and only in the longer term to structural changes due to shifts in the overall representation of older age groups. For example changes in the number of people moving through

the age structure of the society or community drives the nature of the market for goods and services and the demand for housing and community infrastructure, as well as the need for income maintenance, health services and aged care. Furthermore, numbers influence not only the burden of care for the disabled and frail aged, for whom families and communities have continuing responsibility but also the availability of family and community resources in the form of healthy older people – who can support others and contribute to economic and social life through paid and unpaid work.

Priorities for policy makers in developing countries inevitably differ partly because some consider aging to be a “luxury” for rich countries; rapid population growth, urbanization and economic and social development loom as more pressing issues. Poverty, malnutrition and lack of shelter and health care are the most prevalent problems besetting those who grow old in developing countries. These problems are often indistinguishable from the problems of the population at large and, for this reason, there has been resistance to making special provision for them (Rowland 1994). In developing countries, family care has an expanded role because of the scarcity of state-funded pensions and services. Yet although family support for the aged is regarded there as “traditional”, low rates of survival in the past meant that only a small proportion of families included older relatives. Families now face mounting difficulties in fulfilling this role, for instance because of the rising labor force participation of women and the separation of relatives through inter-regional migration (Myers 1995: 263). In such circumstances, progress depends on integrating concerns for young and old, which may also assist in facilitating a redistribution of public expenditure between them as the age structure changes (United Nations 1988: 31). Encouraging this will be the mounting political weight of the elderly: for instance, where they comprise a quarter of the total population, they will comprise an even higher proportion of eligible voters.

Generational Changes

In aging populations, generational changes, or changes in the relative sizes of younger and older age groups, have further implications for the ability of societies to maintain themselves. Coming decades

will witness dramatic shifts in indicators of this, namely the aging index [the ratio of the aged (65+) to children (0–14); National Institute on Aging 1998] and the aged dependency ratio [the ratio of the aged to persons of working age (15–64)]. Table 3.5 presents a summary of these indices for countries where the aged comprised 15 per cent or more of the population in 2000, or 20 per cent in 2050: the higher cutoff was made necessary by the much larger number of aging populations at the latter date. A paradox confronting many developed countries is continuing growth in the numbers of the aged in conjunction with present or prospective overall population decline. Large cohorts continue to rise up the age structure “escalator” while below replacement fertility results in falling numbers of children and new entrants to the labor force.

Even in the year 2000 Southern European countries and Japan already had appreciably more older people than children, as shown by aging indices greater than 115:100 (Table 3.5). Eight other European countries also had relatively high aging indices, above 80, compared with 57 for the United States. The statistics for 2000, however, only mark the beginning of the shift towards the situation where the aged outnumber children. Projected figures for 2050 suggest that ratios in excess of 250 aged per 100 children could develop in Japan and parts of Southern Europe (Spain, Italy, Greece and Slovenia) and Western Europe (Austria, Germany and Switzerland). In many other countries as well, the number of the aged could be double, or nearly double, the number of children. Lower aging indices may persist in the United States, Australia and New Zealand but even in these countries the aged are projected to outnumber children by a substantial margin in 2050 (Table 3.5).

Overall, the aged in more developed regions could exceed the number of children by about 172:100 in 2050. Of itself, the contracting size of the child generation is unlikely to free up sufficient extra resources – for example from the funding of primary and secondary education – to offset the extra costs of a much larger generation of the aged. An early estimate for OECD countries indicated that per capita public expenditure on persons aged 65 and over in more developed countries was three times higher than for children under 15 (Holzmann 1988: 430). A later estimate found that a child absorbs more resources than an old person, with the result that the first

20 years of life cost more than the total years lived after 60. Combining public and private expenditures, children appear more expensive per capita. This implies that the decreased cost of supporting children is offsetting the increased cost of supporting the aged. Yet much of the decreased cost of children will be a saving in private expenditure, which the taxation system cannot easily redirect to the aged (Easterlin 1996). In less developed regions, a more favorable aging index is projected to persist, although the figure of 64:100 also renders less viable the diversion of extra resources to the aged.

The so-called aged dependency ratio (Table 3.5) helps to illustrate the mounting difficulty of raising sufficient tax revenue from people of working age to support the elderly, despite the ratio’s many disadvantages (see National Research Council 2001: 42; Rowland 2003: 89–90). Like the aging indices, aged dependency ratios are useful indicators of changes in the relative numbers in broad age groups. The ratio of older people to “workers” is particularly relevant to issues surrounding the economic sustainability of population aging. The model of the demographic transition shows that aged dependency peaks in the post-transition stage at 30 older people per hundred of working age. However, the effects of below replacement fertility, as exemplified in World Bank projections for Italy to 2050, could increase the aged dependency ratio to 60 (Table 3.1).

Worldwide, the aged dependency ratios are projected to more than double in the first half of this century, from 11 to 25 aged per 100 workers (15–64) (Table 3.5). Similarly, those for more developed regions show a rise from 21 to 47 over the same period. Still higher ratios, between 61 and 74, are possible by 2050 in Southern European countries and Japan (Table 3.5). All of these figures denote major changes, especially considering that many people of working age are not in the labor force. More favorable ratios are projected for the United States, Australia, New Zealand and China. Nonetheless, their aged dependency ratios, which will be appreciably higher by 2050 than they are now, have already prompted policy initiatives.

The United States and Ireland are the only countries with aged populations in 2050 that will have more people in the labor market entry ages (15–24 years) than in the labor market exit ages (55–64 years). This is shown by the labor market entry-exit ratios (LMEER)

Table 3.5 Indices of generational change in the oldest populations, 2000 and 2050

	2000			2050			
	Aging index (aged per hundred 0–14)	Aged dependency ratio (aged per hundred 15–64)	Labour market entry-exit ratio (15–24 per hundred 55–64)	Aging index (aged per hundred 0–14)	Aged dependency ratio (aged per hundred 15–64)	Labour market entry-exit ratio (15–24 per hundred 55–64)	
<i>Global Summary</i>							
World	23.1	10.9	267.1	74.6	24.7	124.5	
More developed regions	78.2	21.2	132.1	172.5	46.5	80.8	
Less developed regions	15.5	8.2	327.5	64.4	21.8	132.1	
Africa	7.6	6.0	503.0	24.6	10.6	244.4	
Asia	19.4	9.2	284.0	85.3	26.1	108.1	
Europe	84.2	21.7	130.7	209.4	51.4	68.3	
Latin America and the Caribbean	17.2	8.6	346.8	84.6	26.9	115.5	
Northern America	57.4	18.6	154.6	116.7	35.5	100.9	
Oceania	38.8	15.2	197.6	93.0	28.8	119.4	
<i>Oldest Populations (15 per cent or more 65+)</i>			<i>Oldest Populations (20 per cent or more 65+)</i>				
Italy	126.5	26.7	98.3	Spain	330.0	73.8	64.1
Greece	116.5	26.0	120.8	Japan	290.9	71.3	76.9
Sweden	95.8	27.1	99.9	Italy	313.0	68.1	66.3
Japan	116.8	25.2	98.0	Slovenia	280.0	65.9	59.3
Belgium	98.4	25.9	118.0	Greece	259.9	64.6	71.0
Spain	115.2	24.8	143.0	Austria	294.4	62.5	61.6
Germany	105.6	24.1	84.0	Czech Republic	241.2	60.8	61.4
Bulgaria	102.4	23.7	128.8	Switzerland	254.4	57.3	66.8
Switzerland	96.1	23.8	91.4	Germany	249.9	54.7	68.1
France	85.3	24.5	140.9	Sweden	217.4	54.5	64.7
United Kingdom	83.0	24.1	116.4	Bulgaria	217.8	53.7	57.5
Portugal	93.5	23.1	136.9	Portugal	207.1	53.5	83.4
Austria	93.6	22.9	103.3	Armenia	239.6	50.0	42.6
Norway	77.9	23.7	124.7	Hong Kong	210.9	51.3	79.1
Denmark	82.2	22.5	97.8	Bosnia & Herzegovina	225.3	50.4	57.7
<i>Selected Comparisons</i>			Belgium	204.6	51.2	76.4	
Netherlands	74.6	20.1	115.5	Hungary	201.1	51.2	65.7
Russia	69.6	18.0	160.4	Slovakia	219.0	49.8	59.7
Canada	65.9	18.5	145.1	Lithuania	197.3	51.0	58.9
Australia	59.7	18.2	155.3	Ukraine	221.9	49.2	51.5
United States	56.6	18.6	155.7	Singapore	206.2	49.8	76.5
			Latvia	187.8	49.6	55.6	
			Poland	177.1	49.5	67.2	
			Finland	185.4	48.8	78.2	
			Russia	204.7	47.1	54.5	
			Georgia	190.9	47.3	61.5	
			South Korea	166.6	48.8	93.2	
			United Kingdom	182.3	47.3	79.3	

Table 3.5 (continued)

2000			2050		
Aging index (aged per hundred 0–14)	Aged dependency ratio (aged per hundred 15–64)	Labour market entry-exit ratio (15–24 per hundred 55–64)	Aging index (aged per hundred 0–14)	Aged dependency ratio (aged per hundred 15–64)	Labour market entry-exit ratio (15–24 per hundred 55–64)
		Cuba	175.8	47.1	80.3
		Belarus	183.9	46.0	59.6
		France	167.1	46.7	93.5
		Netherlands	180.0	45.0	81.3
		Norway	162.9	45.3	88.4
		Macedonia	184.1	43.7	63.7
		Romania	163.8	44.6	71.5
		Denmark	170.5	43.8	87.1
		Trinidad and Tobago	156.7	44.4	78.7
		Yugoslavia	165.1	41.8	71.6
		Croatia	149.6	41.0	89.2
		Canada	148.8	40.9	88.3
		Azerbaijan	157.0	38.8	57.6
		Moldova	153.8	38.5	60.9
		New Zealand	135.1	38.5	90.4
		China	139.1	37.2	80.3
		Australia	126.8	37.5	99.8
		Puerto Rico	130.1	36.2	96.1
		Ireland	115.1	37.2	107.8
		Sri Lanka	123.0	34.7	95.1
		Thailand	123.1	34.1	99.8
		United States	113.8	34.9	102.2
		Réunion	118.3	33.1	97.7
		Mauritius	116.4	32.6	93.9

Source: Calculated from United Nations (2001b).

in Table 3.5. For many countries, the ratios foreshadow considerable ongoing changes because the effects of annual imbalances between labor force entries and exits will cumulate for decades. Thus the marked excess of labor market exits in a single year need to be interpreted in the context of a similar situation persisting and deepening over time. In a small number of countries in the year 2000 – Germany, Switzerland, Denmark, Japan and Italy – the numbers in the exit ages already exceeded those in the entry ages, particularly in Germany where there the LMEER was only 84:100 and shortages of skilled labor are already apparent. For the more developed regions as a whole there were still

132 entrants per 100 exits in 2000, compared with 328 in the developing regions (Table 3.5).

By 2050 the imbalances would be severe if the United Nation's medium variant projections match actual experience. The projections show that low ratios – of less than 70 entrants per 100 exits – would be prevalent among Europe's oldest populations, with some particularly low ratios in Russia and other parts of Eastern Europe. The LMEERs for 2050 are a prime example of projections demonstrating a future to be avoided: the disadvantages of such imbalances in population dynamics are of great significance for national economies.

Age Structures

Underlying all of the shifts in the numbers and percentages of the aged, as well as in the various indices of aging, are the actual changes in national and regional age structures. Examination of these shows the processes at work, enables comparisons between national and regional trends through time and permits generalizations about the past and future of population aging. This section discusses trends in national and regional age structures at four points in time – 1950, 1975, 2000 and 2025. These four “slices” provide a manageable summary of developments in each area over a seventy-five year period; they reflect the cumulative effects of past changes and features that will influence future experience. Projections for 2050 are not included in this more detailed analysis because they are inevitably much more speculative than those for 2025.

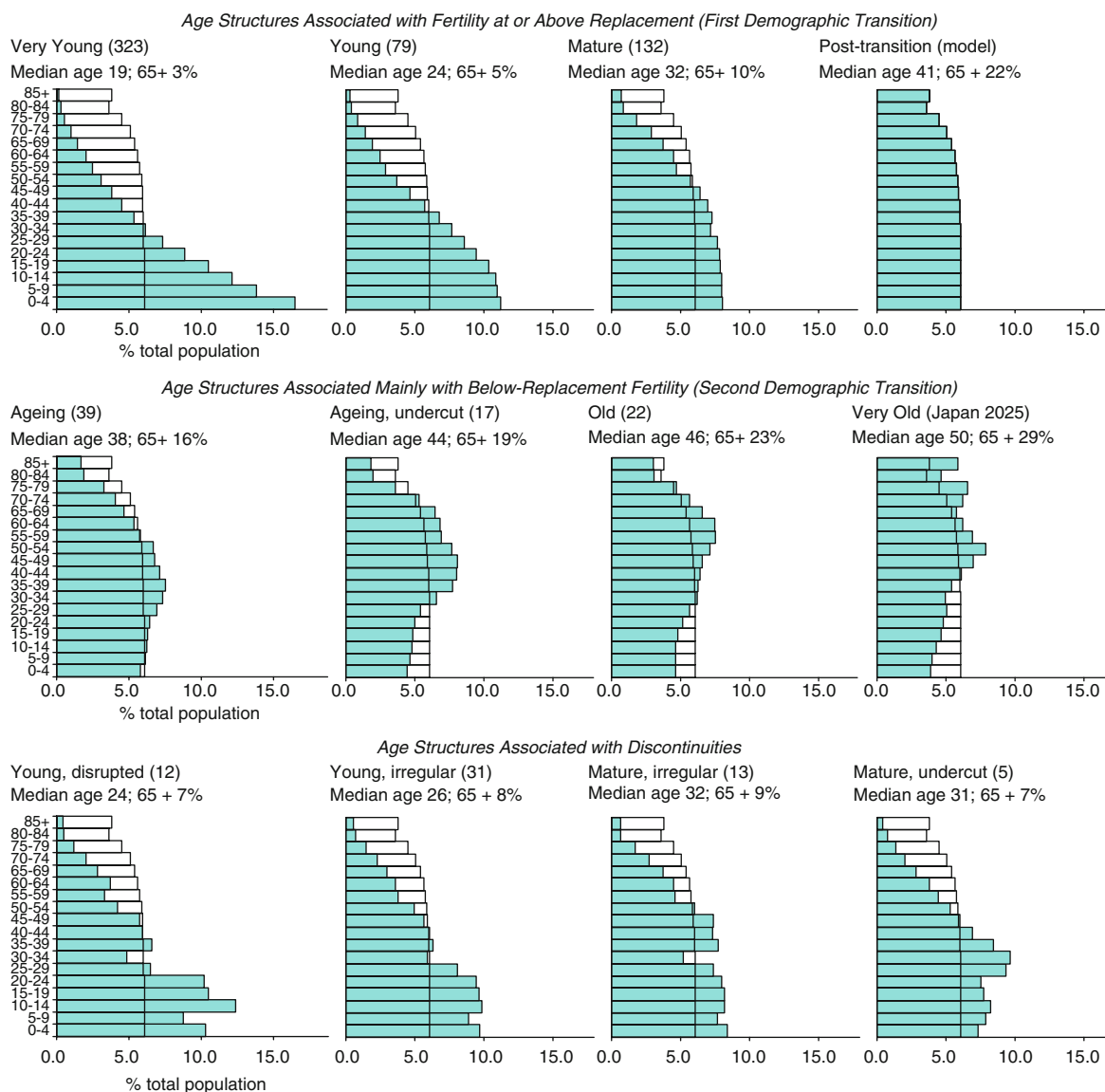
The data are United Nations estimates for 1950, 1975 and 2000, together with medium variant projections for 2025 (United Nations 2001b). The figures consist of percentages, for both sexes combined, in five year age groups from 0–4 to 85+ for United Nations regions and countries with populations of a million or more in 2000. Small populations are omitted because they are more likely to have unique patterns of age structure change associated with relatively low numbers and variations in migration flows, as in island nations of the Pacific and the Caribbean. A classification of the age structures, based on a cluster analysis, grouped similar age structures and summarized the data. The classification identified 10 groups with 5 or more cases, each denoting a distinctive type of age structure (Fig. 3.1). Remaining were 7 ungrouped cases (including Japan) and three groups with less than 5 cases, which are not given separate coverage here. Two-thirds of the 688 age structures were in just two groups, because of marked similarities between many national age structures in developing countries through time.

Types of Age Structures

Figure 3.1 presents the results of the classification in terms of age structures associated with (i) above

replacement fertility, (ii) below replacement fertility and (iii) discontinuities in age structure change, such as baby booms. Statistics on median ages and the percentages 65 and over accompany each age structure, together with the number of cases in each group. The classical demographic transition is relevant to the sequence of change in the first set of age structures, which derive especially from the experience of developing countries. In the demographic transition, while birth and death rates fall, age structures evolve from triangular to more rectangular forms, as in the first row of Fig. 3.1. The transition has a theoretical end point in the “post-transition” stage, where a new balance between birth and death rates produces zero growth but it is notable that no country has reached it, either because population aging is still in progress in the context of above-replacement fertility, as in the United States and Ireland, or because birth rates have declined below replacement level, as in much of Europe.

The theoretical limit of age structure evolution for the first demographic transition is shown by the model population on the right of the first row of Fig. 3.1: it has replacement level fertility and zero growth. The shape of a post-transition age structure, if it existed, would vary according to the life expectancy reached at the end of the transition: the higher the life expectancy, the higher the ultimate percentage in the older ages. The post-transition age structure depicts a long-lived population, with life expectancies of 85 for females and 79 for males, which is consistent with current prospects – compared with 75 for females in the original, classical transition (Table 3.1). The model has a median age of 41 years, which is below the median age for most of the age structures associated with below-replacement fertility. It represents what is, demographically, most sustainable in the long-term – because it avoids problems of growth and decline, maintains a balance between the numbers in different generations and avoids excessive aging. Its profile is superimposed on the others in Fig. 3.1 to provide a benchmark for comparisons. The model draws attention to deficits and surpluses in particular age structures. Compared with the model population, the types of age structures associated with above-replacement fertility have relatively high proportions in the young ages, a situation currently forewarning of substantial future rises in the numbers of older people.



Note. The figures in brackets show the number of age structures of each type. There were 172 countries and regions in the classification, giving a total of 688 age structures; 15 age structures were ungrouped or belonged to groups of less than 5.

Source: Cluster analysis of data from United Nations, *World Population Prospects*, 2000 Revision.

Fig. 3.1 Main types of national and regional age structures, 1950, 1975, 2000 and 2025

In contrast, the age structures in the middle row emphasize that below replacement fertility creates deficits in the child ages and raises the percentage of older people. Deficits can flow on to the labor force and family formation ages, inducing a cycle of self-perpetuating decline. Whereas the first demographic transition forecast that national age structures would converge to a rectangular form, the second demographic transition foreshadows diversity among the oldest populations, depending on the extent to which

their age profiles are undercut. In the second demographic transition, the structures of the oldest populations vary depending on how far fertility falls and how much life expectancy rises. There is no specific end point to these changes because the situation is inherently unstable; the potential for change ranges from moderate rejuvenation to extreme decline. An emerging prospect for many developed countries is a long-term struggle to maintain demographic viability. Most regions of the Western world had mature or aging

profiles in 2000 and are projected to have mainly old profiles in 2025. The oldest population in the data set, Japan in 2025, has a median age of 50 years, and an “up-side-down”, v-shaped, age pyramid, which highlights the severe population aging effects of below-replacement fertility. The classification procedure did not group Japan’s projected 2025 age structure with any others but it is included in Fig. 3.1, at the end of the middle row, to show the structure of the oldest population.

Countries in the midst of the second demographic transition currently have high potential for growth in both the numbers and the percentages of older people although, ultimately, the numbers may decline. Conversely, countries that are still only part way through the first demographic transition have very high potential for growth in their numbers of older people.

Besides conforming to trends anticipated from the first and second transitions, national and regional age structures can also reflect discontinuities in demographic evolution. The classification identified four types of profiles associated with discontinuities (Fig. 3.1). These have arisen partly from the effects of baby booms, migration booms and fertility control policies and partly from wars and other calamities leading to episodes of heightened mortality and refugee movements. Uncertainties and inaccuracies in data for populations affected by war or civil disorder would have also contributed to irregularities, as in estimates for European countries in 1950 and some African countries at later dates. Also, illiterate people often do not know how old they are and this becomes more common at later ages. The age structures reflecting discontinuities are shown in the third row of Fig. 3.1; they belong to four groups:

- First, the “young, disrupted” type occurred only in former Soviet Republics, mainly in Western Asia in 1950 and 1975 and was associated with the impact of war losses, social disruption and relatively high fertility.
- Second, the somewhat similar “young, irregular” type characterized many other age structures in Eastern Europe in 1950 and 1975. Losses in the adult population again made truncation a factor in the development of this type of age structure. Yet the same type of profile arose also in the context of rejuvenation through baby booms due especially to earlier and more universal marriage and childbearing. Similarly the “young, irregular” age structure was conspicuous

in 1975 in baby boom-affected countries in Western Europe together with the United States, Canada, Australia and New Zealand. The same type of age structure occurred as well in Israel in 1975 and 2000 as a consequence of immigration and high birth rates. All age structures of this type were weighted to the younger ages, although not necessarily with a single pronounced step below 30–34.

- Third, the “mature irregular” age structures occurred in 1950 in war affected countries of Europe, including France, Belgium, Germany and Austria, as well as in parts of Eastern Europe in 1950 and 1975.
- Finally, the “mature undercut” profile appeared only in the year 2000 and arose from accelerated fertility decline. It was characteristic in the United Nations region of East Asia, notably China and South Korea.

Table 3.6 shows the results of the classification for United Nations Regions. Within regions, the patterns of national age structure change conform to the regional pattern in some cases but not in others. Diversity arises particularly where trends have departed from the demographic transition, that is where there has been a prolonged baby boom, very low fertility, or civil disruption – as discussed above. The examples of national age structure trends in Table 3.7 reveal some of this diversity. The table includes countries which, in 2000, had the oldest age structures, or the largest aged populations, as well as some others of interest for comparison.

It is emphasized that the classification does not reveal the full extent of diversity because it collapsed the whole range of structural variations into groups of profiles that most resembled each other. This means that the average age structure for each group is not identical to particular national age structures within the group. Diversity within groups was partly addressed by providing more detail for two of the advanced stages of the population aging process; thus the “aging” and “old” groups were split according to whether each population’s percentages 65 and over were at or below the mean for the group, (aging I, old I) or above the mean (aging II, old II). This highlights, for example, the relatively high levels of aging already developing in Southern and Western Europe, as well as in their constituent countries.

Table 3.6 Summary of age structure changes in United Nations regions, 1950–2025

United Nations region	1950	1975	2000	2025
World	very young	very young	young	mature
More developed regions	mature	mature	aging I	old I
Less developed regions	very young	very young	young	mature
Less developed regions excluding China	very young	very young	young	mature
Less developed regions excluding the least developed	very young	very young	young	mature
Least developed regions	very young	very young	very young	very young
Sub-Saharan Africa	very young	very young	very young	very young
Africa	very young	very young	very young	very young
Eastern Africa	very young	very young	very young	very young
Middle Africa	very young	very young	very young	very young
Northern Africa	very young	very young	young	mature
Southern Africa	very young	very young	young	young
Western Africa	very young	very young	very young	very young
Asia	very young	very young	young	mature
Eastern Asia	very young	very young	mature, undercut	aging I ¹
South-central Asia	very young	very young	young	mature
South-eastern Asia	very young	very young	young	mature
Western Asia	very young	very young	young	mature
Latin America & the Caribbean	very young	very young	young	mature
Caribbean	very young	very young	young	mature
Central America	very young	very young	young	mature
South America	very young	very young	young	mature
Europe	mature	mature	aging I	old I
Eastern Europe	young, irregular	mature, irregular	mature	aging, undercut
Northern Europe	mature	mature	aging I	old I ¹
Southern Europe	mature	mature	aging II	old II
Western Europe	mature, irregular	mature	aging II	old II
Northern America	mature	young, irregular	aging I	aging II
Oceania	mature	young, irregular	mature	aging I
Australia/New Zealand	mature	young, irregular	aging I	aging II
Melanesia	very young	very young	very young	young
Micronesia	(very young) ²	very young	very young	young
Polynesia	very young	very young	young	mature

Notes: ¹ The “aging” and “old” groups were split where the percentages aged 65 and over were at or below the average for the group (aging I, old I) and above the average (aging II, old II).

² This age structure was ungrouped but was similar to the “very young” age structure, except for a particularly low representation of the aged.

³ The countries comprising each region are shown in the tables in the data source.

Source: Cluster analysis of age structures from United Nations (2001b).

Changes Through Time

The world’s recent pattern of age structure change (Table 3.6) confirms that global population aging was a late development. The relatively recent, dramatic shift in the weight of population numbers towards the developing countries, due to the population explosion

of the 1950s and 1960s, has meant that global trends are now largely determined by processes in developing, rather than developed regions. This is underscored by the fact that the age structure trends in the “less developed” regions are the same as for the world as a whole, with “very young” profiles giving way to “young” by 2000 and “mature” by 2025 (Table 3.6). Yet despite progress through the demographic transi-

Table 3.7 Examples of age structure changes in selected national populations, 1950–2025

Countries	1950	1975	2000	2025	Per cent 65+2000	Pop. 65+2000 (millions)
<i>Oldest populations (>=15 per cent 65+)/largest aged populations (>= 5 million 65+) in 2000</i>						
1 Italy	mature	mature	aging II	old II	18.1	10
2 Greece	young, irregular	mature	aging II	old II	17.6	2
3 Sweden	mature	mature	aging II	old II	17.4	2
4 Japan	very young	mature	aging II	very old	17.2	22
5 Belgium	mature, irregular	mature	aging II	old II	17.0	2
6 Spain	mature	mature	aging II	old II	17.0	7
7 Germany	mature, irregular	mature	aging II	old II	16.4	13
8 Bulgaria	young, irregular	mature	mature	aging, undercut	16.1	1
9 Switzerland	mature	mature	aging I	old II	16.0	1
10 France	mature, irregular	mature	aging I	old I	16.0	9
11 United Kingdom	mature	mature	aging I	old I	15.8	9
12 Ukraine	young, irregular	mature, irregular	mature	aging, undercut	13.8	7
13 Russia	young, irregular	mature, irregular	mature	aging, undercut	12.5	18
14 United States	mature	young, irregular	aging I	aging II	12.3	35
15 Brazil	very young	very young	young	mature	8.8	5
16 China	very young	very young	mature, undercut	aging I	6.9	87
17 India	very young	very young	young	mature	5.0	50
18 Indonesia	very young	very young	young	mature	4.8	10
19 Pakistan	very young	very young	very young	young	3.7	5
<i>Selected Comparisons</i>						
Netherlands	mature	young, irregular	aging I	old I	13.5	2
Canada	mature	young, irregular	aging I	old I	12.6	4
Australia	mature	young, irregular	aging I	aging II	12.3	2

Note: The “aging” and “old” groups were divided into populations with percentages aged 65 and over that were at or below the average for the group (aging I, old I), or above the average (aging II, old II).

Source: Cluster analysis of age data (standardized) from United Nations (2001b).

tion, by the start of the twenty-first century fertility decline had made little impact on the age structures of many countries. On the contrary, the rejuvenating effect of lower infant and child mortality more than offset tendencies towards population aging. Thus, very young age structures persisted in the least developed regions in 2000, including sub-Saharan Africa, and are projected as well for 2025, assuming that the HIV/AIDS epidemic does not seriously alter this outcome (see National Research Council 2001: 49–50). Although many populations have aged only slightly in percentage terms, growth in the numbers of the aged is accumulating rapidly in the less developed regions. For example, the still young populations of Brazil, Indonesia and Pakistan (Table 3.7) already include high numbers of older people and these countries appear destined to have some of the world’s largest aged populations by mid-century.

Meanwhile, the more developed regions had mature profiles in 1950 and 1975, leading to aging and old

profiles in 2000 and 2025 respectively. The recent history of more developed regions reveals the cycle of heightened aging, associated with the crossover from the first to the second demographic transition. When populations with “mature” age structures experience sustained below replacement fertility, undercut and rapidly aging profiles soon emerge.

These broad regional trends are repeated on a continental scale and to some extent in subregions of continents. Thus, for Africa as a whole, very young age structures are present at all four dates. This pattern characterizes most of Africa’s subregions, except for the north and the south and reflects persistent high birth rates (TFR 5.1 in 2005). In Southern Africa and Northern Africa – which extends from Morocco to Egypt – population aging is emerging and the age structure trends resemble those for the world as a whole. The two regions have lower fertility than the rest of Africa, as do their two most populous countries, namely Egypt (TFR 3.2 in 2005) and South Africa (TFR 2.8 in 2005).

Similarly, in Asia and most of its subregions the overall pattern of age structure change is the same as the global pattern. The exception is Eastern Asia where rapid aging became apparent after 1975 (Table 3.2). China is by far the most populous country in Eastern Asia and inevitably dominates in determining the region's overall population trend. Thus in Eastern Asia, with a population of 1.5 billion in 2005, the pattern of change is the same as for China's population of 1.3 billion (Tables 3.6 and 3.7). China's unforeseen switch from a very young population in 1950 and 1975 to a "mature undercut" profile in 2000 resulted from the impact of the country's family limitation policies, especially the "Later-Fewer-Longer" campaign and its successor, the One Child Policy (see Tien et al. 1992: 18ff). Demographic shock waves inherent in the present age structure of China entail huge increases in the population of working age until the early 2020s, followed by massive increases in the older ages. These shocks to age structure evolution are moving China and Eastern Asia into the pattern of age structure change associated with the second demographic transition, although the main causes of change are different.

Japan (with a population in 2005 of 128 million), the next most populous country in East Asia, is ahead of China in terms of aging, because its rapid fertility decline after the Second World War brought an early start to its experience of age structure changes associated with below replacement fertility. Asia also includes the world's other demographic giant of India, whose population in 2005 was 1.1 billion. India dominates population trends in the south central region of Asia (Tables 3.6 and 3.7). Together, China and India comprised 37 per cent of the world's total population in 2005.

The United Nations region of Latin America and the Caribbean and all of its constituent subregions, also had the same pattern of age structure evolution between 1950 and 2025 as the "less developed regions" and the world as a whole (Table 3.6). Mexico (2005 population = 107 million) and Brazil (184 million) account for more than half of Latin America's population. Eastern Asia is the only region out of all of Asia, Latin America and Africa where population aging is conspicuous at the macro level.

Europe's pattern of age-structure change corresponds to that of the "more developed regions" overall. Its "mature" age structure in 1950 and 1975 was that

projected for much of Asia and Latin America in 2025. After 1975, Europe underwent a shift towards rapid aging associated with low fertility. The decline in birth rates produced "aging" profiles in 2000, while the projections envisage an intensification of aging through the emergence of "old" age structures. Europe's population in 2005 (730 million) was little more than half the size of China's but in coming decades Europe is likely to have some of the world's highest percentages in older ages. Unless policies or social changes intervene, its age structure will develop a high inherent momentum of decline.

All regions of Europe are aging quite rapidly. Whereas Northern Europe's pattern of age structure change is the same as that for the sub-continent overall, Southern and Western Europe both have somewhat older age structures in 2000 and 2025. Yet even by the latter year, the process of population aging will still have much further to progress. Beyond 2025, the already protracted period of very low birth rates in Italy, Greece and Spain is projected to place these countries in a new group with more than a third of their populations in the older ages. Setting the stage for this was the early appearance, in 2000, of "aging II" age profiles in these countries. Following close behind Southern Europe's rapidly aging populations are Sweden, Belgium, Germany and Switzerland (Table 3.7). France, the United Kingdom and the Netherlands are evidently aging more slowly, because they were classified as having "aging I" and "old I" age structures in 2000 and 2025 respectively, that is their percentages 65 and over were no more than the average for these groups.

Like Eastern Asia, Eastern Europe has had a distinctive experience of age structure change and aging (Table 3.6). Its "young irregular" and "mature irregular" profiles in 1950 and 1975 were the net outcome of turbulent national histories, including the effects of World War II, subsequent refugee movements and continuing political oppression and upheaval. Peaks and valleys in Eastern Europe's age structures have generated sharp changes in the numbers advancing from one age group to the next. Despite these circumstances, fertility in Eastern Europe remained relatively high over this period (TFR 2.9 to 2.2) and even in 2000 the region's age structure was still mature. The shift to an "aging undercut" age structure by 2025, is indicative of an acceleration of aging associated with low fertility bringing heightened demographic stresses because

of a falling representation of children and people in the reproductive and working ages. Bulgaria, Ukraine and Russia each have this type of profile projected for 2025 (Table 3.7).

A further regional variation in the trend towards older age structures applies to Northern America and Oceania, both of which are experiencing a relatively slow pace of population aging. As in Europe as a whole, the two regions' largest constituent countries – United States, Canada and Australia – had mature age profiles in 1950 but underwent rejuvenation as a result of protracted baby booms, leading to “young irregular” profiles in 1975. Their profiles for 2000 were “aging”, as in Europe but remain “aging” in 2025, instead of progressing to an “old” age structure. This reflects assumptions that birth rates will remain above European levels and that there will continue to be significant net inward migration of young people, which has a moderate restraining influence on aging.

While the pattern of age structure change for Oceania is dominated by the region's most populous country, Australia, demographic diversity resulting from the presence of younger island states elsewhere in Oceania has meant that the pattern for the total regional population is unrepresentative of the subregions, apart from Australia/New Zealand. Like much of Africa and the least developed regions generally, Melanesia and Micronesia had very young populations from 1950 to 2000 but are projected to have “young” populations in 2025. Micronesia is the least populous of all the United Nations regions (population 2000 = 0.5 million); in 1950 the presence of American military personnel there on the island of Guam had a considerable impact on its overall age structure. Polynesia had very young populations in 1950 and 1975 but has been aging since then in a similar pattern to that of Asia. Lower birth rates, together with the high volume of outward migration of families and young people to Australia, New Zealand and the United States, underlie the aging of Polynesia.

Adapting to Population Aging

Policy Principles

Although the extremes of population aging lie in the future, a long lead time is necessary to seek to avert

adverse consequences, especially the emergence of high levels of aging. For example:

Over the coming decades, the decisive shift to an older age structure in Europe will challenge social security and health systems, may hinder productivity gains, and could affect global competitiveness and economic growth. It could also strain relations among generations, particularly between those who are on the contributing and receiving ends of public transfer programs. It may also diminish social cohesion, particularly if increasing labor demand leads to substantial immigration from other cultures. (Lutz et al. 2004: 306)

In developed countries, current projections of unfavorable futures are the starting point for forward-looking policy initiatives addressing a range of concerns including support for motherhood and family formation, the provision of health services and care of the aged and strategies for averting labor shortages and shortfalls in pension funding. In some developed countries there has already been a long period of development of policy goals and strategies for adapting to population aging, which means that future initiatives now have a foundation in the policies of the societies that have been most proactive in this area. Policies are subject to continual innovations and modifications but comparisons of national approaches to meeting the challenges of population aging indicate considerable diversity in degrees of preparedness for change (see OECD 1996; National Research Council 2001: Chapter 3).

Yet emerging from past experience and research are broad policy principles that have received recognition internationally. A major statement of these is the Political Declaration of the Second World Assembly on Ageing, held in Madrid in 2002 under the auspices of the United Nations (United Nations 2002b). This built on work initiated twenty years earlier in Vienna at the First World Assembly on Ageing, which focused world attention on aging as a major phenomenon and drafted the first International Plan of Action on Ageing.

The Political Declaration set out guiding principles in 19 paragraph-length Articles. Several Articles (1, 3 and 19) of the Declaration emphasized a commitment to “the development of a society for all ages” – which had been the theme for the 1999 International Year of Older Persons (United Nations 2002b: 7). The Declaration also called for “actions at all levels, including national and international levels, on three priority directions: (i) older persons and development,

- (ii) advancing health and wellbeing into old age and
 - (iii) ensuring enabling and supportive environments’
- (United Nations 2002b: 1):

The priority directions are designed to guide policy formulation and implementation towards the specific goal of successful adjustment to an ageing world, in which success is measured in terms of social development, the improvement for older persons in quality of life and in the sustainability of the various systems, formal and informal, that underpin the quality of well-being throughout the life course (United Nations 2002b: 8).

Further Articles in the Political Declaration elaborated these priorities. The content of many of the Articles overlapped with that of several others and covered a broad agenda, among which the most prominent are outlined below. While headings are used here for summary purposes, they were absent from the Political Declaration. Also, the Declaration evidently avoided ambiguity and controversy about the meaning of summary concepts by making no specific reference to any, apart from “quality of life”.

1. *Social Integration*. Eliminate age discrimination and neglect, promote increased opportunities for older persons to remain independent, realize their potential and participate fully in all aspects of life (Articles 2, 5, 6, 12 and 14). While the Declaration did not mention “social integration”, the ideas here relate to this important concept in gerontology (see Rosow 1967; Pillemer et al. 2000).
2. *Health*. Seek to achieve realization of the right to enjoyment of the highest standard of physical and mental health. This requires action in other social and economic sectors besides the health sector as well as policies concerned with care and treatment, supportive environments and promotion of healthy lifestyles (Articles 5, 6 and 14). Discussion of national policies sometimes refers to these goals under the heading of “healthy aging” (Andrews 2001; Howse 2005), although achievement of this depends substantially on the experience at younger ages of healthy lifestyles and access to adequate health care.
3. *Productivity*. The Declaration emphasized the great potential contribution of older people to future development. It stated that they should have the opportunity to work for as long as they wish and are able to, in satisfying and productive work, continuing to have access to education and training programs. The Declaration also recognized their

important role as caregivers (Articles 10, 12 and 14). A narrower concept of “productive aging” has entered into policy discussions to highlight contributions to the society and economy by older people but adaptations to population aging also require general attention to productivity from the start of working life.

4. *Quality of life*. “Concerted action is required to transform the opportunities and the quality of life of men and women as they age and to ensure the sustainability of their support systems.” A gender perspective is needed in all policies and programs as well as particular concern for the vulnerable aged generally and for those in insecure or life-threatening situations (Articles 5, 6, 8, 9 and 12).
5. *Social and economic development*. Aging needs to be included in development agendas, in strategies to eradicate poverty and in efforts to achieve full participation in the global economy of all developing countries (Articles 5, 7, 8 and 10). Vital in developing countries is concern for social and economic development to alleviate and prevent poverty and hardship among the aged and the population generally.
6. *Implementation*. Governments bear primary responsibility for ensuring access to basic social services and leadership on aging matters. Furthermore, progress in the priority directions requires research to assist in the formulation of policies and calls for intergenerational solidarity and the support of families, volunteers, communities, organizations, corporations, workers, educational and religious institutions and the media. The roles of the United Nations and international co-operation are also vital (Articles 4, 6, 11, 13, 15, 16, 17 and 18). The range in the types of support regarded as necessary to the implementation of policies highlights the importance of action at different scales.

While the above summary is not exhaustive, it illustrates that there were major concerns common to a range of Articles in the Declaration. Notable omissions were any mention of population policies, including the advisability of avoiding excessive levels of population aging and unrestrained population growth. While these have been subjects of other forums, notably the World Population Conferences held in 1974 (Bucharest), 1984 (Mexico) and 1994 (Cairo), demographic objectives

have remained controversial in international policy debate. The nature of equitable and sustainable levels of fertility and population growth, so important in restraining expansion in the percentages and numbers of older people, remain matters of judgment for each society rather than open to international consensus.

Besides the Political Declaration, the Madrid conference also adopted a second document, The International Plan of Action, 2002, to implement the principles. This set out “recommendations for action”, arranged according to the three priority directions stated in the Political Declaration, together with strategies for “implementation and follow-up” (United Nations 2002b: 9–42). Summary concepts are also largely absent from this document, apart from quality of life, sustainable development and aging in place (see United Nations 2002b: 32 and 34). The document lists 117 actions to guide policy making and program development. It was intended to be “a practical tool to assist policy makers to focus on the key priorities associated with individual and population ageing.” (United Nations 2002b: 7). The Plan of Action also provides direction and standards for groups and organizations seeking to promote the welfare of older people and timely adjustment to demographic and social changes. For example, in relation to employment, the many recommended actions include raising labor force participation rates, removing disincentives for working beyond retirement age and flexible retirement arrangements (United Nations 2002b: 12–13). A substantial number of the suggested actions are especially pertinent to developing countries.

Kofi Annan (United Nations 2002b: 67), the then Secretary-General of the United Nations, summarized the overriding objectives of the Plan of Action as follows:

We need to recognize that, as more people are better educated, live longer and stay healthy longer, older persons can and do make greater contributions to society than ever before. By promoting their active participation in society and development, we can ensure that their invaluable gifts and experience are put to good use. Older persons who can work and want to should have the opportunity to do so; and all people should have the opportunity to continue learning throughout life.

By creating support networks and enabling environments, we can engage the wider community in strengthening solidarity between generations and in combating abuse, violence, disrespect and discrimination against older people.

By providing adequate and affordable health care, including preventive health measures, we can help older people maintain their independence for as long as possible.

The Plan envisaged that successful adjustment to an aging world could be measured in terms of social development, improvement in older people’s quality of life and the sustainability of formal and informal systems supporting wellbeing throughout life (United Nations 2002b: 8). Overall, the policy principles and objectives endorsed at the Second World Assembly on Ageing express in considerable detail many of the ideas from academic research and national policies. Implementation of policies at varied scales is less often emphasized but it is inherent in the diverse implications of individual and population aging. Initiatives supporting the welfare of the aged and of the population as a whole, need to be taken at different scales because there are inevitably varying priorities and approaches for each.

The question of scale in policy implementation provides a framework for the ensuing summary of approaches to adapting to population aging, especially in developed countries. Scale is considered here in terms of strategies at four levels: the society; the community, the family and the individual. Of necessity, multidisciplinary research underpins understanding of the issues at each level because of their scope and complexity. Demography makes its own contribution to such inquiry through its application of demographic concepts and theories and its focus on variations in demographic processes and characteristics as agents of change. The ensuing discussion highlights demographic aspects of adaptations to population aging.

Society

Funding of pensions, health services and aged care are leading economic concerns for aging societies (see Parts IV and VI), concerns that have been partly demographically driven in the past and are likely to be more so in the future if contraction of the base of age structures continues. At times, expenditure on pensions has increased independently of demographic change because of extension of eligibility for government-funded pensions and increases in their

real value. Some now predict, however, that opposite tendencies will emerge as pressure mounts on government budgets. Similarly, health care costs have escalated because of greater recourse to expensive medical technologies, for example, heart surgery, organ transplants, hip and knee joint replacements and wider prescription of expensive pharmaceuticals. In the United States, for example, the main determinants of future health care spending are expected to be medical technology, health policy and the organization of health care services, rather than the country's age structure (Uhlenberg 2005: 158).

Although demographic change is but one of the factors in the costs of aging, costs will be more manageable at the societal level if unfavorable population changes are constrained. In relation to population, the foremost policy issues for societies with aging populations are sustaining the age distribution – preventing it from being undermined – and maintaining the labor force in terms of its size, age distribution and human capital resources.

Theories about the causes of low fertility, including the second demographic transition (Lesthaeghe and Surkyn 2004), gender equity theory (McDonald 2000a, 2000b) and preference theory (Hakim 2000, 2001), provide insight into the reasons for the depletion of age structures and the scope for interventions to encourage higher birth rates. Second demographic transition theory is the most pessimistic of the three, because it foresees no end to very low fertility and accentuated aging. It argues that sub-replacement fertility is a product of structural changes in society and is, therefore, unlikely to be reversed unless post-materialist values take lower priority. Compared with the congenial equilibrium envisaged for the end of the first demographic transition, the second demographic transition anticipates bleaker prospects: “sustained sub-replacement fertility will cause extra aging and shake all welfare systems” (Lesthaeghe and Surkyn 2004: 19). A weakness of second demographic transition theory is that fertility in Europe is higher in the more liberal “post-materialist” societies than in the more traditional family cultures of Southern Europe, such as Greece and Italy – both of which had TFRs of 1.3 in 2005. By the logic of this theory, the reverse should be the case. For Southern European women, motherhood commonly means dropping out of the labor force – partly because it is expected in a patriarchal family system and partly because child care

facilities are scarce and it is difficult to return to an earlier job. In other words the opportunity costs of childbearing are high because of family role expectations and inflexible labor markets (Lesthaeghe and Surkyn 2004: 10).

Alternative interpretations of low fertility imply a somewhat more positive outlook for fertility, whether through an upward phase in tempo effects (Bongaarts and Feeney 1998), better gender equity in employment, or a reduction in other obstacles to childbearing. These last include the high cost of childcare and lack of flexibility in hours of work for parents with young children. Also, post-materialist values have not extinguished the materialist values and familist lifestyles that underlay the wide prevalence of two and three child families during the first demographic transition and still remain influential in the lives of many.

Gender equity theory argues that despite greater equity between men and women in access to education and employment, women still do the majority of household work and most of the childcare. Because of this situation, when women combine marriage with employment, in which there may be little allowance for their childcare responsibilities, the result is fewer births than they once preferred (McDonald 2000a: 436, 437; 2000b: 11). The persistence of traditional gender roles in the home conflicts with women's aspirations for employment, leisure time and a better life than that of their mothers and grandmothers. In these circumstances staying single, or childless, or having only one child, become more attractive options (Chesnais 1996: 730). Gender equity theory envisages that higher fertility rates are possible through support that enables women to combine motherhood and paid employment (McDonald 2000b: 12).

Hakim's (2000, 2001) “preference theory” argues that there is a greater degree of diversity in family preferences than gender equity theory reveals. Women's employment patterns do not necessarily reflect their preferences – for example, many in full-time employment would prefer to work part-time. Her research indicated that women have a range of different preferences in regard to the balance between paid work and “family work”. From survey research in Britain, Hakim concluded that the majority of women are neither home-centered (14 per cent) nor work-centered (16 per cent). Rather, the majority (70 per cent) are “adaptive”: they seek the best of

both worlds – to enjoy a combination of paid work and “family work”. This contradicted gender equity theory which, she argued, assumed an egalitarian model where two partners have equally demanding jobs and equally share childcare and housework. Hakim concluded that policy makers need to recognize the three preference groupings – rather than assuming symmetrical family roles – as in the egalitarian model. In particular she said that many mothers prefer to stay at home to take care of their young children and wish to have a major role in the family after the children go to school. The implication is that pronatalist policies should focus on the needs of adaptive and home-centered women who are more disposed to increase their family size if circumstances permit. Because improved child-care benefits work-centered women especially and only a minority of adaptive women, Hakim advocated tax concessions and a homecare allowance to pay mothers for their childcare work and to offset earnings foregone. Such schemes have been tried in Finland where the TFR in 2005 was 1.8 and in France where the TFR was 1.9. Hakim (2001: 5) noted that in France “the scheme and its popularity, have been the subject of continuous criticism from feminist academics who believe firmly that all women should work continuously and full-time throughout life, irrespective of their personal preferences.”

Nevertheless, a restoration of replacement-level fertility seems unlikely, because many career-oriented women voluntarily remain childless, others have no children, or only one, for reasons unrelated to employment and there has not been a general shift towards parents equally sharing family responsibilities. Replacement level fertility therefore depends on higher proportions of women having three or more children to balance the effects of childlessness but this also is unlikely (Demeny 2003: 760, 761). One possibility is that high income countries that achieve greater compatibility between parenthood and employment could stabilize fertility around 1.8, not dramatically below replacement and seek to use immigration to offset moderate deficits in the working ages (Demeny 2003: 761). Overall, none of the above theories of fertility identifies any potential for a large scale reversal of the low fertility regime affecting almost all developed countries. To achieve near-replacement level fertility, there needs to be either minimal childlessness and one child families, or an increase in the proportion of families with three or

more children. At the same time, having a large family is argued to be inconsistent with good parenting – which requires bestowing resources, time and attention on the children (Morgan 2003: 593). Also, although the United States fertility has proved an exception to wider trends, some explanations of the country’s relatively high fertility emphasize disadvantageous circumstances of poorer groups which, if ameliorated, would tend to produce lower rather than higher fertility (Frejka 2004). Nevertheless, other explanations emphasize positive features, including greater gender equity in the United States than in Europe, as well as American women’s greater economic resources (Kent and Haub 2005: 10).

Far-reaching changes in the family norms and values of developed societies became evident in the 1960s and 1970s. There is no predicting whether a future shift in values might bring equally significant changes in the family and fertility; such could well be required if age structure depletion is not to cumulate in many countries for decades to come. International migration is a partial remedy for labor shortages but this demographic response cannot compensate for long-standing imbalances in national age structures because of the huge numbers of migrants that would be needed to offset mounting deficits in the numbers of births (see Chapter 17).

Community, Family and the Individual

While national-level policy making aims to meet the greatest needs of the greatest numbers, it is at the community level that the consequences of aging are most manifest and constitute everyday concerns for individual residents and their families, together with service providers, planners and administrators. Moreover, change at the community level is often more rapid and more complex than at the national level, partly because of the high potential for “disordered cohort flow” (Waring 1975) and partly because, sub-nationally, migration is a major cause of population change and aging. Indeed, on a regional and local scale, migration can supplant fertility and mortality as the predominant process affecting the numbers and percentages of older people. For example, accelerated population aging occurs through inward migration of retirees to selected destinations, as well as through the outward migration of young people seeking

employment or further education. Aging is especially marked where both types of movement coincide, producing age structures with proportions in the older ages far above those observed nationally.

The community is also the main level at which national policies are implemented, such as through the provision of services and accommodation. It is important that policies seek to support communities in order to lessen adverse consequences of aging and bolster local resources for responding to it. In relation to community resources, there has been rising interest in social capital, which is “networks, together with shared norms, values and understandings which facilitate cooperation within or among groups” (OECD 2001). This OECD definition is currently influential in the design of data collections on social capital internationally (ABS 2002: 4). For individuals, social capital consists in “the resources that emerge from one’s social ties” (Astone 2003: 901).

The importance of social capital resides in its recognition of networks and relationships as a resource (Field 2003: 40). Social capital is an explanatory factor in migration itself, because social networks provide linkages between origins and destinations and the movement of individuals and families is facilitated through their membership of such networks (Massey 2003: 550). Similarly, participation in networks prevents social isolation, bringing the social and health benefits of social engagement, as well as better prospects for obtaining additional and compatible forms of assistance when needed.

In the social policy field, social capital is seen as having potential to reduce expenditure on social problems, encourage cooperation and trust and enhance quality of life. It assists in explaining why communities with similar resources may diverge in terms of social cohesion, initiative, mutual support and adaptability to change. Although causal links are difficult to confirm, social capital in the form of social and civic engagement and cooperation appears to bestow advantages of wellbeing and resilience on communities, as well as on individuals. Some go so far as to say that “social capital is the most fundamental resource a community requires in the creation of economic, social and political wellbeing” (Winter 2000: 9). As Field (2003: 121) stated:

... people’s ability to access resources through their social capital can make a considerable difference to their life chances. In so far as the state is expected to intervene in the distribution of resources more generally, in areas

such as health or education, social capital represents a tool of policy. In so far as social capital can itself be seen as a public good, it represents a goal of policy. Policies which promote social capital can therefore directly influence the well-being of the wider community.

Thus the community is not merely the context in which aged care policies are implemented, it is also a domain in which there is scope for initiatives that can enhance social resources, promote independent and co-dependent living and lessen the need for aged care.

As “the fundamental group unit of society”, the family is also an important component of people’s social capital; most people belong to a family network and participation in family life is a major source of life satisfaction. Policies that support family life – including public endorsement of the value of the family to society and recognition by employers of the significance of family roles and responsibilities – may support welfare generally, contributing to life-long benefits. Opposite tendencies, however – including never marrying, separation, divorce and childlessness – erode the potential of the family to maintain its vital supportive role in later life as well as in younger years.

It is at the level of the family that national policies on fertility and family welfare have their immediate impact, even though the objectives of such policies may include demographic goals, such as raising or lowering the birth rate and limiting increases in the numbers or percentages of older people. Understanding of family building behavior and decision making, through testing of theories of fertility, for example, is an essential concomitant of the development of policies for aging societies. Also, analysis of the family characteristics of cohorts, including living arrangements (United Nations 2001a) and the proportions never married, divorced or widowed, is a significant part of the development of cohort-based projections to inform policy making. Despite the rise of consensual unions, the family remains a nexus both in demographic inquiry, because it is the social institution where the immediate impacts of demographic processes are manifest, and in social policy because the immediate consequences of a range of policies are experienced at this level.

The final level at which social policies have an impact is the level of the individual. Just as policies enhancing social capital offer practical benefits for communities and families, so too enhancement of human capital benefits individuals. Both types of capital have the potential to contribute to improving wellbeing and pre-

venting or delaying aged dependency. Social capital and human capital are commonly thought to be complementary and mutually advantageous (Field 2003: 9). Whereas social capital arises from people's interrelationships with others, in families, groups and networks, human capital usually consists in individuals' characteristics that are of economic value such as skills, knowledge and good health (Field 2003: 9). For older people, economic value is one aspect of human capital – especially in relation to voluntary work and other productive activities – but important also is human capital conducive to independent living. For the aged generally, the latter includes education and health, both of which are associated with higher levels of social engagement and wellbeing. Thus the promotion of healthy lifestyles can be viewed as part of human capital development that benefits not only individuals but also families, communities and the society as a whole.

Conclusion

The 21st century will undoubtedly see aging at its height as a formative process in societies and as a stimulus for social policy innovation. The absence of convergence to a predictable end point, as well as the diversity in current demographic rates, indicates that population aging is far from being a uniform process among the world's populations. In developed countries, the second demographic transition has ushered in an era of much greater uncertainty about the future of population aging than seemed likely when the first demographic transition was the dominant model. Although the demographic transition offered no guidance in relation to changes in the characteristics of the aged – their life styles, life chances, health status and welfare needs – population aging would occasion less concern if the expectations about age structure change derived from it were fulfilled. Instead the second demographic transition, as well as other causes of high levels of population aging, have intervened, creating more varied and potentially more problematic national situations in which demographic adaptations are but one among a range of different types of needed responses. For instance, greater attention to the means of enhancing the resources of communities, families and individuals will be important in lessening the per-

sonal, social and economic costs of population aging in the future.

References

- Achenbaum AW (2005) Ageing and changing: International historical perspectives on ageing. In: Malcolm LJ (ed) *The Cambridge handbook of age and ageing*. Cambridge University Press, Cambridge, pp 21–28
- Andrews K (2001) National strategy for an ageing Australia: An older Australia, challenges and opportunities for all. The Hon Kevin Andrews MP, Minister for Ageing. Commonwealth of Australia, Canberra
- Astone NM (2003) Social capital. In: Demeny P, McNicoll G (eds) *Encyclopedia of population*, Macmillan Reference, New York, pp 901–903
- Australian Bureau of Statistics (ABS) (2002) *Social capital and social wellbeing: Discussion Paper*. Australian Bureau of Statistics, Canberra
- Blaikie A (1999) *Ageing and popular culture*. Cambridge University Press, Cambridge
- Bongaarts J, Feeney G (1998) On the quantum and tempo of fertility. *Popul Dev Rev* 24(2):271–291
- Chesnais J (1996) Fertility, family, and social policy in contemporary Western Europe. *Popul Dev Rev* 22(4):729–739
- Cicero MT (1998) 44BC In: Powell JGF (ed) *Cato maior de senectute*, New York: Cambridge University Press
- Coale A, Guo G (1990) New regional model life tables at high expectation of life. *Popul Index* 56:26–41
- Coale AJ, Demeny P (1983) *Regional model life tables and stable populations*, 2nd edn, Academic Press, New York
- Coleman D (2004) Why we don't have to believe without doubting in the "Second Demographic Transition" – some agnostic comments. *Vienna Yearbook of Popul Res*, pp 11–24
- Cowgill DO (1970) The demography of ageing. In: Hoffman AM (ed) *The daily needs and interests of older people*. Charles C. Thomas, Springfield, pp 27–69
- Demeny P (2003) Population policy. In: Paul D, Geoffrey M. (eds) *Encyclopedia of Population*, Macmillan Reference, New York USA, pp 752–763
- Easterlin RA (1996) Economic and social implications of demographic patterns. In: Robert HB, Linda KG (eds) *Handbook of aging and the social sciences*, 4th edn. Academic Press, San Diego, pp 84–93
- Field J (2003) *Social capital*, Routledge, New York
- Frejka T (2004) The curiously high fertility of the USA. *Popul Stud* 58(1):88–92
- Hakim C (2000) *Work-lifestyle choices in the 21st century: preference theory*. Oxford University Press, Oxford
- Hakim C (2001) Taking women seriously. *People and Place* 9(4):1–6
- Harper S (2006) *Ageing societies: Myths, challenges and opportunities*, Arnold, London
- Harris DK (1988) *Dictionary of gerontology*. Greenwood Press, New York
- Hauser PM (1976) Aging and world-wide population change. In: Robert HB, Ethel S (eds) *Handbook of aging and the social sciences*. Van Nostrand Reinhold, New York, pp 59–86

- Holzmann R (1988) Ageing and social security costs. *Eur J Popul* 3:411–437
- Howse K (2005) Policies for healthy ageing. *Ageing Horizons, Oxf Inst Ageing*, 2:3–15
- Kalache A, Barreto SM, Keller I (2005) Global ageing: The demographic revolution in all cultures and societies. In: Malcolm LJ (ed) *The Cambridge handbook of age and ageing*, Cambridge University Press, Cambridge, pp 30–46
- Kent MM, Haub C (2005) Global demographic divide. *Population Bulletin* 60(4), December. Washington: Population Reference Bureau
- Kinsella K, Phillips DR (2005) Global aging: The challenge of success. *Population Bulletin*, 6(1), Population Reference Bureau, Washington
- Kirk D (1996) The demographic transition. *Popul Stud* 50:361–387
- Laslett P (1989) *A fresh map of life: The emergence of the third age*. Weidenfeld and Nicolson, London
- Lesthaeghe R, Surkyn J (2004) When history moves on: The foundations and diffusion of a second demographic transition. Paper presented at the 12th Biennial Conference of the Australian Population Association, Canberra. (Also forthcoming in *Ideational Perspectives on International Family Change*, edited by Thornton A, Axinn W, Jayakody R)
- Lutz W, O'Neill B, Scherbov S (2004) Europe's population at a turning point. *Vienna Yearbook of Population Research*, 2004, pp 303–312. 306
- Massey DS (2003) International migration. In: Demeny P, McNicoll G (eds) *Encyclopedia of population*. Macmillan Reference, New York, pp 548–553
- McDonald P (2000a) Gender equity in theories of fertility transition. *Popul Dev Rev* 26(3):427–439
- McDonald P (2000b) Gender equity, social institutions and the future of fertility. *J Popul Res* 17(1):1–16
- Morgan PS (2003) Is low fertility a twenty-first century demographic crisis? *Demography* 40(4):589–603
- Myers GC (1995) Demography. In: George LM (ed) *The encyclopedia of aging*, 2nd edn. Springer Publishing Company, New York, pp 260–264
- Myers, GC, Eggers M (1996) Demography. In: James EB (ed) *Encyclopedia of gerontology: age, aging and the aged*, Academic Press, San Diego
- National Institute on Aging (1998) *Aging in the Americas into the XXI century* (wall chart). National Institute on Aging, PAHO/WHO and U.S Bureau of Census, (place of publication not specified)
- National Research Council (2001) *Preparing for an aging world: The case for cross-national research*, National Academy Press, Washington DC
- Notestein F (1954) Some demographic aspects of aging. *Proc Am Philos Soc* 98 38–46
- OECD (1996) *Ageing in OECD countries: A critical policy challenge*. OECD, Paris
- OECD (2001) *The wellbeing of nations: The role of human and social capital, education and skills*. OECD Centre for Educational Research and Innovation, Paris
- Oeppen J, Vaupel JW (2002) Broken limits to life expectancy. *Science* 296(5570):1029–1031
- Pillemer K, Moen P, Wethington E, Glasgow N (2000) *Social integration in the second half of life*. Johns Hopkins University Press, Baltimore
- Rosow I (1967) *Social integration of the aged*. Free Press, New York
- Rowe JW, Kahn RL (1998) *Successful aging*. Random House, New York
- Rowland DT (2003) An ageing population: Emergence of a new stage of life? In: Khoo S-E, McDonald P (eds) *The transformation of Australia's population: 1970–2030*, University of New South Wales Press, Sydney, pp 238–265
- Rowland DT (1994) Population policies and ageing in Asia: A cohort perspective. In *the ageing of Asian populations*, United Nations Department of Economic and Social Information and Policy Analysis, New York, pp 15–32
- Rowland DT (2003) *Demographic methods and concepts*. Oxford University Press, Oxford
- Rowland DT, Temple J, Jackson N, Rees P (forthcoming) Migration and ageing. In: Bell M, Hugo G, McDonald P (eds) *Australian mobility in the new millennium*. University of New South Wales Press; Sydney
- Siegel JS (1990) Review of "A fresh map of life: The emergence of the third age". *Popul Dev Rev* 16(2):363–367
- Tien HY et al (1992) China's demographic dilemmas. *Popul Bull* 47(1) (June)
- U3A Australia (2007) About U3A. <http://www.u3a.org.au/aboutU3A.html> (accessed 2 February 2007)
- Uhlenberg P (2005) Demography of aging. In: Dudley LP, Michael M (eds) *Handbook of population*, Kluwer Academic/Plenum Publishers, New York, pp 143–167
- United Nations (1973) *The determinants and consequences of population trends*, vol 1. United Nations Department of Economic and Social Affairs, Population Studies No. 50, ST/SOA/SER. A/50, New York
- United Nations (1988) *Economic and social implications of population aging*. United Nations Department of International Economic and Social Affairs, (ST/ESA/SER.R/85), New York
- United Nations (2001a) *Living arrangements of older persons*. Population Bulletin of the United Nations, No.42/43, (ST/ESA/SER.N/)
- United Nations (2001b) *World Population Prospects: The 2000 Revision*, CD, Disk 1: Standard Set. United Nations, Department of Economic and Social Affairs, Population Division, New York
- United Nations (2002a) *World population ageing 1950–2050*. United Nations Department of Economic and Social Affairs, Population Division. ST/ESA/SER.A/207, New York
- United Nations (2002b) *Report of the Second World Assembly on Ageing*, Madrid, 8–12 April 2002. United Nations. (A/CONF.197/9), New York
- van de Kaa DJ (1987) Europe's second demographic transition. *Popul Bull* 42(1)
- Waring JM (1975) Social replenishment and social change: The problem of disordered cohort flow. *Am Behav Sci* 19:237–256
- Winter I (ed) (2000) *Social capital and public policy in Australia*. Australian Institute of Family Studies, Melbourne
- World Bank (1994) *World population projections*. Johns Hopkins University Press, Baltimore

Part II
Aging Populations

Chapter 4

Population Ageing in Italy and Southern Europe

Cecilia Tomassini and Giovanni Lamura

Introduction

International research on population ageing up to the 1970s focused mainly on selected countries in Western and Northern Europe. One of the main reasons behind the limited interest in Southern Europe was the low number and proportion of aged people in the area. In 1951 the proportion of people aged 65 and over was around 12 per cent in the UK and 10 per cent in Sweden compared with only 8 per cent in Italy, Portugal and Spain and 7 per cent in Greece. However, the demographic trends behind population ageing have been so rapid and so remarkable in Southern Europe that nowadays, this region together with Japan is among the “oldest” areas of the world. The rapid and intense decline in fertility jointly with impressive achievements in extending survival, especially at older ages, have contributed to making Italy and Spain (and to a lesser extent Greece and Portugal) the countries with the highest proportion of older people, highest median age of population and highest ageing index. The challenges of this rapid population ageing are therefore unique in Southern Europe and they require a detailed analysis of the demographic and socio-economic structures, together with the understanding of the cultural context of the countries belonging to this area.

C. Tomassini (✉)
Department of SEGES Faculty of Economics
2 Ed. Polifunzionale
University of Molise
Via F. De Sanctis
86100 Campobasso, Italy
E-mail: cecilia.tomassini@unimol.it

A Demographic Overview

The older population is currently growing much faster than the population as a whole in almost all developed countries. In Italy the growth rate for the total population was 7 per cent between the 1951 and 1961 censuses, while the growth rate for people aged 65 and over was 24 per cent (ISTAT 2006a; Eurostat 2006). Between the 1991 and 2001 censuses the growth rate for the Italian population as a whole was less than 0.4 per cent while the growth rate for the older population was still more than 20 per cent. Similar changes are found in Spain and other Southern European countries (Eurostat 2006). An increase in the number of older people affects significantly the age structure of populations when fertility is very low. For this reason, in Southern Europe the proportion of people aged 65 and over has increased since 1950 much faster than in other European countries where population ageing started earlier. As shown in Table 4.1, the proportion of the population over age 65 more than doubled between 1950 and 2005 in Italy and Spain and almost tripled in Greece and Portugal. Conversely, countries such as France, Sweden and the UK, which already showed high proportions of older people in 1950, had a more modest increase during the last few decades.

The Role of Fertility in Population Ageing in Southern Europe

Population ageing in Southern Europe is in the first place the result of the sustained fertility decline that occurred

In this chapter we define Southern Europe as comprising Italy, Spain, Greece and Portugal.

Table 4.1 Proportion of people aged 65 and over. Selected European countries

	1950	1960	1970	1980	1990	2000	2005
Greece	6.8	9.4	11.1	13.1	13.7	16.5	17.8 ^a
Spain	7.3	8.2	9.5	10.8	13.4	16.7	16.8
France	11.4	11.6	12.8	14.0	13.9	16.0	16.4
Italy	8.3	9.3	10.8	13.1	14.7	18.1	19.5
Portugal	6.7	7.8	9.2	11.2	13.2	16.0	17.0
Sweden	10.1	11.7	13.6	16.2	17.8	17.3	17.2
United Kingdom	10.9	11.7	13.0	14.9	15.7	15.8	16.0

^a The data for Greece refer to 2004.

Source: Eurostat New Cronos (2006).

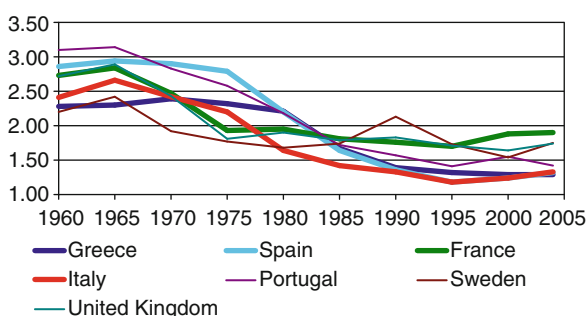
during the third quarter of the twentieth century. Falling fertility leads to relatively fewer young people in the population and hence a rise in the proportion of older people. The share of the population aged 0–14 decreased from 26 per cent in 1951 to 14 per cent in 2005 in Italy and from 29 to 16 per cent in Portugal (Eurostat 2006; ISTAT 2006a).

Fertility decline in Southern Europe occurred with completely different timing and intensity than in the rest of the continent. Interestingly, this difference notwithstanding, the timing of the process was quite similar for the four main countries of the area, even if the starting levels of both cohort and period fertility were quite different. Figure 4.1 and Table 4.2 show the trends in period and cohort fertility indicators for the four Southern European countries compared with Sweden, France and the United Kingdom. The period total fertility rate in the 1960s was approximately 3 children per woman in Spain and Portugal and around 2.3 in Italy and Greece. Conversely, period fertility rates in some Northern European countries were lower: for example

Sweden's TFR was 2.2 children per woman. In 2004, while the Swedish TFR slightly declined to 1.8 children per woman, in the four main countries in Southern Europe it declined to 1.3 children per woman, among the lowest levels recorded in Western countries. In fact during the 1990s both Italy and Spain reached levels of fertility that were among the lowest ever recorded, with less than 1.2 children per woman.

Looking at the reproductive behaviour of different cohorts of women (Table 4.2) similar patterns may be found. Portuguese women born in 1930 had a completed fertility of almost 3 children, well above the 2.6 for French women, but women born thirty-five years later bore on average 1.8 and 2.0 children in Portugal and France, respectively. During this interval Spain, Portugal and Italy had a decline in cohort fertility of almost one child, whereas in Sweden the decline was much more limited. Interestingly, in Southern Europe such low levels of fertility were not combined with high levels of childlessness; instead these were found in countries with higher fertility levels, for example in England and Wales. In fact the proportion of childless women in Italy declined for the cohorts born between 1930 and 1955 from 13.7 to 11.1 per cent (Santini 1995; Eurostat 2006), while it increased in England and Wales from 13.0 to 17.3 per cent. Portugal, despite a slight increase in the percentage of childless women for the same cohorts (from 4.5 to 7.5), has always displayed a proportion of women without children that is among the lowest in Western Europe.

As a consequence, another common characteristic of Southern European countries is the high proportion of women with low parity. More than two thirds of women born in 1955 had one or two children



Source: Eurostat (2006), Santini (1995)

Fig. 4.1 Total fertility rates in selected European countries

Table 4.2 Completed fertility by cohort in selected European countries

	1930	1935	1940	1945	1950	1955	1960	1965
Greece	2.21	2.02	2.01	2.00	2.07	2.03	1.93	1.75
Spain	2.59	2.67	2.59	2.43	2.19	1.90	1.76	1.59
France	2.64	2.58	2.41	2.22	2.11	2.13	2.11	2.02
Italy	2.29	2.29	2.14	2.06	1.90	1.79	1.66	1.49
Portugal	2.95	2.85	2.61	2.31	2.12	1.97	1.89	1.82
Sweden	2.11	2.14	2.05	1.96	2.00	2.03	2.04	1.99
United Kingdom	2.35	2.41	2.36	2.17	2.03	2.01	1.97	1.89

Source: Eurostat New Cronos, Santini 1995.

compared with just over 50 per cent of women born in the same year in England and Wales. Conversely, the proportion of women with more than 2 children has declined substantially in Southern Europe: for example in Spain 61 per cent of women born in 1940 had 3 children or more compared to only 23 per cent of women born in 1955. In Italy and Portugal the proportion of women born in 1955 who had 3 or more children is around 22 per cent. On the other hand the proportion of women with high parity has decreased only slightly in the selected Northern European countries, with indeed an increase for cohorts born after 1950. These considerations are extremely important when considering future kin availability for older people in Southern Europe, considered in the second section of this chapter.

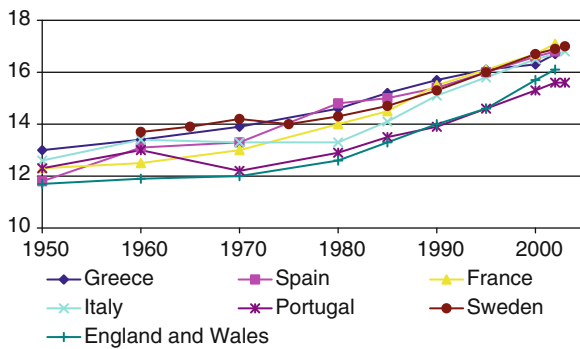
Demographers emphasise the similarity of trends in fertility in the Southern European countries, even if the four countries have quite different socio-economic characteristics. Among the causes that have been suggested is a common pattern of delay in marriage and childbirth, as a result of longer periods of education and a later stable working career (Billari et al. 2002). The delay in union formation and childbearing is confirmed by trends in age at marriage and age at birth of the first child in Southern Europe. Mean age at first marriage for women was 24.8 in Italy and 26 in Spain in 1960; in 2004 the values were 29.2 and 30.2 respectively (ISTAT 2006a; INE 2006). Similarly, mean age at birth of the first child is close to 30 both in Italy and Spain. One of the most important consequences of delay in union formation and childbearing is a compression of the reproductive period, with subsequent reduction in the proportion of high parity women as discussed above. This feature has not occurred however in Portugal, where low fertility is

associated with a younger pattern of fertility, with mean age at birth of the first child equal to 26.2 in 2003.

A delay in fertility may have important consequences for the support of older people. Mothers typically reach their eighties (when they need more support) when their children are still in their fifties; these children may well be in good health but, increasingly for women as well as men, may still be active in the labour market (see Section “Health, Social and Informal Care Arrangements for Older People in Italy” below). Increasing mean age at fertility has important consequences also on the proportion of children having a mother still alive at certain ages. A study on future trends of kin availability in Italy showed, using microsimulation, how rising age at childbirth is substantial enough to outweigh the effect of the mother’s improved chances of survival to old age (Tomassini and Wolf 2000). For example, for a woman aged 55–64 the probability of having the mother alive was 23.2 in 1994, will increase to 45.5 in 2040 but will decline slightly to 42.4 by 2050. This shows that after the significant increase in the proportion of women with the mother alive due to survival improvements, there is a subsequent decline due to delay in age at childbearing.

The Role of Mortality in Population Ageing

Declines in mortality have also played an important role in population ageing, especially in explaining the ageing of the old population itself. Life expectancy in Italy at age 65 was 12.6 years for men and 13.7 years for women in 1950 but increased to 16.8 and 20.6 years in 2003 (Eurostat 2006; ISTAT 2006a).

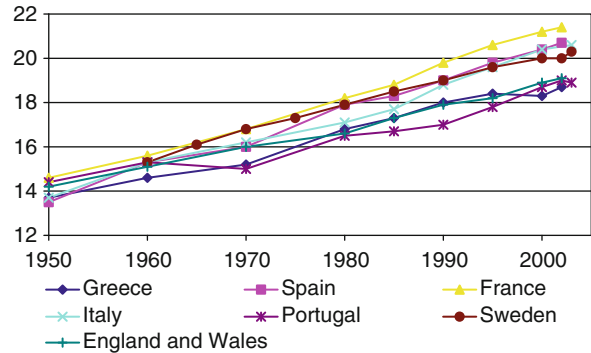


Source: Eurostat (2006), ISTAT (2006b)

Fig. 4.2 Life expectancy at age 65 (males) in selected European countries

Similar increases have been found in the other Southern European countries as shown in Figs. 4.2 and 4.3. For people in this region, life expectancy at birth was low compared to their northern counterparts: for example in Spain in 1950 a male newborn on average lived 60 years and in Portugal 56 years, compared with 66 years for a male newborn in England and Wales. Interestingly however, life expectancy at age 65 in 1950 was broadly the same for Northern and Southern Europe, especially for men: for example a Spanish 65-year old man in 1950 could be expected to live as many years as his English peer, around 12-years. Greece showed the highest male life expectancy at age 65 up to the 1990s.

Life tables relating to 2003 for Italy show that about 1 woman in 2 and 1 man in 3 reached age 85 and 1 woman in 10 reached age 95 (ISTAT 2006a). Future life tables may show even better performances, given that 2003 (the latest available year for statistics on life expectancy for the countries considered) was a year marked by higher than expected mortality, especially at older ages (ISTAT 2006b). This was due to a particularly hard winter combined with a notorious heat wave in the summer, giving rise to an increase in the number of deaths among older people in Italy as well as in other countries (Crumley 2003). The excess deaths during the heat wave stimulated an important debate in Europe and the U.S. on the importance of family support for older people. Areas with a higher proportion of older people living alone (especially in urban areas) and of residential care facilities, recorded a higher number of deaths related to the heat wave, confirming the importance of living arrangements and family support of older people



Source: Eurostat (2006), ISTAT (2006b)

Fig. 4.3 Life expectancy at age 65 (females) in selected European countries

for their wellbeing. We return to these topics in the next section.

The decline in mortality rates at older ages is a particularly significant factor in the increase in the proportion of oldest old among the older population. In Italy among the population aged 65 and over in 1960, those aged 65–74 represented 66.2 per cent and those aged 85 and over just 5.6 per cent, while in 2005 the two age groups represented respectively 53.7 per cent and 10.2 per cent of the older population. Projections for 2031 indicate the proportions will be respectively 48.3 per cent and 17.8 per cent (ISTAT 2006a).

Sex Ratio in Old Age and Regional Variation

Another interesting aspect of population ageing in Southern Europe is the sex ratio among older people. Although more males than females are born, mortality rates are higher for men than for women throughout the life course, resulting in a greater number of women at older ages and a much greater number at very old ages. This has important consequences for family life at older ages, as described in the next section. As noted earlier, Greece has one of the smallest sex differences in life expectancy at age 65 (Gjonca et al. 2005), given the exceptional survival performances of Greek men. The resulting Greek sex ratio after age 65 in 2005 was around 80 men per 100 women compared, for instance, to 70 men in France. For the same year at age 85 and over the sex ratio in Greece was around 74

men, compared with 47 men in Portugal and only 41 men in Italy. Very low sex ratios at older ages found in Southern Europe result from greater differentials in mortality between sexes during the periods in which the different generations of older people lived (Gjonca et al. 2005). In 2003, Italy and Spain (but also France) showed a gap between men and women in life expectancy at age 65 of about 4 years, while it was around 3 years in Sweden and England and Wales. Different patterns in the diffusion of risky behaviours such as smoking among women may partially explain these phenomena (Pampel 2003).

Another important feature of population ageing in Southern Europe is the uneven distribution in the national territory in the proportion of older people. Asturias, Galicias and the northeast in Spain have high proportions of older people, as does the Central Greece region (Eurostat 2006). Italy has remarkable variations between certain areas in the centre-north of the country and in some mountainous communities and urban areas in the south. There are two main reasons for these regional differences. First, certain areas have registered the lowest fertility ever recorded among developed countries: for example in Italy it is not uncommon to find a total fertility rate below 0.9 in some major municipalities such as Bologna or Genoa (Golini 2003). Very low fertility has distorted the age structure of the population, with an unprecedented increase in the proportion of older people: in both Bologna and Genoa the per cent of those aged 65 and over reached 22 in 2005 (ISTAT 2006a). Secondly, small mountain communities have experienced a considerable out-migration of young people looking for jobs in nearby urban areas, thus leaving behind markedly aged populations. Great concerns have therefore been raised about the support of those older people left behind without any primary family network to help them if they need care.

The force of fertility, mortality and to a lesser extent of migration, is contributing to the decline in the number and proportion of the young population as well as to the increase in the number and proportion of older people in Southern Europe. The resulting population ageing has significant social and financial implications for families and governments in terms of support for the older population, and the balance between care provided directly by the families and that obtained from the state or private market sources.

Main Socio-Demographic Characteristics of the Older Population

Southern European countries share several important socio-demographic characteristics that, together with the cultural context, provide a distinctive family environment. It is crucial to understand these before suggesting possible future trends in family support. Many indicators of family exchanges (e.g., living arrangements, geographic proximity, frequency of contact with family members, care exchanges) show consistent differences between Northern and Southern Europe, with the latter presenting stronger family ties and higher levels of family exchanges. At the same time, it is important to note that reciprocity is a key feature of such relationships and support flows are often taking place also from older to younger people, at least until quite advanced ages. The notion of the familistic culture has been used to describe Southern Europe (Banfield 1958; Reher 1998). In a familistic society, personal utility and family utility are the same: the structure of the family and the relationships among the family members are a consequence of the strong ties that link them together. It has been demonstrated that, historically, Italian family networks tended to be less dispersed than elsewhere (Höllinger and Haller 1990; Tomassini et al. 2003). This high level of propinquity has been ascribed to cultural factors such as the agricultural and artisan traditions that encouraged successive generations (and especially fathers and sons) to live near each other (Barbagli 1997), or to religious factors (Pampel 1992). The effects of the “familistic culture” on attitudes will be discussed further at the end of this section.

Marital Status and Children Availability

As the majority of care required by older people with support needs is provided by close relatives, particularly spouses and children, these members of the family network are important sources of social support and contact for all older people (Sundström 1994). Changes in the availability of these close relatives, which depend very largely on the marital and childbearing patterns of successive cohorts entering old age, is thus a key parameter for policy makers concerned with future needs for formal support.

Exceptional improvements in longevity especially at older ages, combined with decreasing levels of celibacy and a later introduction of divorce in Southern Europe, have led to an increasing proportion of older people, especially women, living in couples. Between the 1970 and 2000 censuses Italy showed a remarkable increase in the proportion of women aged 65 and over who were married, from 28 to 40 per cent (around 12 points higher), while Portugal and Spain showed an increase of around 8 per cent (Stuchbury et al. 2006). Conversely, France, Denmark and the Netherlands in the same period experienced no change in the proportion of older women still married after age 65. According to projections of marital status, taking into consideration trends in mortality, the number of married older people will increase consistently in the next fifty years (Kalogirou and Murphy 2006). In Italy among women aged 75 and over, the proportion of those married is projected to rise from 23 per cent in 2000 to more than 40 per cent in 2030. These trends imply that an increasing number of people will spend their old age with their partner and therefore be more likely to have a potential carer in case of need.

Southern Europe is also characterised by a low proportion of divorced older people when compared to Northern European countries. Divorce was introduced in Italy in 1970 and the law was finally approved with a referendum in 1974; in Portugal a modern divorce law was approved in 1975, in Spain in 1981 and in Greece, in different phases, between 1979 and 1983. Late introduction of divorce in the area and very low economic activity rates among older women (traditionally associated with low propensity to divorce), has kept the proportion of divorced people at older ages negligible until recently. In 2005 in Italy among men and women aged 65 and over only 1 per cent was divorced (not including separated people) (ISTAT 2006a). The situation will rapidly change as cohorts who experienced higher divorce rates at younger ages reach later life. However, even if the number of divorced older people increases in the future, the proportion will remain low in Southern Europe and it is very unlikely that it will offset the rise in the proportion of older people with a partner (Kalogirou and Murphy 2006).

Another crucial point in family support is the existence of children. Changes in the availability of kin have often been cited as an important influence on living arrangements and other indicators of family

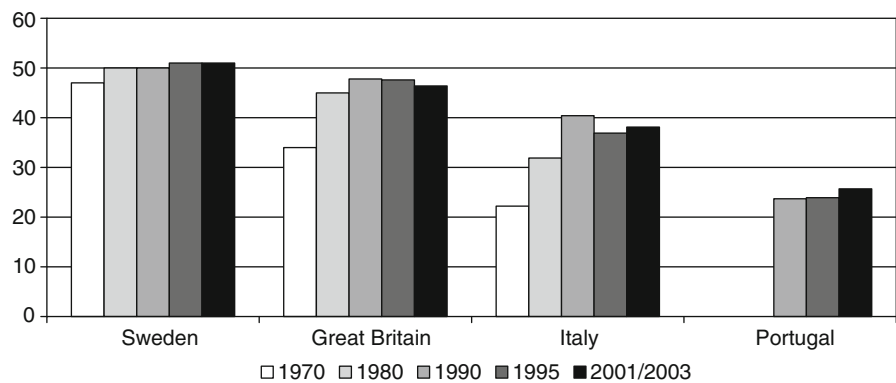
support for older people (Kobrin 1976; Weinick 1995). Past trends in fertility quantum and timing, together with changes in mortality, play the main role in the availability of children for older people. As seen in the previous section, Southern Europe had a different parity distribution than the North, with low levels of childlessness and a decreasing proportion of high order births. In 2003 in Italy more than half of those aged 65 and over had 1 or 2 living children and less than 5 per cent had more than 4; only 14 per cent were childless. In Greece, around 10 per cent of those aged 65 and over had no children in 2004 and in Spain around 12 per cent (SHARE 2005). However, these fertility characteristics (low childlessness and concentration at low parities) coexist with a high level of closeness between parents and children in Southern Europe, which is discussed below.

Living Arrangements

Despite the traditional association between concentration of fertility in low order births and lower levels of intergenerational exchanges (Wolf 1994), low parity does not seem to be related to reduced coresidence between parents and children in Southern Europe (Tomassini and Grundy 2006). Results from national surveys show that in the 1950s and early 1960s between a third and a half of older people in several countries in Northern Europe and the USA lived in households including at least one of their children. By contrast, data for these countries from the early 1990s show high levels of residential independence and low proportions of older people living with children (Grundy 1996; Sundström 1994; Sundström et al. 1989). Trends in other industrialised countries show similar substantial declines, although the extent of coresidence is somewhat higher in Southern Europe and Japan (Pampel 1992; Reher 1998). In Spain, for example, the proportion of older people living with their children fell by more than half between 1970 and the mid 1990s (from 58 to 23 per cent) but was still high in comparison with Sweden where only 2 per cent of older people were living with children in the mid 1990s (Sundström and Tortosa 1999).

Figure 4.4 shows trends in living alone among women aged 65 and over in Italy and Portugal compared with Sweden and Great Britain between 1971

Fig. 4.4 Proportion of women aged 65 and over living alone by country and year



Source: Tomassini et al. (2004)

and the latest available year. In the 1970s and the 1980s there was a remarkable increase in the proportion of women who were living alone in Italy, whereas during the 1990s there was little change. The deceleration of the increase in solitary living was mainly due to the rising proportion of older women living in a couple, as observed earlier. Additionally, in Southern European countries, coresidence between parents and children is often prolonged for many years, until children leave the parental home in order to get married and obtain a permanent job (Dalla Zuanna 2001). Data for Portugal show a proportion of older people living alone still slightly increasing, but the level in solitary living among older women is quite low compared to Northern Europe and Italy.

It is important to stress again that low parity seems to have a limited effect on coresidence between parents and children in Southern Europe. In Italy, the crucial factor for coresidence appears to be having at least one surviving child (Tomassini and Wolf 2000). Moreover, fewer children may result in greater postponement of residential independence among young adults, through both a reduced influence of the “crowding” effect on decisions to leave the parental home and greater access to parental resources. Another study (Tomassini and Grundy 2006) showed that Italian mothers of only children are older when their first child leaves home than higher parity mothers. Two factors could account for this. First, only children may more often be late-born children and, second, only children may be older when they leave home. In countries like Italy, where the proportion of women with just one child is increasing, this implies that extended coresidence could partly offset the reduced number of children,

although it is important to remember that older parents may provide support to their children, rather than vice versa, and that the onset of health impairments that challenge solitary independent living is unusual before the age of 80.

Proximity to Children

Studies have shown that norms of mutual responsibility between parents and children can often be met through proximity, and do not necessarily require coresidence (Mancini and Bleiszner 1989). Thus, it has become increasingly important to analyse the spatial proximity of older people and their kin, in addition to intergenerational coresidence, in order to provide a more comprehensive view of the availability of family support to older people. In Italy, data from a national survey conducted in 2003 showed that when considering a parent’s closest child, 34 per cent were living with him/her, 14 per cent were living in the same block and 22 per cent within one kilometre. Thus 70 per cent of older parents had at least one child within a distance of one kilometre (ISTAT 2006c). A recent study in Italy found that parental assistance in purchasing the child’s housing played an important role in later proximity between parents and children, and the effect was reduced in larger families (Tomassini et al. 2003). Parental support for a child’s home purchase may influence the child’s choice of location, which may also be chosen to facilitate parent-child contacts, grandchild care, or parent care (Pezzini and Schone 1999). When proximity to grandchildren is

considered, 62 per cent of Italian grandparents were living within one kilometre of their closest grandchild in 2003. Among those older people with children, grandchildren or siblings, only 1 per cent was living more than 16 kilometres from the closest of them (ISTAT 2006c).

It is important to note, though, that high levels of proximity to children are not necessarily linked to the needs of parents but, especially in the case of young older, they may be an indicator of the support that parents provide to their children. In a study that compared the determinants of coresidence and parent-child proximity in Italy and Great Britain, it was found that the probability of living with or in close proximity to a child was similar in Britain and in Italy among women in the least favoured socio-economic group (aged 70–74, widowed, medium/low education, two children, tenants). In Italy, however, women in the most advantaged group (aged 60–64, married, high education, two children, homeowner) had higher probabilities of coresidence with children than in Britain (Glaser and Tomassini 2000). This result suggested that parent-child proximity in Britain may be more likely to arise from the needs of the older generation, whereas in Italy parent-child proximity may reflect a cultural preference, regardless of need. Reasons for coresidence and residential proximity therefore are complex and are significantly affected by cultural preferences.

Contacts

Frequency of contact with family members is an indicator of the strength of intergenerational exchange and potential support for older people. Frequent family contact as well as coresidence seems to be more usual in Southern than in Northern Europe (Farkas and Hogan 1995; Höllinger and Haller 1990; Lowenstein et al. 2003). A 1992 Eurobarometer survey, for example, reported that 70 per cent of people aged 60 and over in Italy had daily contacts with relatives and friends, compared with 19 per cent of their Dutch counterparts (Walker 1993). More recently, Lowenstein and colleagues (2003) involved in the EU-funded project OASIS collected comparable data on intergenerational family solidarity in four European countries and in Israel, showing that 90 per cent of older Spaniards had weekly contacts with their children, compared with

only 56 per cent of their German counterparts. In Italy in 2003, 94 per cent of parents aged 65 and over see their children at least once a week (including parents that are living with children) (ISTAT 2006c). Unlike other countries, contact with children in Italy does not seem to be higher for mothers than fathers (Tomassini et al. 2004). It has been hypothesised that, within a familial culture, exchanges between family members flow regardless of the individual characteristics (like gender) of the giver and receiver (Tomassini et al. 2003).

Some studies explain differences in frequency of contacts and more general intergenerational exchanges through demographic and socio-economic individual characteristics (e.g., education, marital status, number of children), that may enable or hamper older people to have wider support networks (Daatland and Herlofson 2003). Concerns arise that as these characteristics change, the levels of contact and other indicators of family exchange may decline in Southern Europe. The increase of divorce and improvements in educational level among older people, currently not high in Southern Europe, may also be seen as a potential future challenge to family solidarity; several studies in Northern Europe and the U.S. have shown that parental divorce is associated with lower levels of contact, particularly between fathers and children (Dykstra 1997). A recent comparison of several European countries found that paternal divorce was associated with a reduced probability of frequent contact between fathers and children (less noticeable for mothers). However, possible future scenarios of contact with children that combine the observed effects of the explanatory variables with hypothetical changes in population distribution (as for example large increases in the proportion of divorced population or in the proportion of parents with only one child), suggest that concerns about declining family networks among older people in Europe may be overstated, given the observed high level of frequent contact between parents and adult children and the small effects of the explanatory variables such as increases in divorce and education level and decreases in fertility (Tomassini et al. 2004).

Attitudes

Strong family ties in Southern European countries appear to be related to cultural attitudes on

appropriate support for frail older people. Results from Eurobarometer surveys, for example, showed that in all European countries feelings of intergenerational solidarity are still strong. Two-thirds of people interviewed in the European Union (25 countries) in 2002 thought that their generation had a responsibility towards the older people. But this general proportion was the result of two very different attitudes: between 80 and 90 per cent of Greek and Italian respondents think it a good thing for working adults to look after their older parents, compared with just 30–40 per cent in Sweden, Netherlands and Finland (Alber and Kohler 2004). Despite the common feeling of responsibility towards older people, the younger generations from Northern and Southern Europe had different ideas about providing help to frail parents when in need. For example, the 2002 Eurobarometer found that 81 per cent of the Spaniards and 59 per cent of the Italians would help their frail parents by living with them, compared with 40 per cent of the British and 10 per cent of the Danish people (Alber and Kohler 2004). On the other hand, Northern Europeans more frequently considered the option of a residential or nursing home (43 per cent of the Swedes against just 2 per cent of the Italians and 1 per cent of the Greeks). The 2002 Eurobarometer survey showed also that attitudes towards older parents change very little by age and working status in Italy (Alber and Kohler 2004). Whether the attitudes towards elder care are driven by the scarcity of adequate formal care services or by shared values, as religious beliefs, is still controversial, even if the two paths are not mutually exclusive. The attitudes towards family support found in Southern European countries are shared among the new members of the European Union in Eastern Europe and Turkey (Alber and Kohler 2004), reinforcing the hypothesis that certain religious beliefs (e.g., Catholicism) may be a necessary but not a sufficient prerequisite for preferences to family support. Currently families provide much of the care needed and, despite large falls in coresidence, levels of intergenerational care and support are high in Southern Europe. This is described in the following section, where the Italian case is taken as an example and examined in detail because, despite some peculiarities (in particular the high relevance of monetary transfers), it reflects most structural aspects of the Mediterranean care regimes.

Health, Social and Informal Care Arrangements for Older People in Italy

Overall Health Trends

The health of older Italians has been improving in the last few decades, so that besides a continuing increase in life expectancy, they are also enjoying an increase in the proportion of life that is free from illnesses or impairments causing disability (also known as *disability free life expectancy*: DFLE). The most recent comparable data available from the European Community Household Panel (ECHP) show that, in the 1995–2001 period, the DFLE in Italy increased both for men (from 66.7 to 69.8 years) and women (from 70 to 73 years) (Robine et al. 2005: 13). This trend seems to be confirmed by ISTAT data (2005: 66), which report for the 1994–2000 period an increase of one year in DFLE at the age of 65 for both men (from 12.7 to 13.7 years) and women (from 14.2 to 15.2 years).

However, quite apart from the methodological uncertainties regarding disability and health statistics over time (not to mention cross-national comparability), it should be noted that, in connection with the overall increase in the aged Italian population, this DFLE improvement is only partly matched by a corresponding decrease in the overall disability rates of older Italians, since in the same period 1994–2000 the proportion affected by at least one disability dropped for older men (from 15.4 to 14.3 per cent) but increased for older women (from 22.4 to 22.9 per cent) (ISTAT 2005: 52).

Health and Social Care

The latter data show that, despite the improved health status of older Italians, the overall demand for elder care has not been decreasing in the country, thus creating pressure for a shift in the current system of providing both acute and long-term care. In order to understand the type of difficulties this might produce, it is appropriate briefly to describe the Italian welfare system.

Since the late 1970s, the Italian welfare regime has organised care (including elder care) by distinguishing health from social care. This has sometimes resulted

in difficulties with access and usage of elder care services by the older population, not only because of the imperfect financial and organisational integration of the relevant authorities (the regions for health, the municipalities for social care) but also because of the traditional preference of the Italian welfare system for providing monetary payments (i.e., allowances), rather than direct services. In these circumstances, care recipients enjoy not only the freedom but also the burden of deciding how to use the allowances received. This arrangement has indirectly promoted the development of a wide private care market, mainly on an undeclared basis, in the form of foreign migrants employed as live-in home care workers directly by the families of older people. This solution, which can without exaggeration now be considered as standard in Italy for the provision of long-term care to an older person affected by a disability or chronic illness, has been facilitated also by a series of other factors (which are described below).

Health Care

As a preliminary, it should be underlined that health care – in Italy mainly funded by taxes and provided by the regions through local health authorities – is provided free of charge in following cases: when it is provided within primary care settings (i.e., by General Practitioners and Paediatricians as first point of consultation for the general population); in case of hospitalisation (i.e., following admission through the casualty ward or prescribed by the GP); if one suffers from particularly severe pathologies (e.g., cancer patients do not have to pay for their treatment nor medicines); for low income groups (i.e., any individual earning less than circa 36,000 euros per year is exempted from co-payments). The provision of social care – also tax-funded but provided by municipalities on a means-tested basis – varies greatly across the country, both in qualitative and quantitative terms, depending on the traditions and financial resources of individual municipalities.

Health care is mainly provided at three points: the General Practitioner (GP), the health district and the hospital. The GP is the professional institutionally responsible for supplying free, continuous primary care (except on weekends, when Emergency Care Units are on duty) for to up to 1,500 patients per GP and often

represents therefore the natural repository of the health problems of older patients. Specialised treatment and laboratory services are usually supplied by the health districts and, in case of acute problems, by the hospital, where out-patient services are also often available. In addition, health districts are usually responsible for coordinating the provision of Integrated Home Care Services (*Assistenza Domiciliare Integrata: ADI*), which are provided to severely ill patients at their own home and include health, nursing, rehabilitation and social care. Home health care services (i.e., excluding social care) are quite widespread, currently reaching about 4.9 per cent of the households in which older people live (ISTAT 2006c). However, a problem is often reported in the lack of coordination between different health and social care institutions (Abate et al. 1995: 32–33). For this reason, many Italians prefer to buy care (often on an undeclared basis) from the private market. This was certainly one of the reasons behind a rationalisation of the hospital care system that occurred during the 1990s (Vineis and Paci 1995). Another reason was to improve the provision of appropriate care to the increasing number of older patients with chronic illnesses (Carbonin et al. 1997) – when the Diagnosis Related Groups (DRG) system of payment was introduced, it succeeded in reducing the average length of hospital stay from almost 12 to less than 7 days between 1990 and 2000 (Lamura et al. 2006). Residential care funded by the health system (provided in nursing homes, rehabilitation or post-acute facilities) may currently be estimated to provide nationally about 120,000–125,000 beds for dependent older people (Mesini and Gambino 2006: 59), thus corresponding to a little under 1.0 per cent of the older population.

Monetary Transfers

One of the most relevant means of providing support to dependent (not necessarily older) persons in Italy is by monetary transfers to meet care related expenses. Dependent persons in Italy are entitled to different kinds of state care allowances, according to the severity and type of disability and partly also to the person's income level (Principi 2005). These can vary from a minimum of about 2000 euros/year in case of a partially blind person (independent of his/her income), up to a maximum of about 11,300 euros/year in case

Table 4.3 Older Italians receiving state care allowances for total dependency 1984–2005

Year	Per cent of people aged 65+ receiving state care allowances for total dependency (as per cent of total population aged 65+)						
	Total	By age group			By geographic area (per cent of increase to previous year)		
		65–69	70–79	80+	North	Centre	South and Islands
1984	2.7	–	–	–			
1987	3.0	–	–	–			
1991	5.0	–	–	–			
1995	6.7	–	–	–			
1996	6.2	–	–	–			
1997	5.9	–	–	–			
2001	5.5	1.4	3.1	16.1			
2002	6.0	1.5	3.5	16.8			
2003	6.5	1.6	3.8	17.7	+ 10.3	+ 14.4	+ 13.0
2004	7.2	1.7	4.1	19.1	+ 10.9	+ 11.5	+ 9.7
2005	7.7	1.8	4.4	20.4			

Sources: until 1997: Lamura et al. 2001; after 2001: Da Roit 2006: 293; by geographic areas: own calculations on data by Mesini and Gambino 2006: 53

of a totally blind person needing permanent external help and with an income lower than 13,700 euros/year (representing a care allowance of 680 euros/month and a disability pension of roughly 240 euros/month). Table 4.3 illustrates how substantial the increase in the number of recipients has been of these allowances over the years, referring to those granted to older persons who are 100 per cent disabled and need permanent external help (*indennità di accompagnamento*).

In the two decades between 1984 and 2005 the percentage of the older population receiving this allowance almost tripled, reaching 7.7 per cent of the population over age 65 in 2005. This trend – occurring for all age groups and geographical areas – can hardly be ascribed to a real increase in the percentage of older people affected by severe disability or illness since, as already observed, the health status of older Italians has actually been showing clear signs of improvement in recent decades. The explanation might rather be found in the long standing phenomenon of misuse of these allowances as a hidden form of income supplementation allocated irrespective of real care needs (Paci 1990: 83). This is especially common in some central and southern regions of the country (Adamo et al. 1997: 103), where in 2005 recipients of this allowance

reached 7.3 and 8.4 per cent respectively, compared to 6.4 per cent in the north of the country (Mesini and Gambino 2006: 53). When controls became stricter – as occurred for instance in the mid 1990s following a radical political change (Lamura et al. 2001) – the number of beneficiaries dropped substantially (e.g., from 6.7 to 5.2 per cent between 1995 and 2001), only to start increasing again afterwards. In the last decade further means-tested care payments have been introduced by several regions and municipalities, with the aim of supporting home care for (mostly older) dependent persons (Lamura et al. 2001) and these are estimated to add up to a monthly average of 300–350 euros per recipient (Mesini and Gambino 2006: 54–56).

Municipal Social Services

Italy has strong regional variation in both the extent and the types of municipal social services; per capita expenditure by regions and municipalities on social care in the north of the country is often double that recorded in the south (Adamo et al. 1997: 116–123; Caltabiano 2004: 7). These geographical inequalities

Table 4.4 Italian regions by prevalent types of welfare regimes (mean values by group of regions, 2000)

	Munificent welfare (Alpine regions)	Efficient welfare (Northern regions)	Welfare under pressure (Central Italy+Sardinia)	Fragile familist welfare (South and Sicily)	Italy
Social care expenditure indicators	High	Medium-high	Medium-low	Low	
1. Per capita municipal care expenditure (euros)	127.3	113.5	97.5	51.0	88.2
2. Per cent age of care expenditure within total municipal expenditure (%)	8.5	7.7	6.1	4.3	6.1
3. Per capita regional care expenditure (euros)	454.6	51.5	36.3	27.2	78.7
4. Per cent age of care expenditure within total regional expenditure (%)	5.7	2.3	1.6	1.1	2.0
Social care demand indicators	High	Medium-high	Medium-low	Low	
5. Kindergarten places per 0–2 year old population (%)	9.9	10.7	9.8	3.3	7.8
6. Residential care beds per over-70 year old population (%)	5.6	4.9	2.0	1.5	2.9
7. Care homes for older people (n. / 10.000 over 65 year olds)	13.3	4.8	4.8	4.5	5.5
8. NGOs working in social care (n. / 10.000 inhabitants)	7.8	3.8	3.9	2.6	3.8
Demand for private social care	Low	Medium-high	High	Low	
9. Privately paid domiciliary workers (baby sitter, home carer etc.) (per cent of all families)	7.1	9.7	10.3	8.9	9.3
10. Monthly expenditure of families (euros)	2,328	2,421	2,114	1,832	2113
Demographic pressure: older people	Medium	High	High	Medium	
11. Over 70 year old population (%)	12.7	14.2	14.8	12.2	13.5
Family activation (type of family structure)	Medium-low (modern)	Medium-low (modern)	Medium-high (quasi-traditional)	High (traditional)	
12. Married persons who visit their non co-resident mother more than weekly (%)	56.5	56.8	62.2	71.7	63.6
13. Female employment rate	41.4	40.2	37.9	30.9	36.4
14. Young female employment rate (age group 20–34)	64.4	62.7	46.4	24.8	44.7
15. Large families (per cent families with over 5 members)	4.7	4.7	6.5	11.8	7.7

Source: Caltabiano 2004.

are so remarkable in terms of care delivery mechanisms that some observers have distinguished Italian regions into different “welfare regimes”, identifying four main types – “munificent”, “efficient”, “under pressure” and “fragile familist” (see Table 4.4). Comparing the different types confirms the existence of a negative association between levels of formal and informal care – in

areas with lower public social care the family’s contribution is often higher (Caltabiano 2004). According to this classification, the demand for private care services is higher in those regions with regimes of the “efficient” and “under pressure” welfare types, where the higher impact of population ageing is not compensated for by the resources made available for public care services.

Table 4.5 Over 65-year-old Italian population in residential care 1999–2003

	1999		2003		Per cent absolute variation 1999–2003
	Absolute number	Per cent of older population	Absolute number	Per cent of older population	
Females	169,352	3.8	174,367	2.7	+ 3.0
Males	53,197	1.3	52,948	0.8	– 0.5
Total	222,548	2.2	227,315	2.1	+ 2.1

Source: own elaborations on ISTAT data (2006: 370).

As already mentioned, municipal social care – mainly consisting in the assessment of needs, provision of allowances, home care services (or SAD, *Servizi di Assistenza Domiciliare*, mainly house cleaning and personal care) and day-care support – is usually granted on a means-tested basis. Recent data (ISTAT 2006c) show that only 1.6 per cent of the older population lives in households benefiting from municipal home care, revealing how marginal this form of support still is in Italy. Another core activity of municipalities is however the provision of “social” residential care (to be distinguished from the above mentioned long-term care provided by rehabilitation or post-acute facilities, funded by the health care system), whose over 65 year old recipients currently number just under 100,000 persons, of which about 45 per cent are dependent persons (Mesini and Gambino 2006: 62). Due to the rationalisation of the hospital system already mentioned, as well as to the increasing employment of migrant homecare workers, inmates of residential care facilities have become much older and more severely disabled, putting pressure on facilities not necessarily designed to meet this kind of need (Lamura et al. 2001; Tinti 2004). On the other hand, the number of older Italians living in residential care settings has shown only a very slight increase in recent years, in any case at a slower pace than the rise in the overall number of older people, so that in 2003 the proportion of them living in care homes has actually decreased to 2.1 per cent (Table 4.5). This confirms a long-term trend already observed during the 1990s, when the percentage of Italians over 85 years old living in residential care settings almost halved (dropping between 1991 and 2001 from 14 per cent to less than 8 per cent for women and from 7 to 3 per cent for men) (Tomassini et al. 2004: 29).

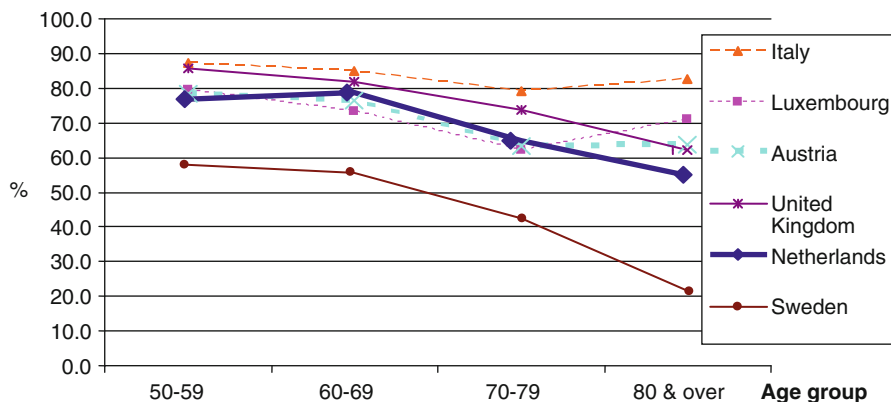
This trend can partly be explained by the peculiar (familistic) legal system of “alimony”, according to which in Italy any cognitively independent per-

son has the legal right freely to choose whether and from whom he/she wants to ask for help in case of physical care need, whatever his/her age. Recently, however, many municipalities have adopted the (illegal) praxis of requiring the older person’s family network to contribute to the care costs not covered by the older person’s own resources, without asking for the older person’s permission (Lamura et al. 2001). This is particularly common in the case of residential care, which many older Italians could not afford independently and for which municipalities are by law obliged to meet the remaining costs (usually amounting to between 500 and 1500 euros monthly per person). In an attempt to recoup at least part of this amount, many municipalities demand payments from the relatives, even though legally the only person entitled (but not obliged) to ask for such “alimony” from his/her relatives is the older person himself/herself (Dogliotti 1994: 76–82). This has encouraged more families to seek alternatives to residential care, often privately paid home care.

Family Care of the Older

In Italy only one older person in three (34 per cent) dies in a hospital, compared to much higher rates (between 50 and 80 per cent) in countries like the United States, Canada or France (Buratta and Cialesi 1996: 481). This can be interpreted as a “hard” indicator of the still traditionally strong support provided by the Italian family, combined with the aforementioned low availability of long-term care facilities. When need arises, indeed, most older Italians still receive the necessary support within their own (often extended) family network, with whom they often share a so-called

Fig. 4.5 Is there someone who would take care of you as long as needed in case of sickness or disability? (per cent of “yes” by country and age group)



Source: own elaborations on ESAW data 2003

“intimacy at a distance”. In other words, older Italians tend to have more frequent family contacts than their peers in other countries and above all, in times of sickness or disability, they more frequently count on “someone to take care of them for as long as needed” (see Fig. 4.5)¹ This phenomenon is particularly relevant in the over 80 year old age group, for which the positive differential between older Italians and especially Northern Europeans becomes quite remarkable, as does that for other social support resources (Burholt et al. 2003), material security (Lamura et al. 2003) and psychosocial factors such as the prevalence of loneliness (Lamura et al. 2006).

Family care is therefore a widespread phenomenon. It may include help in performing activities of daily living in cases of disability; transfer of financial or material resources to alleviate poor economic conditions; assistance to reduce the impact of disability, including when the older person is admitted into an institution; or coordination and enhancement

of home care services, when these are available. Support from other informal care sources – such as neighbours, friends and voluntary organisations – is also available but to a much less substantial extent (Lamura et al. 2001): data from 2003 show that less than half of older Italians can count, in case of need, on the help of friends (46.8 per cent of men and 41.6 per cent of women) or neighbours (46.8 per cent of men and 49.2 per cent of women) (ISTAT 2006c). Especially for most heavy tasks and for meeting long-term care needs associated with a chronic deterioration of the older person’s health status, the most common solution has instead become the employment of privately paid migrant care workers. One reason for this (besides other “structural” explanations that will be reported in more detail in the paragraph below) is that, together with Greek families, Italian households consider the “timeliness” of the support received from care services as the most relevant characteristic, besides the “ability of care workers to treat the older person with dignity and respect” (although this is similarly stressed in all countries involved in the cross-national study EUROFAMCARE²) (Lamura et al. 2006: 170). This “tailored”

¹ The data reported in this figure are elaborated from those collected within the European Study on Adult Well-being (ESAW), which, as part of a broader project initiated by the Indiana University Center on Aging and Aged under the directorship of Dr. Barbara Hawkins (http://www.indiana.edu/~caa/gai_mission.html), aimed to develop a model of Ageing Well by estimating the contribution of five key components (physical health and functional status; self-resources; material security; social support resources and life activities). Funded in 2002–2003 by the European Union (contract n. QLK6-CT-2001-00280), the survey reached an average of about 2000 non institutionalized adults aged 50–89 per country in Austria, Italy, Luxembourg, the Netherlands, Sweden and the United Kingdom (for further details see the project’s website in: <http://www.bangor.ac.uk/esaw/>).

² The EUROFAMCARE project – funded by the European Commission for the years 2003–2005 (contract n. QLRT-2001-02647) aimed to evaluate the situation of family carers of older people with regard to the existence, familiarity, availability, use and acceptability of supporting services. To this end., a comparative survey was carried out among almost 6.000 family carers providing at least four hours of care per week to an older family member in six nations (Germany, Greece, Italy, Poland, Sweden and the UK). For further details refer to the project’s website: <http://www.uke.uni-hamburg.de/extern/eurofamcare/>

care is certainly one of the main advantages of using migrant home carers.

The support that the Italian family is able to provide is however under growing pressure. The fall in the fertility rate of recent decades has already started to reduce the potential support ratio (i.e., the number of persons aged 15–64 for each person aged 65 or older), which fell from 7.9 in 1950 to 4.1 in 1995 and 3.4 in 2005 (ISTAT 2006d: 353), but is expected to decrease further (unless very dramatic changes occur) to 1.5–2.2 (United Nations 2000: 43–45). The reduction in the average family size – which dropped from an average of 4.0 members in 1950 to less than 2.6 in 2004 (ISTAT 2006a) – has diminished the possibility of providing easy intra-household family care, and therefore increased at the same time the dependency of single older persons upon the wider community.

The Challenge of Reconciling Professional Work and Care Responsibilities

Besides the ongoing reduction of the potential support ratio and the shrinking household size reflecting the disappearing of the multi-generational household, another major factor that might in the future have a negative impact on the amount of potential family support in Italy is represented by the growing and longer participation of women in the labour market. Between 1994 and 2005 the female participation rate (i.e., the ratio between the female labour force and the female population aged 15–64) increased from 42.4 to 50.7 per cent (OECD 2005: 17 and 2006), while the female employment rate in the 55–64 age group rose from 13.6 to 20.8 per cent (EUROSTAT 2006). This indirectly reduces the availability of the core contributors to elder care, traditionally women in the age of 45–64: according to the EUROFAMCARE survey, the mean age of Italian carers – 77 per cent of whom are women – is indeed 53.4 years (Quattrini et al. 2006: 70).

Further evidence of the difficulties currently faced in Italy by those who try to reconcile participation in the labour market with informal family tasks can be inferred by the nature of female employment. In Italy this is still characterised by a higher marginality and discontinuity compared with male employment; for example, in 2005 only 3.3 and 5.5 per cent

respectively of Italian men worked part-time in the age groups 30–49 and 55–64, compared to 27.6 and 18.5 per cent for women (Aliaga and Romans 2006: 9). It is therefore not surprising that sometimes women who are overburdened with both professional and caregiving tasks decide (not always willingly) to give up paid work: a choice leading not only to a loss of immediate income but also in the long-term to lower pension benefits, as well as possible negative health outcomes (Baldassarre 1995).

In this respect, EUROFAMCARE data show that, not unlike reports of family caregivers in other European countries (Lamura et al. 2006), Italian family carers of older people experience a variety of restrictions on work due to their caregiving involvement (Quattrini 2006: 75–76). The most widespread is reduction in working hours – which affects almost 14 per cent of all family carers who are employed – followed by difficulties experienced in developing one's career (5 per cent of cases) and the need to work on an occasional basis only (5 per cent). It is further worth mentioning that restrictions are reported also by non employed carers, who complain both about the impossibility of work (in almost one in ten cases) as well as the fact that they had to give up employment in order to provide care (in over 7 per cent of cases). In almost all circumstances women are more frequently affected by restrictions than men, confirming that the rigidity of the Italian labour market, where part-time work is legally limited to a certain percentage of the employed workforce, has a relevant (negative) impact on women's ability to balance professional and caring responsibilities (Del Boca et al. 2004: 20–21). It is therefore not surprising that Italy – together with Greece and Ireland – is one of the countries with the highest percentage (almost 45 per cent) of women aged 55–64 declaring that they are not “active” on the labour market due to family responsibilities (Van Bastelaer and Blöndal 2003: 5–6).

The Employment of Foreign Migrants as Live-in Home Carers

In the light of the above, it is clear that the Italian Welfare State has taken advantage of, and in turn generated, downright exploitation and lack of recognition of unpaid family work (Sgritta 1996). A further development is the already mentioned phenomenon

Table 4.6 Home care workers in Italy by nationality (1991–2005)

	Total	of whom with foreign nationality	Per cent
1991	181,096	35,740	16.5
1995	192,942	67,697	35.1
2000	259,971	133,837	51.5
2001	267,434	138,860	51.9
2002	511,034	380,125	74.4
2003	538,517	408,503	75.9
2004	493,012	366,075	74.3
2005	730,000*	600,000*	82.2*

*Estimates including applications presented within the 2006 regularisation campaign.

Sources: until 2004: INPS (corresponding year); 2005: CISL 2006.

of families employing migrants, often on a live-in basis, as home care workers. This arrangement has dramatically increased in recent years, to an extent that exceeds in quantitative terms (cf. Table 4.6) any previous pattern observed in other industrialised countries (Neysmith and Aronson 1997: 482). In 2005, over 10 per cent of households in Italy and 5 per cent in Greece, with a dependent older person employed such a migrant carer (Lamura et al. 2006: 10). In Italy this trend, already accelerating in the mid 1990s (Socci et al. 2003), has two major characteristics: the remarkable expansion in the number of households employing home care personnel (which has almost quadrupled in the last 15 years) and the fact that this expansion has taken place exclusively thanks to the injection of a newly immigrant labour force, making this sector de facto an “ethnic niche” represented by non Italians in almost 9 cases out of 10.

This “ethnification” of the elder care work in Italy has reached the point of overshadowing its traditional feminisation, as reflected by data on the gender composition of migrant carers, still overwhelmingly women but with an increasing proportion of men migrant carers (males formed 20 per cent of the total in 2001, Sarti 2004: 6–7). It should be underlined that, after the initial prevalence of migrants from countries and areas culturally related to the Italian value system (such as the Philippines and South America), the main sources of the past five years have been Eastern European countries facing the hardship of the post-Soviet Union economic crisis – Poland and (especially after its inclusion as an EU-member state) Ukraine and Romania (Caritas/Migrantes 2006) – all countries

where family care is still considered the “normal” way to provide elder care (Melchiorre 1997). Several pull factors have also operated to attract this workforce to Mediterranean countries: besides the already mentioned recent increase in female employment and the traditional preference for care payments (rather than direct care services), a peculiar role is undoubtedly played by the cultural vision that care in general (and older care in particular) is to a large extent the responsibility of family (and children); to this may be added the related aversion to residential care (much stronger than in Northern Europe) and the propensity to pay privately for home care (Alber and Köhler 2004: 55–80).

This phenomenon of gradual substitution or integration of privately paid support into family care is reflected by the fact that the number of older Italians receiving external (paid or unpaid) help has increased between 1983 and 1998 from 6 to 16 per cent, reaching its highest proportion among the population over age 80 (40 per cent, compared to 26 per cent in 1983) (Sabbadini 2003: 86–87). This trend accelerated in 2002, when a legalisation campaign was launched by the Italian government to regularise the position of undeclared immigrants in the Italian labour market. Care work was one of the few accepted grounds for legally remaining in the country, thus both becoming institutionalised and forming an incentive to new migration (Polverini and Lamura 2004). A further reason for this trend has been a historical shortage of nursing staff compared to a relative abundance of medical staff (WHO 2006: 192), so that some nursing functions have been reduced to a minimum in health care services (including hospital care), resulting in

an inappropriate delegation of these responsibilities to older people's families. The same phenomenon explains the recent rapid increase in the number of foreign-born staff both in hospital and residential care facilities, where over 20,000 foreign nurses were employed in 2005 (SIMM 2006).

Future Developments and Challenges

One major change currently taking place in Italy is the introduction of a "long-term care fund" (*fondo per le non autosufficienze*), planned within the 2007 budget bill, which is expected to make available resources up to 50 million euros for 2007 and 200 million in each of 2008 and 2009. The fund has been widely discussed in the last decade, and aims to allow experimentation with innovative care models and measures promoting a higher integration of available services and interventions, in cooperation with local authorities (which are constitutionally responsible for the implementation of social care). To this end, the government is also planning to define a minimum set of individual rights to social care that citizens can expect to be fulfilled, irrespective of which region or municipality they live in (Geria 2006).

A similar, but much more generous fund has recently been launched in Spain, where the national government has budgeted over 12.6 billion euros for the period 2007–2015, to which an almost similar amount will be added by regional authorities (Ministerio de trabajo y asuntos sociales 2006). The bill has identified three main levels of dependency and in the first year support will be provided to the most severely disabled persons only (i.e., requiring continuous external assistance). It will gradually be extended to other levels of dependency in the following years. Although the new system will give priority to the development of public care services (or provided under public control), if these are not available or sufficient care allowances will be paid to recipients so that they can acquire private care services.

A comparison between these current Spanish and Italian efforts highlights the relatively low level of resources being made available in Italy for implementation. Although this may partly be justified by the existence of other allowances and interventions already available to Italian recipients, a true reform of the

country's long-term care system is considered by many observers to be impossible without investing greater resources, in the light of the traditionally low level of Italian public expenditure (Gruppo per la riforma dell'assistenza continuativa 2006). This challenge will have to be managed in parallel with the search for ways to increase the currently low public expenditure assigned to prevention, rehabilitation and primary care, compared to the larger resources being absorbed by hospital and acute care (Banchero 1998; Taroni 2003). If this does not occur, the burden of caring for the increasing number of older people affected by chronic pathologies will be transferred from the health care system to the social sector – notoriously weaker in Italy from an organisational and financial point of view – and therefore de facto to the older people's families.

A further focus of Italy's policies on older people will necessarily be the promotion of a more systematic and institutional collaboration between the family and the network of formal supports. While in the mid 1990s a major priority was the appropriate training of family caregivers, today the priority has become the training of the migrants employed as care workers by many Italian households. This, however, cannot be considered sufficient and should be accompanied by a more systematic recognition of the right of family caregivers to respite measures and by legally acknowledging informal care activities as a form of work within the home which, as such, has to be safeguarded. Important steps towards this goal could be taken by the expansion of short- and mid-term respite services (such as day-care centres), by higher tax exemptions for care related costs (currently limited to 19 per cent of incurred costs, up to a maximum of about 3,400 euros per year) (Lamura and Melchiorre 2005), as well as by pension benefits related to the time that family members dedicate to caregiving tasks, as already available in other European countries like the UK and Germany. The scarce recognition of informal caregiving in Italy is evident even in the availability of quantitative data on the topic: current surveys include (with few exceptions) only questions related to care provision outside the household, while in countries like Italy, characterised by a relative high level of inter-generational coresidence, most care exchanges occur between household members. The substantial amount of support that household members provide during their lives is therefore not acknowledged, while it would be fair to count it as an important share of national social protection accounts.

Finally, as far as the *labour market* is concerned, there is an urgent need to increase the period of paid leave to care for a dependent relative – this being currently limited to a maximum of 3 days per month, with an additional possibility of up to 24 months on an unpaid basis only and without pension benefits – and to develop part-time work opportunities to allow people to combine professional and caring responsibilities, thus warding off the stress potentially resulting from caregiving activities only. At the same time, more specific initiatives should be undertaken to legalise the widespread undeclared employment of migrant home care workers, in order to prevent and tackle the exploitation (from both sides) possibly occurring outside the legal framework, as well as to improve the quality of care provided by this kind of staff and, on an international basis, to counterbalance the “care drain” of skilled and/or young workers in the source countries.

References

- Abate G, Bavazzano A, Di I (1995) Assistenza Domiciliare Integrata (A.D.I.). Indagine conoscitiva sulla situazione nazionale. Roma: Consiglio Nazionale delle Ricerche (Progetto Finalizzato Invecchiamento)
- Adamo S, Brunetti M, Dragosei L (1997) Il ridisegno della spesa sociale. Studi sul welfare italiano. 3° rapporto: L'assistenza. Roma, Editrice Libertà
- Alber J, Köhler U (2004) Health and care in an enlarged Europe. European Foundation for the Improvement of Living and Working Conditions, Dublin, Ireland
- Aliaga C, Romans F (2006) The employment of seniors in the European Union. Statistics in Focus, Population and Social Conditions, 15. EUROSTAT (retrieved on December 15, 2006 from: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-NK-06-015/EN/KS-NK-06-015-EN.PDF)
- Baldassarre G (1995) Il ruolo della famiglia nell'assistenza all'anziano non autosufficiente: problemi, risorse, proposte. *Giornale di Gerontologia* 43(6):303–311
- Banchero A (1998) L'offerta di servizi: dall'assistenza primaria alla long-term care. In M Trabucchi, F Vanara (eds) *Rapporto Sanità '98. Priorità e finanziamento del Servizio sanitario nazionale: le fragilità*. Bologna: Il Mulino 315–343
- Banfield E (1958) *The moral basis of a backward society*. Free Press/University of Chicago, Chicago
- Barbagli M (1997) Family and kinship in Italy. In: Gullestad M, Segalen M (eds) *Family and kinship in Europe*, Pinter, London, pp 33–48
- Billari FC, Castiglioni M, Castro Martin T, Michelin F, Ongaro F (2002) Household and union formation in Mediterranean fashion: Italy and Spain. In: Klijzing E, Corijn M (eds) *Dynamics of fertility and partnership in Europe: insights and lessons from comparative research*. United Nations, Geneva, pp 17–41
- Burrata V, Crialesi R (1996) Le famiglie dei disabili: profilo socio-demografico e relazionale. *Rassegna Italiana di Sociologia* 37(3):477–499
- Burholt V, Wenger G, Lamura G et al (2003) *European Study of Adult Well-being: Social Support Resources Comparative Report*, Report to European Commission, Brussels, Centre for Social Policy Research and Development, Institute for Medical and Social Care Research, University of Wales, Bangor (retrieved on December 19, 2006 from: <http://www.bangor.ac.uk/esaw/social%20resources%20final%20report.pdf>)
- Caltabiano C (2004) Il prisma del welfare: analisi dei regimi socio-assistenziali nelle regioni italiane. Roma, IREF (retriever on December 19, 2006 from <http://www.welfare.gov.it/NR/rdonlyres/eznwgrop4gkm4qtluxh4d62eee6b624dugj4qyp6jexrq3syclra7kynrzy3avkkigfdniwcfzikzj/analisiwelf.pdf>)
- Carbonin PU, Manto A, Pahor M, Pedone C, Carosella L (1997) Il ricorso ai servizi sanitari: risultati dello studio del Gruppo Italiano di Farmacoepidemiologia nell'Anziano (GIFA) sulle caratteristiche dell'ospedalizzazione nelle divisioni di Geriatria e di Medicina Interna in Italia. In: *La salute degli anziani in Italia. Atti del Convegno tenuto a Roma il 21–22 marzo 1995*. Roma: CNR-Istituto di Ricerche sulla Popolazione: 91–110
- Caritas/Migrantes (2006) *Immigrazione. Dossier statistico 2006. XVI rapporto sull'immigrazione*. Roma: IDOS – Centro Studi e Ricerche (retrieved on December 20, 2006 from: http://www.immigra.net/documenti/caritas_sintesi_dossier2006.pdf)
- CISL (2006) *Stime CISL lavoratori stranieri in Italia*. Roma (retrieved on December 20, 2006 from http://docs.cisl.it/Immigrati/I045C55C1.0/stime_CISL_2006.pdf)
- Crumley B (2003) Elder careless. *Time Europe*
- Daatland SO, Herlofson K (2003) “Lost solidarity” or “Changed solidarity”? A comparative European view of normative family solidarity. *Ageing Soc* 23(5):537–560.
- Dalla Zuanna G (2001) The banquet of Aeolus: A familistic interpretation of Italy's lowest low fertility. *Demogr Res* 4(5):133–161
- Da Roit B (2006) La spesa per l'assistenza continuativa in Italia. In: Gori C (ed) *La riforma dell'assistenza ai non autosufficienti. Ipotesi e proposte*. Il Mulino, Bologna, pp 287–315
- Del Boca D, Pasqua S, Pronzato C (2004) Why are fertility and women's employment rates so low in Italy? Lessons from France and the U.K. Discussion Paper n. 1274. Bonn: IZA (retrieved on December 20, 2006 from: <ftp://repec.iza.org/RePEc/Discussionpaper/dp1274.pdf>)
- Dogliotti M (1994) La posizione dei parenti e dei pubblici poteri. In: Dogliotti M, Ferrario E, Santanera F (eds) *I malati di Alzheimer: esigenze e diritti*. Torino: UTET Libreria
- Dykstra PA (1997) The effects of divorce on intergenerational exchanges in families. *The Netherlands' J Soc Sci* 33(2):77–93
- EUROSTAT (2006) *Data on Population*, (retrieved on December 15, 2006 from: http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1090,30070682,1090_30298591and_dad=portaland_schema=PORTAL)
- Farkas JI, Hogan DP (1995) The Demography of changing intergenerational relationships. In: Bengtson VL, Schaie

- K.W, Burton LM (eds), *Adult intergenerational relations*. New York: Springer Publishing Company
- Geria A (2006) *Le politiche sociali e familiari nel disegno di legge finanziaria per il 2007*. (retriever on December 12, 2006, from the CISL website: <http://htm.cisl.it/sito/contenuti/finanziaria2007/PoliticheSocialiFamiliari.pdf>)
- Gjonca A, Tomassini C, Toson B, Smallwood S (2005) Sex differences in mortality, a comparison of the United Kingdom and other developed countries. *Health Stat Q* 26:6–16
- Glaser K, Tomassini C (2000) Proximity to children: A comparison of Britain and Italy. *Gerontologist* 40(6):729–737
- Golini A (2003) Current demographic setting and the future of aging. The experience of some European countries. *Genus LIX*(1):15–50
- Grundy E (1996) Population ageing in Europe. In: Coleman D (ed) *Europe's populations in the 1990s*, Clarendon Press, Oxford, pp 267–299
- Gruppo per la riforma dell'assistenza continuative (2006) *Riformare l'assistenza ai non autosufficienti in Italia*. In: Gori C (ed) *La riforma dell'assistenza ai non autosufficienti. Ipotesi e proposte*, Bologna, Il Mulino, pp 423–472
- Höllinger F, Haller M (1990) Kinship and social networks in modern societies: A cross-cultural comparison among seven nations. *Eur Sociol Rev* 6(2):103–124
- INE (2006) Population statistics (retrieved on December 15, 2006 from <http://www.ine.es/inebase/index.html>)
- INPS (different years) *Banca dati dell'osservatorio sui lavoratori domestici* (retriever on December 20, 2006 from: <http://www.inps.it/home/default.asp?sID=%3B0%3B4774%3B4781%3B4962%3B&lastMenu=4962&iMenu=1&iNodo=4962&s;http://www.%3A%2F%2FbanchedatISTATistiche%2EInps%2Eit%2Fmenu%2Fdomestici%2Fmain%2Ehtml>)
- ISTAT (2005) *Sistema sanitario e salute della popolazione. Indicatori regionali – Anni 2001–2002*. Roma (retrieved on December 8, 2006 from http://www.ISTAT.it/dati/catalogo/20050622_00/Inf_05_14_Sistema_sanitario_salute_popolazione.pdf)
- ISTAT (2006a) Population statistics (retrieved on December 15, 2006 from <http://demo.ISTAT.it/>)
- ISTAT (2006b) *Tavole di mortalità* (retrieved on December 15, 2006 from http://www.ISTAT.it/salastampa/comunicati/non_calendario/20061024_00/testointegrale.pdf)
- ISTAT (2006c) *Indagine Multiscopo sulle Famiglie e Soggetti Sociali*, File standard of data, authors' own calculation
- ISTAT (2006d) *Rapporto Annuale. La situazione del Paese nel 2005*. Roma (retrieved on December 7, 2006 from http://www.ISTAT.it/dati/catalogo/20060524_00/rapporto2005.pdf)
- Kalogirou S, Murphy M (2006) Marital status of people aged 75 and over in nine EU countries in the period 2000–2030. *Eur J Ageing* 3(2):74–81
- Kobrin FE (1976) The primary individual and the family: Changes in living arrangements in the United States since 1940. *J Marriage Fam* 38:233–239
- Lamura G, Melchiorre MG, Quattrini S, Mengani M, Albertini A (2001) *Background report on Italy*. In: Philp I. (ed) *Family Care of Older People in Europe*, IOS Press, Amsterdam, pp 97–133
- Lamura G, Balducci C, Melchiorre MG et al (2003) *Comparative report on ageing well and material security in Europe*, Report to the European Commission, Brussels, Centre for Social Policy Research and Development, Institute for Medical and Social Care Research, University of Wales, Bangor (retrieved on December 19, 2006 from: <http://www.bangor.ac.uk/esaw/material%20security%20final%20report.pdf>)
- Lamura G, Melchiorre G (2005) The situation of family carers of older people in Italy. Paper presented at the conference *Proches des personnes malades, dépendantes ou handicapées, Droits et statut des aidants informels en Europe*, Paris, 26 November 2005
- Lamura G, Ferring D, Mnich E (2006) Loneliness and economic resources of older people in Europe: Recent empirical evidence and policy implications. Paper presented at the *Technical Meeting for the Madrid Implementation Plan of Action on Ageing*, Segovia (Spain), November 26
- Lamura G, Mnich E, Döhner H (2006) The future of informal care of older people in Europe: Trends and challenges. Paper presented at the *International Workshop on "The contribution of ICTs to equal opportunities and work-life-balance of informal carers for older people"*, Brussels, 30 November (retrieved on December 19, 2006 from: <http://www.einclusion-eu.org/ShowDocument.asp?CaseDocumentID=98>)
- Lamura G, Polverini F, Melchiorre MG (2006) Migrant care workers in long-term care: lessons from the Italian case. Paper presented at the *Academy Health Annual Research Meeting*, Seattle, 25–27 June (retrieved on December 11th, 2006 from: <http://www.academyhealth.org/2006/607/lamurag.ppt>)
- Lamura G, Wojszel B, Mnich E, Krevers B, McKee K, Messtheos E (2006) Experiences and preferences of family carers in the use of care and support services. In: Lamura G, Döhner H, Kofahl C (eds) *EUROFAMCARE: The Trans-European Survey Report*, LIT Verlag, Münster, pp 144–182 (retrieved on December 20, 2006 from: http://www.inrca.it/CES/EuroFamCare/Documenti/Teusure_Eng.pdf)
- Lowenstein A, Katz R, Mehlhausen-Hassoen D, Prilutzky D (2003) Une comparaison transnationale de la solidarité inter-générationnelle. *Retraite et Société* 38:52–75
- Mancini J, Bleiszner R (1989) Aging parents and adult children. *J Marriage Fam* 51:275–290
- Melchiorre MG (1997) *Le donne immigrate*. In: Moretti E, Vicarelli G (ed) *Una regione al bivio. Immigrati e mercato del lavoro nella Regione Marche*. Ancona: Osservatorio Regionale del Mercato del Lavoro, pp 85–151
- Mesini D, Gambino A (2006) *La spesa per l'assistenza continuativa in Italia*. In: Gori C (ed) *La riforma dell'assistenza ai non autosufficienti. Ipotesi e proposte*, Bologna, Il Mulino, pp 45–82
- Ministerio de trabajo y asuntos sociales (2006) *Nota de prensa: El congreso aprueba la ley de dependencia*. Madrid (retrieved on December 12, 2006, from: <http://www.mtas.es/destacados/30-11NPDEPENDENCIA.pdf>)
- Neysmith SM, Aronson J (1997) Working conditions in home care: Negotiating race and class boundaries in gendered work. *Int J Health Serv* 27(3):479–499
- OECD (2005) *OECD in figures. Statistics on the member countries. 2005 Edition* (retrieved on December 14, 2006 from: <http://213.253.134.29/oecd/pdfs/browseit/0105061E.PDF>)
- OECD (2006) *Labour force statistics by sex and age*. Paris: OECD.Stat Web Browser (retrieved on December 14, 2006 from: http://stats.oecd.org/wbos/default.aspx?DatasetCode=LFS_D)

- Paci M (1990) *La sfida della cittadinanza sociale*. Roma: Edizioni Lavoro
- Pampel FC (1992) Trends in living alone among the older in Europe. In: Rogers A (ed) *Older migration and population redistribution: A comparative study*, Belhaven Press, London, pp 97–117
- Pampel FC (2003) Sex differences in mortality from lung cancer. *Popul Dev Rev* 40(1):45–65
- Pezzin L, Schone BS (1999) Intergenerational household formation, female labor supply and informal caregiving: A bargaining approach. *J Human Res* 34:475–503
- Polverini F, Lamura G (2004) Labour supply in care services. National Report on Italy. Paper prepared on behalf of the European Foundation for the Improvement of Living and Working Conditions (Dublin) and presented at the AARP International Forum on Long Term Care, Washington, USA, October 20, 2005 (retrieved from: http://assets.aarp.org/www.aarp.org/_articles/GAP/LabourSupplyinCareServices_ItalianReport.pdf)
- Principi A (2005) I trasferimenti monetari nazionali. In: Lamura G, Gori C, Hanau C, Polverini F, Principi A, Tomassini C (eds) *L'informazione statistica sull'assistenza agli anziani in Italia*. Roma, Commissione per la Garanzia dell'Informazione Statistica presso la Presidenza del Consiglio dei Ministri, pp 175–195
- Quattrini S (2006) Main characteristics of the Italian family carers' and older people's sample. In: Quattrini S, Melchiorre MG, Balducci C, Spazzafumo L, Lamura G (eds) *EUROFAMCARE: The National Survey Report for Italy*, INRCA, Ancona, pp 67–81. (retrieved on December 14, 2006 from: http://www.inrca.it/CES/EuroFamCare/Documenti/Nasure_Eng.pdf)
- Quattrini S, Melchiorre MG, Balducci C, Spazzafumo L, Lamura G (2006) *EUROFAMCARE: The National Survey Report for Italy*. Ancona: INRCA (retrieved on December 14, 2006 from: http://www.inrca.it/CES/EuroFamCare/Documenti/Nasure_Eng.pdf)
- Reher D (1998) Family ties in Western Europe: Persistent contrasts. *Popul Dev Rev* 24:203–234
- Robine JM, Jagger C, van Oyen H, Cambois E, Romieu I, Clavel A, Barker G, Le Roy S (2005) Are we living longer, healthier lives in the EU? Disability-free life expectancy (DFLE) in EU countries from 1991 to 2003 based on the European Community Household Panel (ECHP) (EHMU Technical report 2). Montpellier, European Health Expectancy Monitoring Unit (retrieved on December 7, 2006, from <http://www.hs.le.ac.uk/rees/ehemutest/pdf/techrep20507.pdf>)
- Sabbadini LL (2003) Donne che curano, donne che vengono curate. La rete di aiuti informali. In: Commissione Nazionale per la Parità e le Pari Opportunità tra Uomo e Donna (ed) *Curare ed essere curati: una opportunità, un diritto*. Presidenza del Consiglio dei Ministri, Roma, pp 73–92
- Santini A (1995) Continuità e discontinuità nel comportamento riproduttivo delle donne nel dopoguerra. Working paper, 53 Dipartimento di Statistica, Università di Firenze
- Sarti R (2004) Servizio domestico, migrazioni e identità di genere in Italia: uno sguardo storico. Paper presented at the seminar "The global chain of care", Turin, June 6th (retrieved from: http://www.uniurb.it/scipol/drs_servizio_domestico.pdf)
- Sgritta GB (1996) Famiglie e solidarietà intergenerazionale: transizione demografica o crisi politica? *Difesa Sociale* 175(5):15–34
- SHARE (2005) Health, ageing and retirement in Europe. In: Borsch-Supan A, Brüglavini A, Jurges H, Mackenbach J, Siegrist J, Weber G (eds). Mannheim Research Institute of the Economics of Aging (MEA)
- SIMM (Società Italiana di Medicina delle Migrazioni) (2006) Gli infermieri immigrati nella sanità italiana: un ulteriore apporto dopo l'assistenza nelle famiglie. Roma (retrieved on December 20, 2006 from: http://www.csmedi.it/n_admin/media/72.pdf)
- Socci M, Melchiorre MG, Quattrini S, Lamura G (2003) Older care provided by foreign immigrants: Lessons from the Italian case. *Generations Rev* 13(4):9–13
- Stuchbury R, Tomassini C, Glaser K (2006) Family support for older people: Determinants and consequences. Family care for older people in thirteen European countries. Strasbourg: European Science Foundation
- Sundström G, Samuelsson G, Sjöberg I (1989) Intergenerational transfers: Aging parents living with adult children and vice versa. *Zeitschrift für Gerontologie* 22:112–117
- Sundström G (1994) Care by families: An overview of trends. In (ed) *OECD Caring for frail older people. New directions in care*. OECD Social Policy Studies, 14: Paris, pp 15–55
- Sundström, G, Tortosa M (1999) The effect of rationing home help services in Spain and Sweden: A comparative analysis. *Ageing Soc* 19:346–361
- Taroni F (2003) Proiezioni demografiche e politiche sanitarie. In: Fiorentini G (ed) *I servizi sanitari in Italia*, Bologna, Il Mulino, pp 105–138
- Tinti V (2004) Sistema RUG: risultati della prima rilevazione. Paper presented at the conference "Il sistema RUG" (The RUG system), Agenzia Sanitaria Regione Marche, Ancona, 6 febbraio 2004
- Tomassini C, Wolf DA (2000) Shrinking kin networks in Italy due to sustained low fertility. *Eur J Popul* 16(4):353–372
- Tomassini C, Glaser K, Askham J (2003) Getting by without a spouse: Living arrangements and support of older people in Italy and Great Britain. In: Arber S, Davidson K, Ginn J (eds) *Gender and Ageing: Changing Roles and Relationships*. McGraw Hill: London, pp 111–126
- Tomassini C, Wolf DA, Rosina A (2003) Parental housing assistance and parent-child proximity in Italy. *J Marriage and Fam* 65:700–715
- Tomassini C, Glaser K, Wolf D, Broese van Groenou M, Grundy E (2004) Living arrangements among older people: An overview of trends in Europe and the USA. *Popul Trends* 115:24–34
- Tomassini C, Kalogirou S, Grundy E, Fokkema T, Martikainen P, Broese van Groenou M, Karisto A (2004) Contacts between older parents and their children in four European countries: Current patterns and future prospects. *Eur J Ageing* 1:54–63
- Tomassini C, Grundy E (2006) Culture or kinship: Demographic and other influences on living arrangements in mid and later life. *Entre nature et culture: Quelle(s) demographie(s)?* Chaire Quetelet 2002, Louvain-la-Neuve: Academia-Bruylant, L'Harmattan, pp 345–353
- United Nations (2000) Replacement migration. Is it a solution to declining and ageing populations? Population Division,

- Department of Economic and Social Affairs, United Nations Secretariat, New York (retrieved on December 12, 2006 from the website: <http://www.un.org/esa/population/publications/migration/>)
- Van Bastelaer A, Blöndal L (2003) Labour reserve: People outside the labour force. *Statistics in Focus, Population and Social Conditions*, 14. EUROSTAT (retrieved on December 15, 2006 from: http://www.eds-destatis.de/en/downloads/sif/nk_03_14.pdf)
- Vineis P, Paci E (1995) Epidemiology and the Italian national health service. *J Epidemiol Community Health* 49: 559–562
- Walker A (1993) Age and attitudes: Main results from a Eurobarometer survey. Commission of the European Communities: Brussels
- Weinick RM (1995) Sharing a home: The experiences of American women and their parents over the twentieth century. *Demography* 32(2):281–297
- Wolf DA (1994) The older and their kin: Patterns of availability and access. In Martin LG, Preston SH (eds) *Demography of aging*. Academy Press, Washington DC, pp 146–194
- WHO (2006) Working together for health. *The World Health Report 2006*. Geneva (retrieved on December 15, 2006 from: http://www.who.int/whr/2006/whr06_en.pdf)

Chapter 5

Demography of Aging in the Nordic Countries

Gerdt Sundström

Introduction

The Nordic countries, Denmark, Finland, Iceland, Norway and Sweden, have a long history of population aging. They were among the first countries to experience rapid population aging and this aging resulted in government commissions on pensions being formed in the 1800s. Concerns over population aging led to the formation of other commissions on how to foster higher fertility and how to provide public old-age care a few decades later.

We begin this chapter with an overview of the demography of aging in the Nordic countries from an historical perspective. This is followed by a discussion of contemporary patterns and those for the foreseeable future. Special emphasis is given to aspects of aging relevant for family networks and the giving and receiving of care, both formal and informal. The Nordic sources of reliable population records (going back to 1749 for Finland and Sweden) will be used to discuss population aging. We also draw on census data, government surveys and other data to fill out the picture. Where possible we provide evidence from all the Nordic countries but there is some unevenness in coverage and greatest attention is given to Sweden.

The Historical Context

When Swedish population data were collected for the first time in 1749 the results were immediately clas-

sified as state-secrets because they were considered politically sensitive. It was found that the country had only 1.8 million inhabitants, after experiencing a series of devastating wars with Russia, crop failures and epidemics. These early records show that 6 per cent of the population was old (aged 65+) at that time. During the later 1700s and the 1800s, as the Nordic countries underwent the demographic transition, there was rapid population increase and proletarianization. The proportion of old people in the populations of Nordic countries rose slowly in the nineteenth century, reaching 8 per cent in Sweden in 1900 (out of a quite youthful total population of about five million). In absolute terms, the number of old Swedes doubled in the four decades following 1860, as shown in Fig. 5.1. A century ago demographers were predicting further increases in the elderly population, though the main concern at that time was drastic declines of fertility (Sundbärg 1915).

Historical changes in marital patterns contributed to population aging by their effects on fertility. The increasing proportions of never-married persons in the Nordic populations during the 1700s and 1800s reflected increasing difficulties that young adults had in establishing independent lives. This occurred in spite of substantial emigration to the United States and other destinations. More men than women emigrated, causing a severe imbalance in the sex ratio: in the beginning of the 1900s there were about 1200 women of marriagable age for every 1000 men in

G. Sundström
Institute of Gerontology
School of Health Sciences
Jönköping University
Box 1026, SE-55111 Jönköping, Sweden
E-mail: gerdt.sundstrom@hhj.hj.se

Bibliographic note: The author has a background in sociology and social work and has mainly done work on family care and the public services for old people, in the Nordic countries and internationally. These studies have dealt with both micro aspects and macro features of care, such as local variations in needs and service coverage. A recent study for the Swedish government (2006) on informal caregiving is a response to growing interest in this topic in the Nordic countries.

Thousand persons

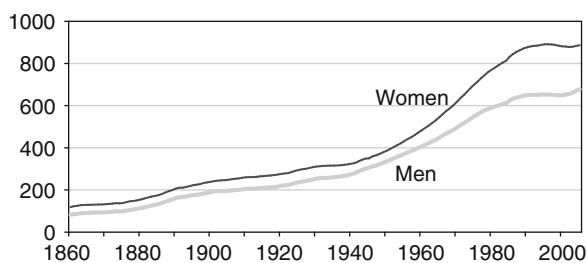


Fig. 5.1 Number of men and women aged 65 and older in Sweden, 1860–2005

Sweden, in Norway the ratio was about 1400 women for every 1000 men (ages 20–50). The “north-west European family system”, as it has been termed, implied that many people entered marriage quite late and many not at all. For the population over age 50 in Sweden in 1749, about 5 per cent of the men and 9 per cent of the women were never-married. (The large sex difference is explained by a severe shortage of men in these cohorts after devastating wars with Russia). By the 1920s, 19 per cent of the women and 12 per cent of the men were still single as they approached old age (60–64). Because very low rates of nuptiality continued up to WW II, rates of singlehood were high among elderly cohorts well past the 1950s. (Among Swedish people aged 60–64 in 1950, 14 per cent of the men and 21 per cent of women were still single.) The most important cause of rising proportions of old people in the Nordic countries was the long decline in fertility rates. However, there were some variations in population aging, as shown in Table 5.1. Iceland (with 50,000 inhabitants in 1703, 98,000 in 1900 and 299,000 in 2005) has a more youthful population than the rest on the Nordic countries. But overall the Nordic countries were among the first to experience population aging, because of increasing longevity and declining fertility.

Marital Status

The marital status of the elderly population varies somewhat across the Nordic countries, for historical and cultural reasons. Data in Table 5.2, giving marital status in 1950 and 2005, show a decreasing proportion of single and rising proportion of married elderly in all the Nordic countries since the middle of the twentieth century. Further, the large discrepancy in singlehood between men and women that existed around 1950, with more women being never-married, became much smaller or even reversed by 2000. The only exception to the decline in sex differences in never marrying has been in Finland, which had very heavy losses of men in the Second World War (proportionally among the heaviest of the participants in that war).

Marital status does not, of course, provide an accurate description of actual living arrangements or family forms and this may be the case even more in the Nordic countries than elsewhere. Common-law relationships, out-of-wedlock births and pregnant brides have long been relatively common in the Nordic countries. Statistics that indicate “untimely intercourse” (the ancient ecclesiastical term) are available for Sweden from 1911, when 11 per cent of the mothers had their first (legitimate) child too “early” (defined by us as within 8 months from the wedding). This proportion increased up to 1941–1945 when it reached 16 per cent (with much higher ratios for young brides). Rates of premarital conception were higher in socially homogeneous northern Sweden, for example, in the Skellefte area, where half of women marrying in the 1700s and 1800s were either in that predicament or already had one or more children before the marriage (Alm Stenflo 1989). Homesteads there – but not in southern Sweden – were of about equal size and the “risk” associated with having a premarital conception may thus

Table 5.1 Percentage distribution of old people (65+) in the Nordic countries 1900, 1940, 1980, 2000 and projection for 2020

	Denmark	Finland	Iceland	Norway	Sweden
Proportion 65+					
1900	7	5	6	8	8
1940	8	6	7	9	9
1980	14	12	10	15	16
2000	15	15	12	15	17
2020	21	23	15	18	21

Sources: National Central Bureaus of Statistics, projections refer to “middle alternatives”, when available.

Table 5.2 Percentage distribution of old people (65+) in the Nordic countries by marital status, 1950 and 2005

	Single	Married	Widowed	Divorced	Total
Denmark					
1950	12	51	36	2	100
2005	5	52	33	10	100
Finland					
1950	14	39	46	–	100
2005	9	50	30	11	100
Iceland					
1950	19	39	41	1	100
2005	10	54	27	8	100
Norway					
1950	17	46	36	1	100
2005	7	52	33	8	100
Sweden					
1950	15	46	37	2	100
2005	8	51	28	13	100

Sources: Official statistical publications and information from national statistical offices.

have been smaller for both parties involved. In Iceland today more than 60 per cent of children are born to an unwed mother and in the other Nordic countries the rate is well above a third of the newborn. It should be mentioned, however, that the unwed mothers usually live with the child's father. Even if this is a Nordic tradition, the pattern is now so common in Europe that in France in 2004, for example, nearly half of the newborn had unmarried parents.

Inspection of questionnaires from the 1954 survey of old Swedes (67+) shows that it was not rare to find remarriages, resulting in "his" and "her" children and there were also foster-children and children born before marriage. Likewise, quite a few people lived with a grandchild where the middle-generation was not present, probably because a daughter was away working or in a new marriage (SOU 1956: 1). Remarriage became less common over the next few decades but now seems to be on the increase among old people. To have grown up in an intact "biological" family is lower among older Swedish respondents than among the middle-aged who grew up when death no longer interrupted family trajectories as it had in the past. However, growing up in an intact family is now less common within younger cohorts that are affected by rising divorce rates among their parents.

Common-law unions are increasingly noticeable also among old people, although evidence on partnership is hard to come by. The discrepancies

between legal status and practice led Statistics Sweden to stop publishing projections of marital status and childlessness in the early 1990s; these projections increasingly appeared futile. In the Swedish case it emerges that 54 per cent of all old people lived with a partner (1 per cent were married but did not live with a spouse) in 2002–2003. About 5 per cent lived with a partner to whom they were not married and a remarkable 7 per cent had a non-coresident partner (a so-called LAT relationship – living apart together, Socialstyrelsen 2004b). The proportion of old people living in consensual unions was 1 per cent in Iceland in 2005 (based on our own calculations from Statistics Iceland data), 3 per cent in Denmark in 1987 (EGV 1989) and 3 per cent in Finland in 2005. In all countries consensual unions are also somewhat more common among old men than among women.

Household Patterns of Old People

As indicated above, marital status does not translate all too smoothly into living arrangements of old people. In general, most older people in the Nordic countries now either live alone or with a partner only, as coresiding with off-spring or other persons has become rare. A trend toward increasing household atomization holds for the populations at large. In Norway, which like

Finland was affected by housing shortages and other difficulties after the war, 12 per cent of all households contained relatives or nonkin in 1967, compared to 7 per cent just two decades later (information distilled from the ingenious Norwegian household surveys; Ås 1989). Census data in the Nordic countries rarely provide relevant data (censuses are no longer undertaken in Denmark and Sweden) to describe the household structure of older people in any detail but we may gain some evidence from surveys.

The stereotypical image of old people historically most often living with off-spring in complex households of three generations and/or similar constellations has some support in demographic studies but variations between local areas were often great (Moring 2003). Some northern areas in Sweden shifted from great complexity towards simpler, nuclear family types in the later 1800s (Egerbladh 1989). But in other areas with industrial centers, households grew more complex with more generations living together or with other types of household extension (Tedebrand 1999). This has been interpreted as a survival strategy along the lines described by Michael Anderson for England. Before 1800, many old people lived alone or just with their spouse but it is hard to pinpoint a single structure or development. Also, in Norway household structures varied a good deal and in Eastern and Northern Finland stem families were common (many of these vanished with the evacuation of Karelians away from the advancing Soviet army in 1940). Complex families may historically have been somewhat less common in Denmark (Moring 2003).

From a demographical perspective, the rural three-generation household stereotype is problematic, not only because it assumes that members of all three generations were alive at the same time but also because it often assumes that at least one generation was propertied. Possibly ownership of property was widespread a few centuries ago but around 1900, when most Swedes still lived in the countryside, the large majority of new fathers were proletarians. At most 25 per cent of the newborn in Sweden had a father who possessed real estate, judging from information on fathers' professions in the statistical yearbooks.

The trend in three-generation households can be assessed for Denmark thanks to a special analysis done in connection with the well-known 1962 three-country study (Shanas et al. 1968). A

representative subsample of 2700 persons in the Danish 1845 census was compared with data from 1962. It emerged that living alone among old people (65+) rose from 9 to 28 per cent and living just with one's spouse rose from 10 per cent to 45 per cent. In contrast, living with children shrank from 52 to 27 per cent over this time interval. At both times, most of the coresident children were unmarried and a majority of them lived with aging but still married parents (Stehouwer 1970, my own calculations on Table 3.7). In about one century the "typical" three-generation household had declined from 7 per cent of all households in 1845 to only 2 per cent in 1962. Two thirds of the three-generation households were headed by the second generation in 1845 and about half of them were in 1962. There were rarely at either time two complete families in these constellations and it seems that the arrangement was mostly a response to death, divorce, illness or some other calamity in either generation in the family.

Notwithstanding, these objections to simplified views of historical family patterns, it remains that coresidence among older people was relatively common in the recent past. For example, in 1954 about three out of ten old Swedes lived with one or more of their adult children, although only 9 per cent lived with a grandchild in the household. In 1975 these arrangements had shrunk to 9 per cent and 1 per cent, respectively. In Norway in 1973, 4 per cent of old (67+) people lived with grandchildren under age 16 (personal communication from Dagfinn Ås, Norges Byggforsknings-institutt). Of the grandchildren residing in Swedish households of old people in 1954, half were children of a married middle-generation, a quarter were the children of an unmarried daughter and a quarter were children without any parent present (own computations from original data). Thus, even when the household was extended, the stereotypical three generations household was rather unusual. However, it was indeed common to live in an extended family at some point in time, for example sometime during childhood. Surveys in Finland and Norway in 1983 show that three out of ten adults (25–65 year old) had lived at some time with relatives beyond parents and siblings when they were growing up. A minority of these children (7 per cent in Norway, 11 per cent in Finland) experienced this living arrangement in their own home, the rest in someone else's home. Thus many have experiences of growing

up in other people's households up to rather recent times (Sundström and Waerness 1987). And, even if fewer old people than expected lived permanently with their off-spring in the past, it was common that they spent their last year(s) of life in coresidence (Gaunt 1983).

To this perspective may be added information on adults living with their (aging) parents. This occurred for 14 per cent of the 30–44 year old persons living in seven rural Swedish parishes in 1880 but only 3 per cent of those living in Stockholm in 1900 or in all of Sweden in 1980–1981. Rates of coresidence with parents for adult children were higher in Finland (1978) and Norway (1981), with 7 and 6 per cent, respectively (Sundström 1985). In more recent decades, these rates have declined substantially, although they are still rather high among the never-married (especially men) and persons on early retirement due to illness. Interestingly, adults coresiding with parents in Sweden in the 1800s were about equally often married and single; in recent times the vast majority are single (never-married). Men all along made up the majority of the coresidents but more so today than in the past. It is not unusual to find off-spring with various handicaps among the adults living with aging parents today but this was proportionally less common in the past. This has been interpreted as today's aging parents having more resources than in the past, so that they are now better able to shelter off-spring who are unsuccessful in the housing-, marriage- and/or labor markets (Sundström 1987). Consistent with the resource perspective, children from working-class families move out much earlier than those from middle- and upper-class families.

A debate on how to interpret historical evidence on household structures of old people has also taken place in Sweden. As already indicated, there were large regional variations and there were many more old people who eventually moved in or joined households of family members before they died than appears from cross-sectional evidence (Gaunt 1987). Conflicts between the generations in these retirement arrangements were not unheard of and sometimes ended in court hearings (Gaunt 1983). The inclination for autonomy was, and is, strong among old people in the Nordic countries. It was common that the older party who shared house with a child tried to establish an independent "sub-household", with a kitchen of their own. In the records this may appear as generations

"living together", although the actual experience was one of substantial independence.

Propertied persons could set up formal retirement contracts (*undantagskontrakt*), where the older party – often about 50 years old – traded their property for shelter, food and care. Such contracts were frequently very concrete in their specifications and sometimes included assurance of care from a hired helper, should satisfactory help from the family not be forthcoming. Often a "decent burial" would also be part of the deal (Gaunt 1983, 1987). There are indications that coresidence between older and younger generations, contracted or not, was much more common on the smaller farm holdings than on the bigger ones (Hamrin 1954, Byggforskningsrådet 1979). Around 1910 about 10 per cent of old Swedes lived in these coresiding arrangements, in 1954 it was 6 per cent. Today these arrangements have vanished altogether in Sweden, although substantial numbers still remain in Norway (where new contracts are sometimes still established) and Finland.

Of particular significance is how common it is for old people to live alone, which may signify a situation of vulnerability but also is consistent with preferences of old people. In the earlier 1900s about a tenth – with large local variations – of elderly persons seem to have lived alone, based on cross-sectional Swedish data. Many of the rest shared living quarters with family and/or others, consistent with Danish household patterns in 1845 described above (Kjellman 1984).

Living arrangements are conditioned by material factors such as availability of affordable housing and access to family. An analysis of Norwegian household data for 1981 revealed that unmarried childless old persons often lived with siblings and those who lived with wholly unrelated persons usually were never-married persons who lacked both children and siblings. Generally speaking, the availability of family influenced both whether old people lived alone or with family (or others) and whom they lived with. Only about half of never-married old Norwegians lived alone in 1981 (33 per cent of the men, 54 per cent of the women; Guldbrandsen and Ås 1986). A similar conclusion was drawn from a tabulation in the three-country study in 1962, where it emerges that it was especially the never-married and childless who lived with siblings and that persons without close relatives were also more likely to live alone (Shanas

Table 5.3 Living arrangements of community-residing old people in Denmark, Finland, Norway and Sweden, 1954–2005. Per cent

	Denmark		Finland		Norway		Sweden	
	1962 65+	1988 70+	1950 65+	2005 65+	1953 67+	2001 67+	1954 67+	2002 65+
Living alone	28	53	18	38	21	42	27	40
With spouse* only	45	40	16	48	41	47	30	58
With spouse and children**			20	5		7	11	
With children*	27	7	35	3	27	4	16	2
With others			11	6	10		16	
Sum	100	100	100	100	100	100	100	100

* including co-habitation partner.

** and possible other persons.

Note: DENMARK 1962 Shanas et al. Table VII-1 our own calculations; 1988 Platz 1989 Table 4.6. Note that 27 per cent and 7 per cent respectively are percentage of sum total of spouse and children and persons living with children and persons in other types of constellations.

FINLAND 1950 Statistics Finland 1953. (For 1990 – see Tables 3 and on 2.3 and 3.1 in Appendix, United Nations 1999. In 1990 most of the “other” category were persons living with spouse and child/ren, a much smaller group were unmarried persons living with child(ren): Table 2.3). 2005 information provided by Ms Ahokas Erja, Statistics Finland.

NORWAY 1953 Ström 1956 (41 per cent with spouse and potential children); 2001 census data provided by Statistics Norway, our own calculations. Information identifies parents with/without children, hence a few of “with spouses only” may coreside with others (good data for 1981 in Guldbrandsen and Ås 1986).

SWEDEN 1954 SOU 1956:1; 2002 Socialstyrelsen 2004b (2 per cent sum total of spouse and potential others and persons in other constellations).

et al. 1968). As we will see below, kin availability also helps to determine patterns of care.

Using available data, an overview of living arrangements among old people in the Nordic countries, except Iceland, is given in Table 5.3. Increasingly, older people in the Nordic countries began to live alone after the 1940s. The pattern of living alone reached high levels by the 1980s in Denmark and Sweden and somewhat later in Finland and Norway, where old people have had a longer history of

living in more complex household constellations. Also noteworthy is the rising proportion that lives with just a spouse. Further, the length of time lived with a spouse is longer than in the past. Local historical studies have illustrated the extremely rapid turnover of farms due to death of the owner well into the 1800s. Now death takes its toll much later in life, although probabilities of divorce among old people have been rising (Table 5.2). Yet, never before have so many people been married so long to the same

Table 5.4 Proportion married older persons, by age, Sweden 1950, 1975 and 2000, and long-lived marriages 1960 and 2000

	65+	65–79	85–94	80+	90+	95+
Age group, percentage married						
1950	46	50	–	20	10	–
1975	50	56	17	25	10	5
2000	51	59	22	31	12	6
Percentage remaining married						
	<i>Marital cohort age</i>			<i>Number</i>		
	50–54	55–59	60–64	50+ years	65+ years	
1960	13.5	5.0	1.2	31 947	197	
2000	23.9	12.6	3.9	121 557	1 606	

Note: These data are not immediately available, as numbers of weddings a given year have to be combined with dissolution of marriage by cause and length of marital union 50–54 years later, etc.

Source: Our own calculations on official statistics.

person, as is evident from statistics for Finland and Sweden. A visible sign of this is the large number of Golden Weddings that nowadays meet readers of the so-called family page of Nordic newspapers. This should not surprise us: marriages dissolved by death on average lasted about 15 years during the 1700s, about 25 years in the early 1900s, 36 in 1952, 42 in 1981 and about 49 years in 2000.

About 14 per cent of Swedish marriages contracted in 1906–1910 were intact 50 years later, compared to 24 per cent of those contracted in 1946–1950. It is indeed possible to find marital unions contracted before the Russian revolution that outlived the Soviet state. Table 5.4 provides more detail on marriages of old people in Sweden. Finland, which was lagging in this regard earlier, has recently caught up due to the rapid increase in longevity of Finnish men. Almost 26 per cent of Finnish marriages contracted 50–54 years earlier were still intact in 2005, as were 12 per cent of those contracted 55–59 years earlier and 3.4 per cent of those contracted 60–64 years earlier (calculated on data provided by Ms. Erja Ahokas, Statistics Finland).

Clearly, over time the proportion of old people who are married has increased and ever more are still married at advanced ages. Most older people who are married (88 per cent) are in their first marriage. By comparison, only 62 per cent of married persons aged 61+ in Norway in 1801 were still in first marriages. Farmers were more often remarried than the landless and remarkably many of the women in the former group were older than their husband (Statistics Norway 1980, Table 14, our own calculations). Due to high rates of remarriage about the same proportion of elderly Norwegians were married in the 1860s as in more recent times. It appears from the Swedish evidence that there are two tendencies: rising longevity bolsters survival of marriages but if those who are widowed or divorced find a new partner, they will usually cohabit rather than remarry. Norms have changed and remarriage is now punished with reduced pension.

As mentioned, many people – young and old – live in relationships outside conventional marriages. Nevertheless, at least up until now, the rising marriage rates of the past imply that an increasing proportion of old people will have off-spring. When the Swedish government in the 1930 and 1935 censuses required

information about child-bearing for all women who were or had been married (information cross-checked by the parish priest against records), it was found that 14 per cent of all marriages were childless and on average married couples had 3.3 children. For marriages that had lasted 25 years or more – which a minority did – only 3 per cent were childless and on average they had 5.1 children. In the early 1950s these cohorts had entered old age and a 1954 survey found that 22 per cent of the Swedish elderly (67+) were childless, 32 per cent had 1–2 children, 22 per cent had 3 or 4 children and 23 per cent had five or more children. The unmarried were more likely than the married to be childless (32 per cent vs. 11 per cent) and women were more likely than men to be childless (25 per cent vs. 19 per cent) (SOU 1956: 1 Table 5.6 p. 257).

In other words, over half of old people from an era without modern birth control techniques were childless or had just one or two children. A similar pattern emerges for Denmark in 1962: 18 per cent was childless, 20 per cent had one child, 20 per cent had two children and a minority (27 per cent) had five or more children. Large families were most common among the oldest of the old and least common among the 65–69 population who were most likely (23 per cent) to have just one child (Shanas et al. 1968, our own calculations from Table VI-14). Comparable later data are scarce but childlessness was about the same among Danish elderly in 1977 (17 per cent) and 1988 (19 per cent), though an increasing proportion had one, two or three children (55 per cent in 1962; 61 per cent in 1988) (Platz 1981, 1989). Childlessness is clearly decreasing among older Danes, as it was only 13 per cent among 60–64 year olds and 10 per cent among 50–54 year olds in 1987 (EGV 1989).

Finland had a somewhat deviant pattern in 1950 compared to other Nordic countries. About the same proportion of old people as in other countries were childless (19 per cent) but a substantial fraction of Finns had many children (29 per cent had 5 or more) and fewer had one (13 per cent) or two (13 per cent) (Statistics Finland 1953: 42). By 1991; however, older Finns (56 year olds) were no longer very distinctive: 17 per cent were childless; 16 per cent had just one child; and 32 per cent had two children. Large families were no longer common by this date, with only 6 per cent reporting that they had ever had five or more

children (our own calculations on Statistics Finland 1992, Table 24a).

For Norway we can draw on data from the OASIS project. In 2000–2001 a fifth of the 75+ were childless but among the “young-elderly” (65–74) about 15 per cent were childless and among the middle-aged (55–64) only 11–13 per cent were childless (Daatland and Herlofson 2004). For Sweden in 1976, 26 per cent of the 65–74 were childless as against 17 per cent of the 45–64 year olds (Statistics Sweden 1980). In 1988–1989, 19 per cent of the 65+ had no children; in 2002–2003 it was down to 15 per cent (Socialstyrelsen 2004b). In other words, the proportion childless among the older population has decreased in the Nordic countries and seems to have leveled off at about 10–15 per cent. It cannot be expected to decrease much further, as a rather high fraction of currently middle-aged persons report that they have never lived in a relationship. For example, 9 per cent of the Danish men and 6 per cent of the Danish women aged 45–49 years in 2002–2003 report this situation (Aeldre Sagen 2004). Similar figures are reported from Swedish fertility surveys of men and women. In a European perspective, childlessness is higher among the 50+ in Germany and Spain (analysis of SHARE). Increasingly, old people in the Nordic countries have children and this is true of an even larger proportion of those in the cohorts that will soon become old. Just having a single child has by no means become more common and may be even less frequent than before.

Kinship Patterns at Large

It is well-known that kinship networks of old people in some ways are more extensive today than in the not-so-distant past. For example, more generations are alive at the same time, a trend that is noticeable among Nordic elderly. Among members of cohorts entering old age in the mid-nineteen hundred, many had lost one or both of their parents quite early in life. That is now a rare situation, though many more in Finland than in Sweden lost their fathers when they were young, reflecting both shorter longevity of Finnish men and the vast losses of men during the war. Another reason for the trend of losing parents later in life is the long trend of earlier age at childbearing. In recent decades childbearing has also been more compressed in the life-course of

the parents. There are also class gradients to family patterns, as workers and farmers tend to lose their parents earlier than middle- and upper-class persons.

In Denmark, 19 per cent of old people belonged to a four-generation constellation in 1962 and 25 per cent in 1977, though the majority are part of three-generation families (EGV 1989). For a chronological perspective we may draw on another source: 74 per cent of the population over age 67 in Denmark had grandchildren in 1962 as against 78 per cent in 1977. The portion that had great grandchildren was, of course, lower but this also increased, from 15 to 21 per cent (Platz 1989). In Sweden in 1994, 65 per cent of old people had grandchildren (Socialstyrelsen 2006). Analysis of data in SHARE indicates that a higher fraction of older (50+) persons in Denmark and Sweden (the two Nordic countries participating in SHARE) have grandchildren than do older people in other European countries. (As discussed below, the proportion that provides care for their grandchildren is quite similar.)

Access to one or more siblings is also more common now than previously. Among those aged 67+ in Denmark, the availability of a sibling rose from 82 per cent in 1962 to 85 per cent in 1977 and the increase in Sweden for the population aged 65+ was from 75 per cent in 1988–89 to 79 per cent in 2002–2003 (Socialstyrelsen 2004a, Table 5.4). The more comprehensive panorama of having both a partner and children seems to have increased as well. In the case of Sweden, the proportion that had both increased from 47 to 51 per cent (same age and years as earlier) and the proportion that had neither decreased from 14 to 9 per cent. Having all near family members (defined as partner, children and siblings) available was stable at 39 per cent of old people. Conversely, a small and shrinking group of old people have none of these family ties. In Sweden in 1988–1989, 4 per cent had no partner, no child and no sibling, as against 3 per cent in 2002–2003. Due to decreased mortality of spouses this is even lower among middle-aged persons. In Denmark about 1 per cent of the 60–64 year age group had none of these family members in 1987 (EGV 1989). In Norway in 1981 this held for 4 per cent, while 35 per cent had all of them (Guldbrandsen and Ås 1986). It should be noted that women and working-class elderly people are at a disadvantage in these respects, primarily because they either lose their partners earlier or have remained unmarried.

Comparable data for the other Nordic countries are unavailable but there are indications of more old people in the past lacking close family. Thus, 14 per cent of elderly Finns in 1950 had neither spouse nor children. In Sweden in 1954 the figure was 17 per cent and in Denmark it was 13 per cent in 1962 and 11 per cent in 1977 (Statistics Finland 1953; SOU 1956: 1, Platz 1981).

Family relations beyond these close ones have been assessed in more global terms in a few studies but it is harder to make comparisons. Thus, in a representative population survey of Swedes 75+ in year 2000, no one reported that they lacked relatives altogether, though the exact meaning of this remains unclear (Socialstyrelsen 2004a).

To these purely demographic aspects of the kinship panorama we may add the geographic availability of kin. This provides a somewhat different picture. Among the 75+ in Sweden in 2000, 25 per cent were married and had children and siblings, though only 5 per cent were married and had at least one child and one sibling living “nearby” (within 15 km); 17 per cent had neither partner, children, siblings or “other kin” living “nearby” and only 3 per cent were married and had representatives of all the three latter relationship types within that close range. Significantly more had both a partner and a child (36 per cent) than had a partner and child living “nearby” (22 per cent) (Socialstyrelsen 2004a).

It is difficult to know whether the patterns described above are typical and stable over time. In Norway in 1953, 5 per cent of old people were unmarried and reported that they had no relatives whatsoever in their municipality, which is often quite a small unit in Norway (Ström 1956). By 1981 this was more common, with 23 per cent reporting that they had neither children nor siblings within that range (Guldbrandsen and Ås 1986). This is possibly comparable with the 35 per cent of Swedes over age 75 who in 2000 did not have either a partner or child within a 15 km distance (Socialstyrelsen 2004a).

Generally speaking, we would expect relatively high local density of kin networks, considering that most people in Sweden, for example, live on or quite near the place where they grew up. Geographical mobility has been remarkably stable since 1749 at about 8 per cent of adult Swedes moving across a parish border annually. Many moves take place inside a parish, as most moves are short distance. Simple cross-tabulations

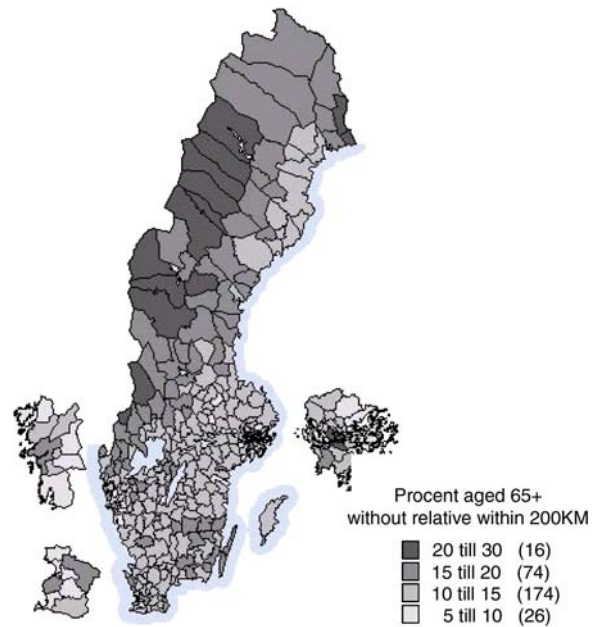


Fig. 5.2 Availability* of close kin (partner and children) for elderly (65+) Swedes in 2004. Per cent

* No partner and no child within 200 km distance. Only “biological” offspring is considered. The fractions in border municipalities are somewhat overestimated as children living in neighboring countries are not registered.

Source : data provided by Gun Alm Stenflo.

also indicate that most adults live in the county where they were born. For example, this was true for 81 per cent of the population living in Scania (Malmö) and 68 per cent of population living in Stockholm County (our own computations on Table 1.3.2 in Statistics Sweden 2006). Nine out of ten geographic moves are related to family (moving out of parents’ household, marrying, etc.); few report moving for reasons related to work. In surveys old people report a low desire to move and this is lower now than it was in the 1950s and 1970s, when a substantial minority wanted to move to get access to modern housing.

Nevertheless, access to close kin does vary locally in at least Norway and Sweden and lack of access has potential consequences for frail older persons. At the most basic level, it is found that living alone varies regionally in these countries (Davey et al. 2006) and this is probably also the case in the other Nordic countries. Swedish data in Fig. 5.2 show the percentage of very old (80+) persons in each of the 290 municipalities that lack a partner (nearly all live alone) and have no child within a 200 km radius. The source of this information is the unique Swedish multigeneration

registry, established in 1947 and covering the whole population. On average 15 per cent of the 80+ has neither a partner nor a child living reasonably near but local variations are big. Much higher rates of isolation occur in many northern municipalities (Alm Stenflo 2006). These variations have obvious implications for the need of public services, as we shall see below.

There is thus, a good deal of geographic proximity between older people and their kin, with important local variations. Nevertheless, many old people have relatively thin family networks around them, although this is less common today than before. A study using data from a Danish town (Odense) in the 1700s found that many of those who attained old age at that time had off-spring but the off-spring were often not available because of sheer distance and/or challenges of traveling the distances involved (Johansen 1987). Similar patterns in Sweden in the 1800s have been described by Gaunt (1983). It is possible that few old people today lack all near family (blood-ties) compared to the number that were identified in studies from the 1950s and 1960s but other types of vulnerabilities are now recognized. In Sweden in 1954, 2 per cent were categorized as “isolated” (SOU 1956: 1) and in Denmark in 1962 “between 2 and 3 per cent” lived in “extreme isolation” (Shanas et al. 1968: 262). The Norwegian survey in 1953 reported that 5 per cent had no contact at all with family, though after considering contacts with friends few were considered to be completely isolated (Ström 1956).

If we restrict attention to children, may be the most significant social tie for old people beyond a partner, it is now well-known that the distance to the closest child is small in most European countries, including the Nordic ones (SHARE 2005). Further, this distance, whether measured in travel time or geographic distance, has not grown substantially over time, judging from Danish and Swedish evidence. Almost all young adults have moved out of their parents’ homes in the Nordic countries but they have not moved far away. Yet, about a tenth of elderly Swedes have their closest child at a considerable distance so that frequent physical contact cannot occur (Socialstyrelsen 2004a) and a quarter of the Danish elderly had their closest child more than thirty minutes travel time away. In Finland in 1976, 76 per cent of older people reported having children “in the same locality” (Karjalainen 1980) and in Norway in 1985, 9 per cent

lived with children and 19 per cent had them in their vicinity (Sundström and Waerness 1987). The European SHARE-project provides more details on geographic proximity and allows comparisons across countries (SHARE 2005).

Taking the perspective of off-spring shows that a sizable minority of adults have their parents living rather far away. For example, in Sweden in 1984, 2 per cent of the 30–49 olds lived with parents but 6 per cent had them in the same house or the immediate neighborhood and overall about 37 per cent had parents within 15 km distance. Another 29 per cent had parents within the 15–150 km radius but almost a fifth (19 per cent) had them more than 150 km away (13 per cent lacked parents) (after Sundström 1985).

A question on frequency of contacts with relatives is a staple in surveys of old people. Results from these surveys make it obvious that interaction with kin remains high for older people, although more of the social life took place inside their households in the past, when coresidence with children and others was more common. Suggestive of changes in recent decades, coresidence declined in Denmark between 1962 and 1975 but during this same time temporary stays in each other’s homes increased vastly (Platz 1981). There is regrettably no more recent information on this topic, except that studies of vacation patterns find visits to relatives to be one of the most common “tourist” activities.

Dwellings are now so uniformly adequate that surveys of old people no longer tend to ask about their housing standards but rather explore whether they use cell phones and computers – 4 per cent of the Swedes 75+ were surfing the internet at least weekly in year 2000 (Socialstyrelsen 2000). Very few old persons want to move to institutional care in the Nordic countries but there is widespread interest in retirement communities and this interest appears to be increasing, according to a Norwegian study (Brevik and Schmidt 2006).

To some extent geographic and social mobility go together, resulting in greater distances between old people and their off-spring. When the children are upwardly mobile, the frequency of physical contact between generations declines. Observing this finding may lead to a premature conclusion about old parents being neglected by children who have “arrived”. However, when the distance factor is accounted for, variations in social contact between generations of

different social status vanish – social and geographic mobility simply go together (Sundström 1986). Nevertheless, a qualitative study found that “careerists” tended to provide less care to ailing parents living in the vicinity (Winqvist 1999). From a demographic perspective it emerges that middle-class adults more often have aging parents still alive, though these parents seem to be healthier and in less need of help than parents of working-class adults. The lower frequency of surviving balances the poorer health of aging working class individuals, resulting in caregiving for parents occurring about equally often in all social classes (Socialstyrelsen 2004a, 2006). It may also be noted that in spite of substantial social mobility in the earlier half of the 1900s in the Nordic countries, older parents are still likely to have off-spring in the same social stratum.

It is interesting that there are substantial local variations in public services (home help) for the elderly in all Nordic countries. Attempts to explain these persistent patterns with supply factors like economics, politics and simple demographics have been futile but recent analyses for Sweden that included indicators of need (demand) have met with greater success. When differences in need (living alone and in need of care) are considered, variations in service coverage vanish (Davey et al. 2006).

The Arithmetic of Kinship

Many scholarly studies of needs for care of the elderly have examined the capacity of their social network to provide care and then tried to estimate potential changes. In a seminal work in 1976, Moroney introduced the use of an indicator for the demographical size of the “care-taker pool”. This indicator typically relates the number of persons (women) in the population of presumable caregiving age – often 45–59 – to the number of old people. Whatever the definition, this ratio shows a clear and rather dramatic decline over time and the change is most visible in the later 1900s. In 1900 there were 858 Swedish women aged 45–59 per 1000 old persons (and many more in 1750), in 1960 the ratio was still 848 but by 1975 it had declined to 591. In 2000 the ratio was 586 (the stability after 1975 was due to the baby-boom cohort in the numerator) but projections show that it will fall to be about 480 in 2025. Using single or nonemployed women

as the numerator shows an even more drastic shrinking of the “care-taker pool” (Sundström 1983).

Easily calculable as it is, this indicator of (potential) access to informal care has serious limitations in describing the access of older people to potential caregivers. For example, this declining ratio also suggests a waning supply of potential professional caregivers in that age group. In 1935 there were 250,000 recorded maid-servants in the Swedish census, in 1945 there were half that number (120,000). This decline was probably more due to new avenues for female workers opening up during and after the war than to demographic changes, such as a shrinking pool of young, unmarried women from which maid-servants were mainly recruited. An unknown number of maids worked for elderly people, though we know that 3 per cent of the elderly had a maid-servant in 1954 (ca. 20,000). By then, the frequency of having a maid was already severely eroded.

A more crucial question for interpreting changes in the care-taker pool index is whether they mirror real changes in access to close relatives in families (assuming that close relatives will usually be providing the core part of informal care). The preceding section about increasing access to immediate family raises serious doubts about the usefulness of any arithmetical indicator. To this may be added the observation that being married and/or employed seems – at least in the Nordic countries – to be less of a hindrance to caregiving than is often assumed (below). Empirical studies in the Nordic countries find that carers have often terminated their work or are working part-time for other reasons when they become carers for an ailing parent or someone else (Socialstyrelsen 2006).

Even with the reservations noted above, it may be argued that the care-taker pool concept is a useful heuristic to indicate the degree of pressure on the family. This approach makes more sense but is still problematic because it uses a somewhat mechanistic view of the family. An increased risk of becoming a carer seems to have occurred in the final years of the 1900s, at least in Sweden (Olsson, Svedberg and Jeppsson Grassman 2005, Socialstyrelsen 2006). But is it reasonable to equate the increased risk for individual family members to help an aging parent over one’s life-course with an abstract “family” that is “squeezed”? All available studies of family care for the Nordic elderly and public services for old people

in need of care find an interaction between these two providers. There seems to be flexibility on the part of individual families in dealing with these challenges, less flexibility in the public systems but also important synergisms between them (below).

Interaction Between Generations: The Contents of Exchange and Old Persons as Caregivers

Less is known about the contents of interaction across Nordic generations than about the frequency of contacts and distances but in general terms it can be stated that old people in the 1950s were mainly receivers of housing, help and financial support. Today the old are often givers of informal care and financial transfers. The earlier pattern of the old as receivers of help is quite visible from a Finnish survey conducted in 1950, where a majority received various types of help from family members. Perhaps, this finding is not surprising in a situation where there was widespread poverty, no universal pension system and a serious housing shortage. Nearly half a million Finns were evacuated in 1944–1945 from Karelia when it was lost to the Soviet Union. Eight out of ten old Finns who had off-spring were helped by them and most said that they could not get more help than they already received. At that time the majority affirmed that support for aging parents was the responsibility of off-spring rather than of the state (Statistics Finland 1953). Filial obligation of children and grandchildren was still required in Finland at that time. In Sweden this obligation was abolished with the poor-law itself in 1956 and somewhat later it was abolished in Finland and Norway and finally in Iceland (1991). Denmark never had this legal statute, either in civil law or in the poor law and the absence of such a law seems to have had no noticeable effect on family relations.

A Swedish survey in the early 1950s and a Danish study in 1962 found that some old people were givers of help and money, rather than receivers (Elmér 1960, Shanäs et al. 1968). Two per cent of the Swedish elderly in 1954 were “substantial” givers of help to somebody in another household (SOU 1956:1), in 2002–2003 about 5 per cent were givers of extensive informal care outside their own household and another

17 per cent were givers of less extensive help. Another 5 per cent gave mostly intensive help inside their household, typically to a partner (an equal number of men and women provided this care) (Socialstyrelsen 2006). In 1999–2000, 6 per cent of old Finns reported that they had in the last four weeks given care to a “sick or elderly” person in another household (it was 10 per cent for the population aged 50+) (personal communication from Laura Iisakka Statistics Finland).

In 1962, 29 per cent of old Danes gave some kind of help to children and 14 per cent gave help to grandchildren; by 1977 the percentages had risen to 49 and 52, respectively (Platz 1981). Only a minor fraction of this increase is attributable to more old people having these ties (discussed above). Few old Finns in the 1950 survey reported that they “had to” take care of grandchildren but a 1999–2000 time-use study found that 19 per cent reported having been child-minders within the last four weeks (it was 23 per cent among the population aged 50+) (Laura Iisakka as above). In 1980, 50 per cent of Swedes aged 55–64 reported “regularly” doing child-minding (SOU 1981: 70). Even higher figures were reported at that time from Finland and Norway for giving temporary help and it appears that this has become even more common since then. This is supported by more recent data in the SHARE survey that indicate that caring for grandchildren is no more common among the population aged 50+ in Southern Europe than in Denmark and Sweden. In Finnish retrospective data, few persons born 1915–1930 reported having been taken care of by grandparents in their childhood (5 per cent in their own home, 2 per cent in another household). It was much more common to have been cared for by siblings, other relatives or a hired child-minder. The same pattern emerged from similar data collected in Norway (Sundström and Waerness 1987).

In both Finland and Norway, having been taken care of by grandparents became more common among cohorts born after 1940. Noteworthy is the significant number of hired helpers who provided care for those in the earlier cohorts; in the Finnish data 75 per cent report having at some point in time a professional maidservant in their home when they were children (op.cit.). There has therefore not been a simple transition from use of informal care to formal care, whether care is for old people or children. Nor does frequent childcare by grandparents for grandchildren necessarily imply that they occupy an unambiguous position in the family network. A qualitative Finnish study of

Table 5.5 Caregiving among the 55+ living in the community, by age, Sweden 2002–03. Per cent

Helps old/sick/handicapped person*	Age group				
	55–64	65–74	75+	65+	55+
In own household	3	4	5	4	4
In other person's household	26	21	11	16	21
Total	29	25	16	22	25
Population, 1000s	1113	734	711	1445	2558

Source: ULF 2002–03, our own computations.

* “Do you regularly help some person who is old, sick or handicapped and who either lives here or somewhere else?”

mother-daughter-grandchild ties indicates a certain rolelessness for the grandmothers and a degree of ambivalence between the adult generations (Hurme 1988).

A common stereotype holds that the contemporary family is “typically” burdened by care for both small children and aging parents. This is rarely the case but data in SHARE for European countries including Denmark and Sweden support a looser version of this scenario. The population over age 50 does have a pivotal role for exchanges in both directions in these family constellations (Attias-Donfut et al. 2005). Danish studies in 1987, 1997 and 2002 assessed exchanges from the perspective of middle-aged individuals and report that the volume of socializing, vacationing, caring for grandchildren and maintaining of housing was simply massive but the amount of financial help was marginal (EGV 1989, Aeldre Sagen 2004). The large majority expected to get help from their children, should needs for that arise and most reported that they were prepared to help their parents if needed in the future. Asked about values in life, the family and what it stands for emerged as paramount in importance (Aeldre Sagen 2004). It has been suggested that when resources were directed to old people by the welfare state, it made it possible for aging parents to be givers of support to children in general and not just to adult children in trouble as we have seen above (Sundström 1983, 1987).

Community living old persons are often givers of care to others. Indeed, now the old as often give help (22 per cent) as they receive care (21 per cent, Socialstyrelsen 2006). Data in Table 5.5 provide more detail about patterns of care-giving by the population over age 55 in Sweden. Data from SHARE for the population aged 50+ show quite similar patterns of care-giving for Danes as for Swedes (Socialstyrelsen 2006).

In Sweden and the other Nordic countries (as elsewhere) care-giving typically climaxes around age 45–54, after that the prevalence of care for parents and other family members declines, though caring for a partner remains high and even increases after that age. Most of the caring is infrequent, although 5 per cent provide care on a daily basis (equally common for men and women). Daily care is usually for a partner or, less often, some other close family member and usually the care is provided in one's own household (Socialstyrelsen 2006).

The intermittent nature of most caregiving implies that many or maybe even most people will eventually become caregivers, depending on how strict our definition of care is. In a national survey in year 2000, 34 per cent of the population over age 75 living in the community reported one or more incidents of caregiving during their life (41 per cent of the women and 24 per cent of the men, Socialstyrelsen 2006). The recipients were almost all a parent or a partner or other close family member. There is no evidence of decreasing caregiving over time (Lingsom 1997) and, as mentioned above, some recent data indicate *increased* levels of informal caregiving. The increase especially occurred for daughters and other female kin during the 1990s, an era of cutbacks in social services for old people in Sweden (Sundström et al. 2002; Olsson et al. 2005).

The Use of Public Services and Patterns of Care

Historically, old people who used poor relief and, later, public services often lacked functional family members and/or lived alone and were poor. To some extent this is still true in the Nordic countries, particularly for the use of institutional care. For example, the never-married (and consequently often childless) are still over-

Table 5.6 Longitudinal patterns of institutionalization of old people in Dalby, Sweden, 1969–1995. Percentage institutionalized before death

	All	Workers	Mdl Class	Single*	Married**	Single worker	Married worker	Single Mdl Class	Married Mdl Class
Men	20	27	14	(40)	16	(40)	23	(40)	10
Women	48	58	32	(58)	45	(70)	53	(0)	35
Total	32	41	20	(48)	28	(55)	37	(29)	19
N men	89	45	44	15	74	10	35	5	39
women	65	40	25	12	53	10	30	2	23
N total	154	85	69	27	127	20	65	7	62

* Never-married.

** Ever-married, incl. widowed and divorced persons and co-habitation units (3 per cent).

Source: computations on the Dalby-study. Subjects were all aged 67 when the study began.

represented in places providing institutional care. In the Nordic countries institutionalization rates were somewhat higher than in most other Western countries. About 5–6 per cent of the elderly in the 1950s were institutionalized and this per cent increased for a couple of decades, before more recently retreating back to about 6 per cent in 2006. Rates at this level were not unusual in earlier centuries but could vary a good deal locally (Sundström 1995). Swedish regions with many large estates and proletarianized farm-workers had more poor-houses to accommodate the old who needed care. Yet, averages provide an incomplete image of institutionalization because the long-run cumulative risk of institutionalization has varied across locations and has shifted across time. In 1950 about 15 per cent of old Swedes sooner or later experienced institutionalization; in the 1970s it was about 30 per cent; and today the per cent is most likely higher as the duration of institutionalization has declined (Gaunt 1987; Sundström 1995).

Institutions refer to permanent residences for old people, thus excluding acute health-care settings. An alternative to institutionalization is the home help services that expanded rapidly in the 1960s. These services had and have a much less visible class bias. The working class in old age use home help services more often than middle- and upper-class elderly but a Norwegian study (by Kari Waerness; unpublished) and Swedish analyses indicate that this is mostly due to class differences in functional capacity and living arrangements. It was also found that persons who used home help were often helped by their family as well and vice versa (Socialstyrelsen 2000, 2006). These patterns will be dealt with in more detail below.

It seems that class gradients may have become attenuated, with public services focusing on the oldest and frailest, who often suffer from dementia. The Nordic elderly now manage longer at home, thanks to the combination

of better housing, informal care provided by family and others and the public home help services. In particular, as we have seen, old people stay married longer and marriage protects against institutionalization and use of other services: few husbands or wives send their partners to institutional care. Although marital status goes a long way toward explaining risks of institutionalization, we usually have access only to “snapshots” of marital status for institutionalized persons. It is rare to find data on the trajectories from onset of retirement until the end of life that describe the sequence of geographical moves and institutionalization. However, a few studies that capture these aspects longitudinally have been done. In a French longitudinal study starting with Parisian retirees around age 70, a quarter was finally institutionalized (Cribier et al. 1999). In a Norwegian study of people over age 80, well over half of the subjects ended their lives in institutional care (Romören 2003).

Swedish data indicate that men and women are equally likely to provide care for their partners in old age. This is seemingly inconsistent with the fact that two out of three elderly marriages end with the husband’s death. Yet, because men often experience more “abrupt” deaths and shorter and less severe spells of frailty, the total volume of care provided by men and women comes out to be about the same (Socialstyrelsen 2004a).

Longitudinal data from age 67 (retirement age in 1969–1970) for a Swedish locality are used in Table 5.6 to analyze how gender, marital status and social class interact with risks of institutionalization. In this study, 32 per cent ended their life in an institution but working class elderly ran a greater risk of ending their lives there. The social differences that show higher risk of institutionalization among married working class elderly than in the middle class probably mirrors better health in middle class. A British study found that partner care was more common

Table 5.7 Longitudinal patterns of institutionalization of old people in Larvik, Norway, 1981–2000. Percentage institutionalized before death¹

	All	Workers	Mdl Class	Single ²	Married	Single worker	Married ³ worker	Single Mdl Class	Married Mdl Class
Men	52	49	60	(50)	53	(40)	50	(67)	59
Women	73	73	75	75	72	(64)	74	78	73
Total	67	65	71	72	66	(58)	66	77	69
N men	124	75	47	8	116	5	70	3	44
N women	309	151	142	60	249	14	137	45	97
N total	433	226	189	68	365	19	207	48	141

¹The study followed all 434 persons in the municipality who were 80+ in 1981 until they were all dead. (See Romören 2003 for details.)

²Never-married.

³Ever-married, incl. widowed and divorced persons and co-habitation units.

Source: Computations on Larvik-data by Tor Inge Romören.

in working-class elder-marriages for that very reason (Glaser and Grundy 2002).

Married middle class men ran a 10 per cent risk of eventually being institutionalized; working class spinsters had a 70 per cent risk. Indeed, using class, marital status and gender at age 40, one can predict the risk of institutionalization in later life (analysis not shown here). Noteworthy is the rather high risk for the single elderly. In the Finnish census in 1990, 9 per cent of single old women and 11 per cent of single men were institutionalized and many were at relatively young ages (UN 1999 Table 3.1 in Appendix, our calculations). Analysis of an urban sample of 70 year olds followed from 1971 (the H70 in Gothenburg) found that 50 per cent of them ended their life in an institution, with risk gradients about the same as those shown

in Table 5.6 for Dalby residents (personal communication from Marie Ernsth Bravell).

The rather dramatic risk differences shown in Table 5.6 may be a thing of the past. The risk of institutionalization used to be primarily a matter of demography and social class rather than a matter of health. The age of entry into institutions is now higher on average and placements are rationed to provide for very old, frail and demented persons. Also, housing of old people is much improved and community services are now more extensive and better targeted. And, as we have seen, more of the elderly are now married into late life. We therefore expect differences by demographic characteristics to be smaller if we analyze the trajectories of very old persons more recently, as in Table 5.7. Compared to those in Table 5.6, those in

Table 5.8 Older people aged 65 or more years living in the community, by family situation, need for help and help sources, Sweden 2002–2003. Per cent

	Married/co-habiting ¹		Lives alone		All
	Has child	No child	Has child	No child	
	<i>Percentages</i>				
Needs help²	16	20	27	25	21
Sources of help					
Family only ³	80	69	42	24	58
Home-help only	5	8	18	47	15
Both	14	18	32	20	23
Neither ⁴	2	5	7	9	5
Sum	100	100	100	100	100
Sample sizes	(1,711)	(194)	(1,078)	(277)	(3,260)

Notes: ¹ About 97 per cent lived with spouse only but including those also living with children, siblings and others.

² Needs help with one or more ADLs: help received refers to the same ADLs.

³ Or other informal care.

⁴ But may have had other sources of support

Source: Statistics Sweden ULF 2002–2003, our own computations.

Table 5.9 Support patterns for old Swedes in need of help*, by family situation and help constellations, 2000, 75+. Per cent

	Has spouse/partner		No spouse/partner	
	Has offspr. (N=313)	No offspr. (N=37)	Has offspr. (N=320)	No offspr. (N=100)
TOTAL				
Per cent women	22	24	66	69
Help given only by				
Spouse/partner	70	70	–	–
Child(ren)**	3	3	30	–
Other kin	–	3	4	13
Other household member	–	–	2	–
Friend/neighbor	1	3	6	14
Home help	5	3	21	34
Combinations of				
Spouse+child**	6	–	–	–
Spouse+Home help	5	11	–	–
Spouse+other(s)	1	5	–	–
Child+Home help**	1	–	19	–
Child+other(s)**	1	–	4	–
Home help+ other(s)	–	–	3	19
No one	6	5	12	19
Total	100	100	100	100

*Need help with one or more ADL-tasks.

**Children include potential inlaws.

Source: our own computations on HPAD survey 2000 (Socialstyrelsen 2000).

Table 5.7 are frailer and their illnesses are more severe and debilitating and of longer duration, especially for the women (Romören 2003).

The analogous analysis in Table 5.7 for persons over age 80 confirms that their greater frailty and higher rates of solitary living tend to equalize social differences and gender distinctions. In the Norwegian Larvik study the final rate of institutionalization was twice as high as in the Swedish Dalby study that started with 67 year olds (Table 5.6), both overall and for the various sub-groups. Social differences have shrunk, as have gender variations and the significance of marital status. It might be noted that both studies took place in municipalities with abundant supply of institutional care, fairly typical of the era being studied.

A high longitudinal risk does not necessarily imply high prevalence rates. Indeed, the little evidence there is on these aspects in the Nordic countries indicates rising lifetime risks of using public services before death, while cross-sectional user data for the same time indicate declining rates of use. The explanation seems to be that use of these services is for a much shorter period of time than before. It is noteworthy that most old people will have used public home help before they move to an institution or before they die in the community.

Care by Kin and State and its Demographic Determinants

Everything else equal, we may expect that family ties in general and informal care in particular, are at least partly determined by the sheer size of the family. This recognizes that “access” to a partner and off-spring is essential for these relationships to exist. Of course, being in a network means not only that one may receive help but also that one may have to provide it. If networks expand or contract, one might find a corresponding change in the risks of receiving or giving help. These dynamic aspects of kin networks are hard to assess but some evidence on the effects of network character and size can be deduced from survey data. There is a clear social profile related to the pattern of help old people receive when they live alone in the community and need help, as shown for Sweden with the two different data sets used in Tables 5.8 and 5.9.

In Table 5.8 we highlight the division of labor between family and state; in Table 5.9 we take a closer look at who the helpers are. It emerges from Table 5.8 that most old people who need help and are

married and have children rely on family only (80 per cent). In contrast, about half (47 per cent) of those who lack both of these cardinal relations rely exclusively on the state.

The two above findings are not surprising but one also sees that old people who live alone and who have off-spring often use public home help. However, these old people rarely use home help only – the typical situation for them is to be helped by family alone (42 per cent) or to have a combination of family support and public help (32 per cent). As mentioned, adult children of old people often live in the vicinity of their parent and it is within this group that we have seen the greatest increase in family care in the 1990s, paralleling a cutback in public home help (Sundström, Johansson and Hassing 2002).

The “access” to a partner and/or child and its consequence for who the carers are can be gleaned in some detail from Table 5.8, which describes various combinations of informal and formal (public home help) care in Sweden for older people in need of help. It verifies that public services (home help) are used mostly by older persons lacking close family members. From Table 5.9 we gain insights into patterns of who in the family is relied upon for care.

Those who have a partner most often rely upon that partner for help; other evidence indicates that when “outside help” is used, it is primarily when the partner is also frail or otherwise not able to give the support needed (regardless of whether they have off-spring or not). Also, when public help is given to these persons, relatively few hours of help are granted. Partnered persons who do not have children use home help somewhat more often than those who have a child available. As mentioned above, geographic proximity of off-spring also reduces use of public support in old age.

For unpartnered older persons, having a child makes a big difference. Unmarried persons with children tend to receive help from them, alone or in combination with home help, although 21 per cent are helped by public services alone. Those who are in the category that has neither partner nor children are most likely to make use of help from more distant kin, neighbors, or others. They are also the most likely to rely on the public home help (53 per cent) but even among them a minority is dependent solely on the public service (34 per cent).

Access to kin, which includes both the character of the relation and the sheer number of kin, clearly influences both the chance to receive and to give care. In recent (2002–2003) Swedish national data, 45 per cent of the people aged 55+ who had a partner, parent(s) and siblings(s) were care-givers (caring for a person, regardless of relation and location). In contrast, 24 per cent of those who had two of these were caregivers; 20 per cent of those with one were caregivers; and 16 per cent for those who lack all these near relations were caregivers. Of course, the relationship making the biggest difference in whether one was a care-giver was presence of a parent. It is uncommon to have all three relationships (12 per cent) or no relationships (8 per cent); most have two of these relations (47 per cent) or just one of them (33 per cent). Clearly, there is a good deal of care being exchanged inside the family but there is also substantial care being given to more distant kin and to non-kin (Socialstyrelsen 2006).

Aging in the Nordic Countries: Financial, Attitudinal and Political Aspects

As early as 1912 a Swedish government commission on pensions pointed to the significant implications of supposedly weakened informal care for public spending. This concern has remained an ingredient of most Nordic white books on pensions and old-age care. Even if no assumption of a decrease in informal care is made, the availability of family care is considered important – the latest examples being econometric analyzes of consequences of increased needs for old-age care in Norway by 2050 (Statistics Norway 2006) and a similar Swedish analysis with a rather “optimistic” perspective on future needs for care (Lagergren and Batljan 2000). In contrast to at least one official European Community document (Council of Europe 1998), official Nordic publications have not proposed that families should shoulder bigger commitments in old-age care.

One reason for Nordic reservation in promoting increased family care is the official wish to keep labor force participation high. Further, there is a gender aspect to family care because provision of informal care is seen as a mostly female undertaking and it is often assumed that it is hard for women to combine caregiving with

paid work. Yet, it is estimated that “only” two-thirds of the care is provided by women (Szebehely 2005) and analyzes of both cross-sectional and longitudinal data fail to find any major effects of informal caregiving on gainful employment of either men or women (Socialstyrelsen 2006). Indeed, an analysis during the 1990s, when there was shrinking public services for old people and a simultaneous increase in informal care, found consistently high rates of female labor force participation. The increase in care, it should be noted, nearly all fell on daughters and other female family members (Sundström, Johansson and Hassing 2002).

Likewise, it is difficult to find a link between high coresidence between old people and their children (presumably implying more informal caregiving) and high labor force participation rates. In Finland there is high labor force participation in full-time jobs for both men and women who coreside with parents but in Norway there are low rates for women. In Denmark and Sweden, which have high employment rates, many women are in part-time jobs but it is seldom suggested that the reason for this is related to any need to provide care to aging family members (Socialstyrelsen 2006).

Interestingly, these patterns contrast with what is observed in Southern Europe using the SHARE database, where many carers of old family members report that they have had to refrain from working, stop working, or reduce hours of working. A plausible explanation for these divergent patterns is the access to relatively abundant and affordable public services for elderly people in the Nordic countries, both in the community and in institutional care. Availability of public support is also what carers asked for in a large representative Spanish study of carers in 2004 (IMSERSO 2005). Similar results have been found in international comparative studies like the OASIS project covering Norway, Germany, Britain, Spain and Israel (Daatland and Herlofson 2004, Daatland and Lowenstein 2005).

Families and caregivers do not often ask for the state to “take over” altogether but rather express a desire for shared commitment, where both parties contribute to the care (Socialstyrelsen 2004a). This outcome is quite often the case in care for old people in the Nordic countries, both in the short and the long run. Combined care occurs much more often in Nordic countries than in, for example, Spain (Sundström et al. 2006).

Discussion

There have been sizable variations across time in household structures of old people in the Nordic countries, with extended family households persisting longer in Finland and Norway than in Denmark and Sweden. But over the 1900s household structures in all of these countries began to converge as three types became dominant: living with just a spouse, living alone, or living in an institution. Increasingly, the last option is becoming more common near the end of life, often after a succession through the other two types. Nevertheless, cross-sectional institutionalization rates have remained low and even decreased.

The welfare programs of the Nordic countries have enabled old parents to remain independent thanks to relatively generous pension systems, access to good housing and affordable services and health care. This has been a gradual process based on a centuries-old tradition of poor relief as a local, collective responsibility that is financed locally and handled systematically as a common decision process. Indeed, parish and later municipal democracy was for generations much better developed than was participation in any national political forum.

Systematic poor relief in all the Nordic countries, a comparatively transparent organization to provide for the sick, poor and elderly, was gradually transformed into the contemporary welfare system. The modern system has retained some of the important characteristics of its predecessors, although it now serves the whole population, not only poor citizens who cannot get the help they need from family members. It has also demonstrated a remarkable resilience in accommodating demographic challenges, primarily the growing number of old people considered needy of services.

Considering the high proportion of old people in the populations of the Nordic countries and the prospects of even higher proportions of the old and very old in the near future, the public debate of aging issues has been remarkably tranquil. Government commissions on pensions and old-age care are launched with rather short intervals in the Nordic countries and these issues are highly political. Yet, public welfare is also anchored in centuries’ old structures and there is relatively high confidence – although eroding in recent years – in the state’s capacity to handle future demographic challenges. Importantly, the cleavage between

old people as a group and the rest of the population in the Nordic countries appears to be smaller than in continental Europe. The 1992 Eurobarometer study found that most old people in Denmark and Sweden felt that they are treated neither especially well nor especially poorly because of their age by such institutions as government agencies, the health care system, the post office, the media, or even their family. On the continent many old people reported that they received better treatment due to their old age but just as many felt that they were treated much worse (SOU 1993: 111).

Official studies in the Nordic countries tend to take a concerned but relatively optimistic view of the future chances to meet the needs of old people, at least if there is sustained economic growth and manpower available (Lagergren and Batljan 2000). Expectations are that the state will carry responsibility for old-age care in the future, although opinion polls indicate growing doubt as to the state's ability to provide pensions and services (Socialstyrelsen 2004a). When unforeseen low economic growth threatened to make the old pension system actuarially unsound, a reform of the pension system was undertaken in the 1990s. This change met with surprisingly little popular resistance, even though many more years now are needed to qualify for a full pension. The pension outcome is now tied to national economic progress and resulting pensions in the future may be lower than previous cohorts received from a very generous system. Legal retirement age is now 67 (having been raised from 65 to 67 in Sweden) and actual employment rates are also comparatively high up until age 60–65 in the Nordic countries.

Contemporary discontent with public services for old people is often rooted in the feeling that one does not get the support that was once available. The threshold to qualify for home help or institutional care is higher now than before, creating a general feeling that there is less for everybody. A redefinition of needs has successively taken place in Nordic municipalities, which used to have a near monopoly on services for the elderly. Paradoxically, the rationing that is taking place has been successful in the sense that now more old people than before eventually get their share of public welfare, although it occurs later in the life course and provides a little less than earlier for the same need (Socialstyrelsen 2000). This change is not well understood by social service administrators

themselves and it is even more difficult to communicate to the public. Nordic people used to be relatively willing tax payers, responding to the feeling that they all got their share of what was produced with their tax money. This sentiment is slowly being undermined by well-publicized incidents of needy old people confronting raised thresholds of eligibility. In addition, there is a creeping privatization, in the shape of expanding family support and commercial alternatives to public services.

Concepts

old = 65+ if not otherwise stated

single = never-married

unmarried = not married

Acknowledgement I want to thank several persons at statistical central bureaus in the Nordic countries, among them Erja Ahokas and Laura Iisakka at Statistics Finland. Laura obligingly did special tabulations for this study. Gun Alm-Stenflo, formerly at Statistics Sweden and now at Statisticon AB in Uppsala has kindly provided information and Fig. 5.1 and 5.2. Tor Inge Romøren at NOVA in Oslo generously did extensive work for Table 5.7.

We have used data from the early release 1 of SHARE 2004. This release is preliminary and may contain errors that will be corrected in later releases. The SHARE data collection has been primarily funded by the European Commission through the 5th framework programme (project QLK6-CT-2001-00360 in the thematic programme Quality of Life). Additional funding came from the US National Institute on Aging (U01 AG09740-13S2, P01 AG005842, P01 AG08291, P30 AG12815, Y1-AG-4553-01 and OGHA 04-064). Data collection in Austria (through the Austrian Science Fund, FWF), Belgium (through the Belgian Science Policy Office) and Switzerland (through BBW/OFES/UFES) was nationally funded. The SHARE data set is introduced in Börsch-Supan et al (2005); methodological details are contained in Börsch-Supan and Jürges (2005). /see www.share-project.org/

References

- Aeldre S (2004) Sociale netvaerk. (Social networks). Copenhagen: Aeldre Sagen. Fremtidsstudien Report No. 4 (auth. G. W. Leeson)
- Alm Stenflo G (1989) Parity-dependent fertility in a population with natural fertility in Northern Sweden 1720–1900. *J Fam Hist* 14(3):211–227
- Alm Stenflo G (2006) Äldres omsorgsbehov och närhet till anhöriga. (Needs of care of old people and their distance to kin) Statistics Sweden: Demografiska Rapporter 2006:1

- Ås, Dagfinn (1989) Households, family nucleus and dwelling size in Norway 1967–1987. Paper presented at the International Housing Symposium on the Meaning and Use of Home and Neighbourhood. Gävle, Sweden, Aug. 21–23
- Atias-Donfut C, Ogg J, Wolff F-C (2005) European patterns of intergenerational financial and time transfers. *Eur J Ageing* 2(3):161–173
- Brevik I, Schmidt L (2006) Slik vil eldre bo. (That's how old people want to live) Oslo: Norsk institutt for by- og regionforskning, NIBR-Rapport 2005:17
- Byggeforskningsrådet (1979) Jordbrukarbostaden 1945–1977. (The farmer's dwelling 1945–1977). Rapport T17:1979
- Council of Europe (1998) Elderly people within their family – legal and social responsibilities. Questionnaire for Research Programme, Coord/Elderly (98) 3 Def
- Cribier F, Duffau M-L, Kych A (1999) Parcours résidentiels de fin de vie d'une cohorte de retraités de la région parisienne, Rapport de recherche de la MIRE, Ministère de l'emploi et de la solidarité, Paris, janvier, 40 p., Note de synthèse, Cahiers de Recherche de la MIRE, no 5, mai, pp 7–11.
- Daatland SO, Herlofson K (2004) Familie, velferdsstat og aldring. Familiesolidaritet i et europeisk perspektiv. (Family, welfare state and ageing. Family solidarity in a European perspective.) Rapport 7/04. NOVA, Oslo
- Daatland SO, Lowenstein A (2005) Intergenerational solidarity and the family-welfare state balance. *Eur J Gerontol* 2(3):174–182
- Davey A, Johansson L, Malmberg B, Sundström G (2006) Unequal but equitable: An analysis of variations in old-age care in Sweden. *Eur J Ageing* 3(1):34–40
- EGV (1989) Befolkningen. (The Population.) Copenhagen: EGV-Fondens Fremtidsstudie. (auth. G. Leeson, H. Spöhr and P.C. Matthiessen)
- Egerbladh I (1989) From complex to simple family households: Peasant households in northern coastal Sweden 1700–1900. *J Fam Hist* 14(3):241–264
- Elmér Å (1960) Folkpensioneringen i Sverige. (Old-age pensions in Sweden) Lund: Gleerups. Diss
- Gaunt D (1983) The property and kin relationships of retired farmers in northern and central Europe. In: Wall EdR, Laslett P (eds) *Family forms in historic Europe*, Cambridge University Press, Cambridge
- Gaunt D (1987) Rural household organization and inheritance in northern Europe. In: Hareven T, Plakans A (eds) *Family history at the crossroads*. Princeton University Press, Princeton
- Glaser K, Grundy E (2002) Class, caring and disability: Evidence from the British retirement survey. *Ageing Soc* 22(3):325–342
- Guldbrandsen O, Ås D (1986) Husholdninger i 80-årene. (Households in the 1980s). Oslo: Norges Byggeforskningsinstitutt, Prosjektrapport 18
- Hamrin E (1954) Bostadsvaneundersökning. Bostadsvanor och möblering. (Study of use of dwellings and their furnishing). Lund: Statens forskningsanstalt för lantmannabyggnader. Meddelande Nr 32
- Hurme H (1988) Child, mother and grandmother. Intergenerational interaction in Finnish families. *Jyväskylä Stud Edu, Psychol Social Res* 64
- IMSERSO (2005) Cuidados a las Personas Mayores en los Hogares Espanoles. El entorno familiar. Ministerio de Trabajo y Asuntos Sociales, Madrid
- Johansen H-C (1987) Growing old in an urban environment. *Contin Chang* 2(2):297–305
- Karjalainen P (1980) Vanhusten kontaktit, avuntarje ja palvelujen vuonna 1976. (Contacts, need for help and access to service of the aged in 1976). Statistics Finland: Special Social Studies, Series XXXII No. 62
- Kjellman G (1984) Kultur och åldrande. (Culture and ageing) Äldre i samhället – förr, nu och i framtiden. Uppsala universitet, Sociologiska institutionen. Arbetsrapport 17
- Lagergren M, Batljan I (2000) Kommer det att finnas en hjälpare hand? (Will there be a helping hand?) Bilaga 8 till långtidsutredningen, 1999/2000. Finansdepartementet, Stockholm
- Lingsom S (1997) The substitution issue. NOVA, Rapport 6/97, Oslo
- Moring B (2003) Nordic family patterns and the north-west European household system. *Contin Chang* 18(1):77–109
- Moroney RM (1976) The family and the state. Longmans, London
- Olsson L-E, Svedberg L, Jeppsson Grassman E (2005) Medborgarnas insatser och engagemang i civilsamhället – några grundläggande uppgifter från en ny befolkningsstudie. (Civic participation and involvement – some basic data from a new population study) Report to the Ministry of Justice (www.sverige.se)
- Platz M (1981) De aeldres levevilkår (1977) (Living conditions of old people in 1977). Copenhagen: Socialforskningsinstituttet. Meddelelse 32
- Platz M (1989) Gamle i eget hjem. Bind 1: Levekår. (Old people in the community. vol 1: Living conditions). Copenhagen: Socialforskningsinstituttet. Rapport 89:12
- Romören TI (2003) Last years of long lives. The Larvik study. Routledge, London
- Shanas E et al (1968) Old people in three industrial societies. Routledge and Kegan Paul, London
- SOU (1956:1) Åldringsvård. (Old-age care) Swedish Government White Paper 1956 No. 1
- SOU (1981:70) Arbete eller pensionering. (Work or retirement). Swedish Government White Paper 1981 No. 5
- SOU (1993:111) Borta bra men hemma bäst? Fakta om äldre i Europa. (Away good but better at home? Facts about aging in Europe). Swedish Government White Paper 1993 No. 111
- Socialstyrelsen (2000) Bo hemma på äldre dar. (At home in one's old days). *Äldreuppsdraget 2000:11* (auth. G. Sundström) (www.sos.se)
- Socialstyrelsen (2004a) Framtidens anhörigomsorg. (Informal care in future) (auth. L. Johansson and G. Sundström) (www.sos.se)
- Socialstyrelsen (2004b) Äldres levnadsvilkår 1988–2002. (Living conditions of old people 1988–2002) (auth. Malmberg B, Sundström G) (www.sos.se)
- Socialstyrelsen (2006) Omsorg människor emellan. (Interpersonal care: An overview of informal care in the Swedish population) (auth Malmberg B, Sundström G) (www.sos.se)
- Statistics F (1953) Åldringarnas levnadsvilkår. (Living conditions of old people). *Sociala specialundersökningar* 20
- Statistics F (1992) Väesto 1992:1 Väestörakenne 1991 (The structure of population)
- Statistics N (1980) Folketeljinga 1801. Ny bearbeiding. (The 1801 census. A new analysis)
- Statistics N (2006) Et grånende Norge. (A greying Norway) *Rapporter 2006:21*

- Statistics S (1980) *Ensamhet och gemenskap. (Loneliness and community). Levnadsförhållanden Rapport 18*
- Statistics S (2006) *Tabeller över Sveriges befolkning 2005. (Tables on the Swedish population 2005)*
- Stehouwer J (1970) *De aeldres levevilkår VI Kontakter med familie. (Living conditions of old people VI Contacts with family) Copenhagen: Socialforskningsinstitutets publikationer 40*
- Ström A (1956) *De eldres levekår og helsetilstand. (Living conditions and health of old people). Oslo: De gamles helsekomité. Norske gerontologiske skrifter No. 2*
- Sundbärg, G (1915) *Demografiska förhållanden. (Demographic conditions). pp 95–134 in Sverige vol. 1. Stockholm: Norstedts förlag*
- Sundström G (1983) *Caring for the aged in welfare society. Stockholm Studies in Social Work 1*
- Sundström G (1985) *Hur nära? Om avstånd och närhet i svenska familjer (How close? On distance and closeness in Swedish families) Stockholm: HSB:s Riksförbund and School of Social Work, Work report, mimeo*
- Sundström G (1986) *Intergenerational mobility and the relationship between adults and their aging parents in Sweden. Gerontologist 26(4):367–372*
- Sundström G (1987) *A haven in a heartless world? Living with parents in Sweden and the United States, 1880–1982. Contin Chang 2(1):145–187*
- Sundström G (1995) *Ageing is riskier than it looks. Age and Ageing 24(5):373–374*
- Sundström G, Waerness K, in collaboration with Haavio-Mannila E, Ås D (1987) *Family and state in the Nordic countries. Unpublished manuscript. (in Swedish)*
- Sundström G, Johansson L, Hassing L (2002) *The shifting balance of long-term care in Sweden. Gerontologist 42(3):350–355*
- Sundström G, Johansson L, Hassing L (2003) *State provision down, offspring's up: The reverse substitution of old-age care in Sweden. Ageing Soc 23(3):269–280*
- Sundström G, Malmberg B, Johansson L, Sancho M (2006) *Support Policies for Family Carers in Europe. Manuscript. /prel. title/*
- Szebehely M (2005) *Anhörigas betalda och obetalda äldreomsorgsinsatser. (Paid and unpaid care by family members) Forskarrapport till Jämställdhetspolitiska utredningen SOU 2005:6 Makt att forma samhället och sitt eget liv. Government White Paper 2005 No. 6*
- Tedebrand L-G (1999) *Historia och demografi. Valda texter. (History and demography. Selected texts) Umeå: Kungliga Skytteanska Samfundets handlingar 50:A*
- United Nations (1999) *Socio-economic status and living arrangements of older persons in Finland. Economic Commission for Europe. Population Activities Unit: New York and Geneva*
- Winqvist M (1999) *Den åldrande familjen. (The ageing family). Uppsala University, Department of Sociology, Diss*

Chapter 6

Rapidly Aging Populations: Russia/Eastern Europe

Natalia S. Gavrilova and Leonid A. Gavrilov

Introduction

Population aging is a global phenomenon and countries of Eastern Europe are also experiencing a rapid increase in the proportion of older people. The proportion of elderly people in Eastern Europe is currently lower than in the European region as a whole. However population aging in this region is expected to continue over the next few decades, eventually leading to the convergence in the proportion of older people in the countries of Eastern and Western Europe.

Aging of population is often measured by the percentage of people of retirement ages. A society is considered to be relatively old when the fraction of the population aged 65+ years exceeds 8–10 per cent (Kinsella and Velkoff 2001). According to this definition, the populations of Eastern Europe and Russia are becoming very old, because the percentage of elderly people reached the levels of 14.2 and 13.8 per cent correspondingly in 2005 and it is expected to increase further. Because the choice of the boundary for old age (65 years and over) is rather arbitrary, many demographers who study Eastern European countries also use 60 years (retirement age for many countries of Eastern Europe) as a cut-off. In this case, a population is considered to be old when the proportion aged 60+ years exceeds 10–12 per cent (Kinsella and Velkoff 2001). Table 6.1 presents data on the proportion of population age sixty and over for selected countries. Note that populations of Bulgaria, Hungary

and Ukraine were older than the population of the European region in 2005. In addition to these three countries, the Czech Republic, Romania and Belarus have older populations than the Eastern European region. The proportion of very old population (80+) in all Eastern European countries is still lower than in the European region (Table 6.1), which may be explained by rather high mortality of the oldest age groups in these countries compared to Western Europe.

Figure 6.1 shows the trends in the proportion of people aged 60 years and over for Eastern Europe and Russia compared to the European region. Note that the fastest growth in the proportion of elderly in Russia and Eastern Europe occurred in the 1990s and since then both have experienced a slight decline in the proportion of people aged 60 years and over.

A useful indicator of age structure and population aging is the aging index (sometimes referred to as the elder-child ratio), defined as the number of people aged 65 and over per 100 youths under age 15 (see Table 6.2). In 1975 all countries of Eastern Europe had more youth than elderly (aging index below 100). Now all of them except Moldova have more elderly than youth. By 2030 all countries of Eastern Europe have a projected aging index of at least 100 and Bulgaria and Czech Republic are in excess of 200 (Kinsella and Velkoff 2001). The aging index is also useful in examining within-country differences in the level of population aging (Kinsella and Velkoff 2001).

The second class of indicators for population aging is a group of statistical measures of location (median, mean and modal ages of population). The median age is used particularly often as an indicator of the general age of people in some areas. Median age of population is the age at which exactly half the population is older and another half is younger. The 2005 median age in

N. S. Gavrilova (✉)
Center on Economics and Demography of Aging
NORC and The University of Chicago
1155 East 60th Street
Chicago, IL 60637, USA
E-mail: nsgavril@alumni.uchicago.edu

Table 6.1 Aging of population in Russia and the Eastern Europe

Countries/regions	Proportion of population 60+			Proportion of population 80+		
	1975	1995	2005	1975	1995	2005
Europe	16.4	19.0	20.7	1.8	3.1	3.5
Eastern Europe	14.4	17.1	18.2	1.3	2.3	2.4
Belarus	14.2	18.0	18.6	1.8	2.4	2.4
Bulgaria	16.1	21.4	22.4	1.4	2.6	2.9
Czech Republic	18.3	18.0	20.0	1.7	2.7	3.1
Hungary	18.3	19.4	20.8	1.7	2.9	3.2
Poland	13.8	15.8	16.8	1.2	2.1	2.5
Republic of Moldova	10.8	13.1	13.7	1.0	1.3	1.5
Romania	14.3	17.5	19.3	1.2	2.1	2.4
Russian Federation	13.6	16.7	17.1	1.2	2.2	2.2
Slovakia	13.8	15.1	16.2	1.2	2.1	2.5
Ukraine	15.8	18.4	20.9	1.6	2.6	2.7

Data source: United Nations 2007.

Europe was 39 years (Table 6.2), indicating that the number of people under age 39 equals the number who have already celebrated their 39th birthday. It is the simplest and most widely used indicator of the age of any population. Table 6.2 shows that population of Eastern Europe has a lower median age (37.5) than the population of the European region. At the same time, the population of Bulgaria has a higher median age than the population of Europe and Ukraine and Czech Republic have the same median age as Europe (Table 6.2). This indicator is also useful to monitor changes in population aging over time. Table 6.2 shows the increase in median age of Eastern European countries from 1975 to 2005. Note that Eastern Europe aged more slowly in the 1990s than the European region as a whole. However Bulgaria, Belarus and Slovakia demonstrated a particularly high pace of population aging.

Figure 6.2 shows time trends in median ages for populations of the European region, Eastern Europe and Russia. In contrast to the proportion of elderly (Fig. 6.1) this demographic indicator does not show any recent decrease in population aging for either Eastern Europe or Russia. This measure suggests that the fastest population aging in Eastern Europe and Russia happened in the 1950s and the 1960s.

The main problem in describing population aging is that any single indicator may be misleading because the age distribution of population is often very irregular, reflecting the scars of past events (wars, economic crises etc.). Thus, the age distribution cannot be described just by one number without significant loss of information. Therefore, perhaps the most adequate approach to study population aging is to explore the age distribution through a set of percentiles, or graphically by analyzing the population pyramids. The latter approach is particu-

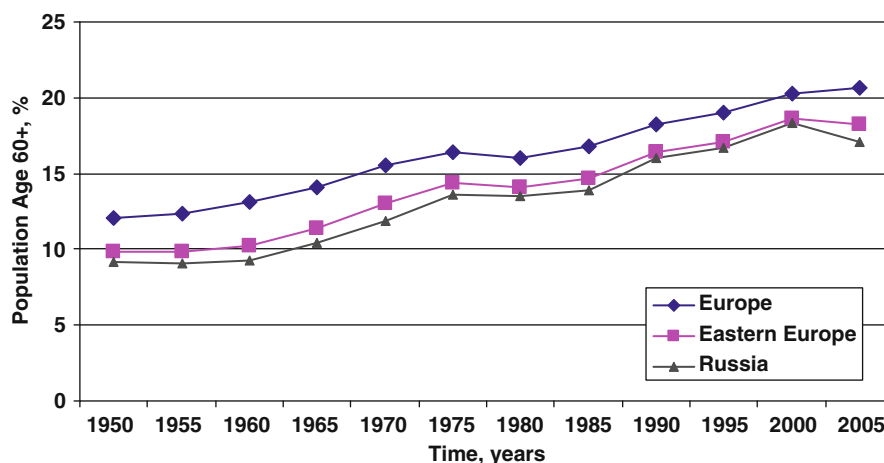


Fig. 6.1 Time trends in the proportion of the elderly (60+): Europe and Russia. Data source: United Nations 2006b

Table 6.2 Changes in median age and aging index in Russia and the Eastern Europe

Countries/regions	Median age			Aging index	
	1975	1995	2005	1975	2007
Europe	32.1	36.2	39.0	69.1	136.2
Eastern Europe	31.2	35.1	37.5	61.5	123.4
Belarus	30.5	34.8	37.8	55.7	126.9
Bulgaria	34.0	38.4	40.6	73.2	172.5
Czech Republic	32.6	36.2	39.0	82.3	150.7
Hungary	34.2	37.4	38.8	90.0	140.1
Poland	28.6	33.8	36.5	57.3	112.3
Republic of Moldova	26.2	30.8	33.0	37.4	81.6
Romania	30.8	34.0	36.7	56.5	130.3
Russian Federation	30.8	35.1	37.3	58.4	114.0
Slovakia	28.1	32.5	35.6	52.9	106.1
Ukraine	33.6	35.9	39.0	68.6	149.5

Data source: United Nations 2007.

larly useful for countries of the former Soviet Union (Russia, Ukraine, Belarus, Moldova), which experienced low fertility during World War II with a subsequent increase in births during the postwar period. These population waves affected proportions of later generations in these countries when WWII and postwar generations reached reproductive ages.

Demographic Determinants of Population Aging in Eastern Europe

Decline in Fertility

Demographic studies demonstrated that the declining fertility rates have the greatest role in causing population aging (Gavrilov and Heuveline 2003; Kinsella

and Velkoff 2001). Particularly rapid population aging, which is expected to occur in Eastern Europe and Russia after 2010, will mainly be due to fewer children born after the peak of the high postwar fertility. Population aging happens because the declining fertility rates make recent cohorts smaller than the preceding ones, thus tilting the age distribution towards older ages. Future changes in the rate of population aging will be conditioned by different sizes of birth cohorts entering and leaving reproductive ages.

Acceleration of population aging in Russia and Eastern Europe in the 1990s was also caused by low fertility during the period of economic transition in these countries. The period after 1989 witnessed a profound transformation in childbearing patterns in the countries of Eastern Europe, including a rapid decline in fertility rates, the postponement of childbearing and an upsurge in the proportion of extramarital births (Sobotka 2003).

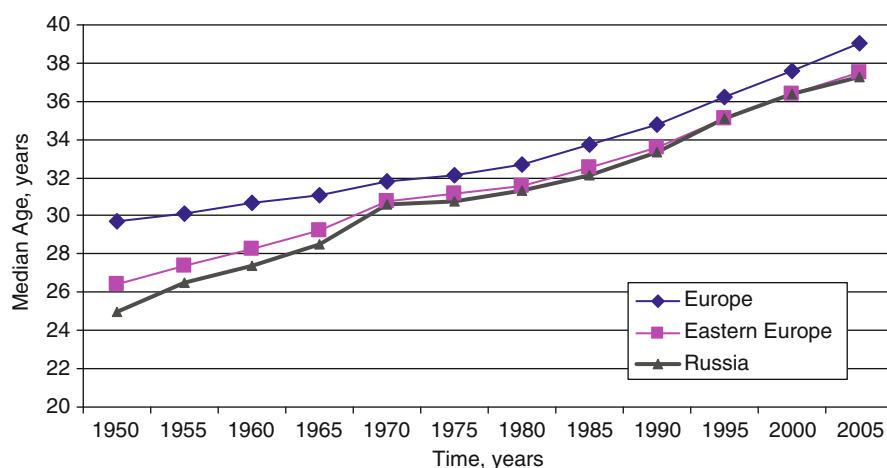


Fig. 6.2 Time trends in the median age of population: Europe and Russia. Data source: United Nations 2006b

Table 6.3 Total fertility rate (TFR)*, life expectancy at birth (LE) and causes of population change in Eastern Europe

Countries/regions	TFR (per woman)	LE	Per cent change in population, 1989–2004		
	2000–2005	2000–2005	Total	Natural increase	Migration
Europe	1.40	73.7			
Eastern Europe	1.27	67.9			
Belarus	1.24	68.1	–3.0	–3.3	0.3
Bulgaria	1.24	72.1	–13.2	–5.5	–7.7
Czech Republic	1.17	75.5	–1.4	–1.6	0.2
Hungary	1.30	72.6	–4.5	–4.7	0.2
Poland	1.26	74.3	0.8	2.6	–1.8
Republic of Moldova	1.23	67.5	–2.1	3.4	–5.5
Romania	1.26	71.3	–6.1	–0.7	–5.4
Russian Federation	1.33	65.4	–1.9	–5.9	3.9
Slovakia	1.20	74.0	2.2	3.2	–1.0
Ukraine	1.12	66.1	–8.2	–6.7	–1.5

* Average number of children that would be born to a woman in her lifetime, if she were to pass through her childbearing years experiencing the age-specific fertility rates for a given period.

Data Sources: United Nations 2005; Mansoor and Quillin 2007.

Currently, all countries of Eastern Europe demonstrate fertility below the European level (Table 6.3).

Researchers believe that the intensive decline of the total fertility rates indicate a uniform reaction of former Communist societies to the ongoing social and economic changes during the early 1990s and they note increasing diversity in current fertility patterns across the region (Sobotka 2003). It is believed that the more rapid postponement of parenthood was related to the success of the transition period, bringing more opportunities and choices for young people and shifting the institutional structure of many Eastern European societies considerably closer to the structure of Western European countries (Sobotka 2003). On the other hand, in many FSU countries like Ukraine, fertility declined to very low levels without a transition to a later pattern of childbearing, reflecting the persistence of traditional norms for childbearing and roles of men and women in this country (Perelli-Harris 2005).

Increasing Longevity

The effects of increasing life expectancy on population aging are more complex. The increase in life expectancy has two components, with opposing effects on population aging. The first component is the mortality decline among infants, children and people younger than the mean age of the population. This component of mortality decline acts against pop-

ulation aging, because its effect (saving young lives) is similar to the effect of increased fertility (Preston et al. 2001). Thus, the increase in life expectancy in Russia and Eastern European countries during the postwar period led to partial alleviation of population aging, because mortality decline in such countries was concentrated in the younger age groups. The second component of the increase in life expectancy is related to a more recent trend of mortality decline, which emerged after the 1950s in the developed countries – an accelerating decrease in mortality rates among the old and the oldest-old (85+ years) and the oldest-old women in particular (Gavrilov and Gavrilova 1991; Kannisto et al. 1994). This second component of mortality decline, concentrated in older age groups, is becoming an important determinant of population aging (women in particular) in industrialized countries. However, this component has not played a significant role in the aging of Russian and Eastern European populations so far. None of these countries experienced a significant increase in life expectancy during the last decades and in some of these countries (Russia, Belarus, and Ukraine) life expectancy decreased after 1990.

All countries of Eastern Europe and the former Soviet Union, with exception of the Czech Republic and Slovakia, have life expectancy below the European level (Table 6.3). There is also diversity in mortality trends and patterns across these countries. After a period of stagnating or even improving mortality in the 1980s, many countries of Eastern Europe experienced a

mortality crisis in the early 1990s after the fall of Communism (Nolte et al. 2005). In the Eastern European countries the increase of mortality did not last long and was replaced by mortality decline and growth in life expectancy. Now many countries of Eastern Europe are beginning to see a rapid decline in mortality at older ages (Mesle and Vallin 2006), so one may expect an increasing role of mortality decline as a contributing factor of population aging in these countries. Countries of the former Soviet Union (Russia, Moldova, Ukraine and Belarus) demonstrated a different pattern of mortality during the 1990s. Mortality fluctuations in these countries (with exception of Belarus) generally followed the mortality pattern observed in Russia (Andreev 1999, 2001), reflecting economic crises in this country (Gavrilova et al. 2000). Life expectancy in FSU countries at this time is either decreasing or stagnating at a relatively low level (Nolte et al. 2005). In the beginning of the 1990s, Belarus had the highest life expectancy among the FSU countries mentioned above (Andreev 2001). However, this advantage was lost due to a gradual decline in life expectancy during the late 1990s and early 2000s (Andreev 2001). The uncertain future of mortality changes in FSU countries affects the quality of demographic forecasts of population aging in these countries.

It is useful to consider population aging in a broader context of the demographic transition where a society moves from high rates of fertility and mortality to low rates. This transition is characterized first by declines in infant and childhood mortality as infectious and parasitic diseases are reduced. Other things being equal, this initial decline in mortality generates a younger population age structure. Then, when fertility starts to decline, populations begin to age. At the next step population aging is accelerated further, when the late-life mortality rates also start to decline. The combined synergistic effect of fertility decline and old-age mortality decline is known as the double aging process (Gavrilov and Heuveline 2003; Kinsella and Velkoff 2001). The demographic transition in Russia and countries of Eastern Europe started later than in Western Europe. As a result, Russian and Eastern European populations are younger than populations of the rest of Europe. Most countries of Eastern Europe lag behind Western Europe in their improvement of mortality at older ages. In some countries (Russia, Belarus, Ukraine) the process of rapid mortality decline at older ages is yet to

be observed, so that the double aging process in these countries remains a possibility at some future date.

Migration

The rate of population aging may also be affected by migration. Immigration usually slows down population aging, because immigrants tend to be younger. On the other hand, emigration of working-age adults accelerates population aging, as is observed now in many Eastern European nations. The Eastern European countries are not uniform in the direction and size of migrant flows (see Table 6.3). For example, the Czech Republic and Hungary have positive levels of net migration (Kaczmarczyk and Okolski 2005). On the other hand, Moldova, Romania, Poland and Ukraine are losing population due to migration (Kaczmarczyk and Okolski 2005). Emigration of young people may significantly accelerate population aging as happened in Bulgaria (Hristov 2004). Russia is the largest country in the region accepting immigrants (Kaczmarczyk and Okolski 2005) and has the second largest flow of immigrants after the United States (Mansoor and Quillin 2007). Immigration to Russia from other countries (mainly from the countries of the former Soviet Union) helps to alleviate the effects of population aging. Within Russia the migration processes accelerate population aging in rural regions of the European north and center (due to out-migration of youth) and slow it down in big cities like Moscow. Some demographers expect that migration will have a more prominent role in population aging in the future, particularly in low-fertility countries with stable or declining population size. For example, demographers at the Center of Demography and Human Ecology in Russia believe that immigration may help to slow down both population aging and depopulation in Russia (Vishnevskiy 2006).

The effects of fertility and migration on population growth and aging in Eastern European countries are shown in Table 6.3. Note that only Poland and Slovakia do not have negative population growth or depopulation (due to higher fertility). Also note that some countries (Bulgaria, Romania, Ukraine) demonstrate both negative natural increase (caused by low fertility) and negative net migration, thus being in “double

jeopardy” for rapid population aging. Some countries with high fertility like Moldova may experience rapid population aging due to high out-migration while immigration to Russia is able to alleviate negative consequences of low or negative natural increase.

Demographic Processes and Population Aging in the Russian Federation

Russia, with an elderly proportion of less than 14 per cent in 2005, is rather young by European standards although it is older than the United States (12.3 per cent).

Historical Events and Population Aging in Russia

Population aging in Russia is affected by its past historical events, which are best observed in the form of

a demographic pyramid. Figure 6.3 demonstrates a contemporary population pyramid of Russia, which resembles a shape of a Christmas tree due to sharp differences in the sizes of different birth cohorts. The irregular shape of the Russian demographic pyramid is a direct consequence of the following past events (Vassin 1996): (1) World War I and Civil War (1914–1922) resulting in decreased fertility during these years; (2) The famine of the early 1930s causing sharp decrease in the size of 1933–1934 birth cohorts as a result of both increased child mortality and decreased fertility; (3) World War II producing the largest distortions in the demographic pyramid including decrease of male cohorts born before 1927 and very small size of cohorts born in 1941–1945 due to low fertility. Very small birth cohorts born during the war period consequently produced a fall in the number of births during the 1960s. Later these small birth cohorts contributed to the decline in the number of births observed during the 1990s. All these historical events are reflected in the Russian demographic pyramid.

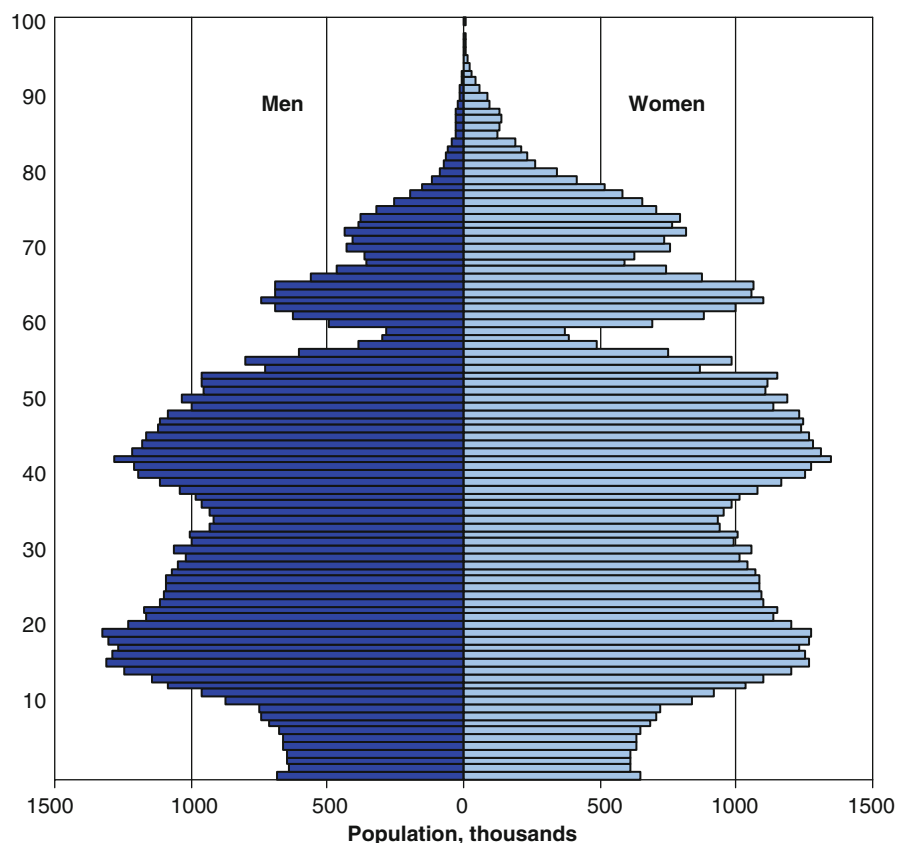


Fig. 6.3 Demographic pyramid of the Russian Federation according to the 2002 census. Goskomstat data

Recent Changes in Fertility and Mortality

The shape of the 2002 pyramid has the characteristics of an old population and is different from the 1989 pyramid, which had a broad base of young children born in the 1980s (Andreev et al. 2005). These population pyramid changes are a direct consequence of fertility decline in Russia during the economic transition period of the 1990s.

From 1950 to 1970, fertility in Russia changed from being amongst the highest in Europe (nearly three children per woman) to one of the lowest (1.8 children per woman in the birth cohort of 1945) (Avdeev and Monnier 1994; DaVanzo and Grammich 2001). In early 1980s the Soviet government introduced pronatalist policies, which resulted in a temporary increase in fertility rates between 1982 and 1987 (DaVanzo and Grammich 2001). By the end of the 1980s, however, the fertility pattern in Russia had shifted from one with highly diverse family sizes to one in which the one or two-child family model had been widely adopted (Avdeev and Monnier 1994). It is believed that pronatalist measures of the Soviet government did not produce a fundamental change in fertility behavior. The main result was that women spaced their births closer together rather than increasing the number of children that they ultimately had (DaVanzo and Grammich 2001). After 1990, fertility in Russia started to decline rapidly, most likely as a result of economic and political changes after the break-up of the Soviet Union. An increase in the cost of living and the cost of raising children in particular resulted in impoverishment of many families with children. In 1989 poverty in Russia was heavily concentrated among the elderly. However, in 2000 poverty became to a large extent a problem for people of work-active ages and their children (Gustafsson and Nivorozhkina 2004). Many Russian couples now cannot afford to raise children and fertility rates in Russia are now among the lowest in the world. There is significant regional variability in fertility rates within Russia, with North Caucasus demonstrating the highest and big cities (Moscow, St. Petersburg) the lowest (DaVanzo and Grammich 2001).

The rapid decline of fertility in early 1990s coincided with a rapid increase in mortality. In 1991–1992 the mortality trajectory crossed over the fertility trajec-

tory, forming a pattern that is now called the “Russian cross” (see Fig. 6.4) (Khalturina and Korotaev 2006).

In addition to the lowest-low fertility, declining life expectancy is another substantial component of an ongoing demographic crisis in Russia. Although life expectancy in Russia significantly increased from 1920 to 1960, after 1965 Russia experienced a slow but steady decrease in life expectancy for both men and women (DaVanzo and Grammich 2001). This decline temporarily stopped in 1985 with the introduction of Gorbachev’s anti-alcohol campaign (Mesle and Shkolnikov 1995; Shkolnikov et al. 1998). A significant decrease of alcohol sales was a substantial component of this campaign. Demographic results coming from this anti-alcohol campaign were a reduction of mortality (particularly among men) and an increase in life expectancy by more than 3 years from 1985 to 1987 (DaVanzo and Grammich 2001). Gorbachev’s anti-alcohol campaign, although successful from the view of public health results, was highly unpopular in Russia and was no longer in effect by the late 1980s. After this time mortality started to grow again and from 1992 to 1994 life expectancy of Russian males dropped from 63.8 to 57.7 years. Female life expectancy over these years dropped from 74.4 years to 71.2 years (Gavrilova et al. 2000). This decrease in life expectancy coincided in time with the introduction of painful market “reforms” in Russia, which lead to a rapid decrease in real wages and pensions, a nearly complete loss of personal savings and a tremendous increase in the poverty rate. The main causes of death that contributed to this mortality increase were diseases of the circulatory system, accidents, poisoning, injuries and diseases of the respiratory system (Notzon et al. 1998). After 1995, mortality in Russia showed a slow but stable decrease. However,

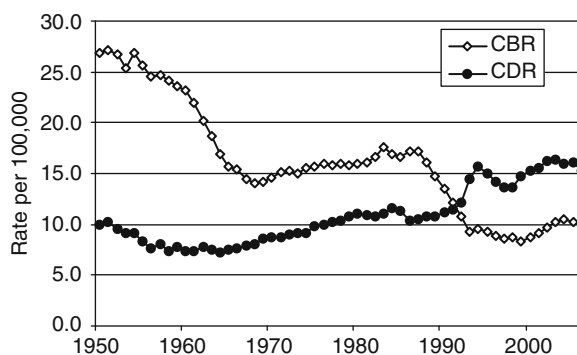


Fig. 6.4 Russian crude birth rate (CBR) and crude death rate (CDR), 1950–2006

in August 1998 Russia experienced another economic crisis (crash of the banking system) resulting in mass impoverishment. Shortly after this crisis mortality started to grow again and male life expectancy dropped from 61.3 in 1998 to 58.7 years in 2001, while female life expectancy dropped from 72.6 to 71.6 years during the same period (Gavrilova et al. 2000). For both men and women, those in the working age category appeared to be the most vulnerable, while children and the elderly were not significantly affected (Gavrilova et al. 2000; Notzon et al. 1998; Shkolnikov et al. 1998). The losses in life expectancy during 1992–1994 were more than 5 years for males and 3 years for females, compared to the life expectancy in pre-crisis 1991. This fall in life expectancy is beyond the peacetime experience of any industrialized country. After 2000 life expectancy in Russia stabilized at very low levels.

There are several explanations of the Russian mortality crisis of the 1990s. Increase in alcohol consumption is considered to be the major factor of the mortality increase and caused a rise of mortality from external causes (Anderson 2002; DaVanzo and Grammich 2001; Mc Kee et al. 2001; Nemtsov 1997, 2002; Pridemore 2002; Shkolnikov et al. 1998). Russian men drink alcohol significantly more often than women and have an exceptionally low life expectancy (the gender gap in life expectancy in Russia is the highest in the world). Gains in life expectancy during the Gorbachev anti-alcohol campaign were significantly higher for men than women, suggesting that alcohol plays a major role in the observed high mortality of Russian men. A recent small increase in Russian life expectancy in 2006, many experts argue, was a result of the temporary reduction of alcohol sales during summer of 2006. Another potentially important cause of increasing mortality after 1992 is the psychological stress experienced by adults during the transition period (Shkolnikov et al. 1998). The hypothesis of deteriorating medical care and public health system as a primary cause of mortality increase after 1992 did not find support from available data (Shkolnikov et al. 1998).

The most plausible explanation of rising mortality during the 1990s and current persistence of very high mortality in Russia is a hypothesis of population poverty and marginalization (Ivanova et al. 2004). Economic conditions of the early 1990s resulted in a rapid impoverishment of large segments of the population. Individuals who failed to cope with economic changes

lost jobs, housing, engaged in alcohol abuse and eventually became socially marginalized. Regional studies in Russia showed that socially less adapted persons (unemployed or those involved in low-skilled activities) are responsible for the majority (up to 90 per cent) of deaths at working ages (Ivanova et al. 2004). Survey data demonstrate that poverty is the major contributor to high cardiovascular mortality in Russia (Vagero and Kislitsyna 2005). The poorest fifth of the studied population were more than twice as likely as others to report heart symptoms (Vagero and Kislitsyna 2005). At the same time, other studies demonstrated that wealthy groups (e.g., persons having university/college degree) or population living in good socio-economic conditions (resident population of Moscow) have life expectancy comparable to that observed in developed countries (Shkolnikov et al. 1998). It is difficult to estimate accurately the proportion of the socially less adapted group in the total population but existing data indicate that it may comprise about 15–20 per cent of the population. This group appears to be responsible for the very high mortality in Russia of the working age population.

Most alcohol-related deaths in Russia occur in the narrow age interval of 45–55 years (Gavrilova et al. 2005). Therefore, the elderly in Russia may be considered as a selected population, which is less prone to alcohol abuse. Indeed, mortality at older ages did not demonstrate any significant increase during the 1990s and for men it has already returned to its pre-crisis levels (Nolte et al. 2005). However, physicians report a growing number of alcoholics among elderly men after 1994 as a response to the social and economic crisis (Gafarov et al. 2003).

Currently Russia is experiencing a decline in the proportion of older people due to relatively small cohorts born during the World War II period, which comprise a sizable part of the older population. However, as the large postwar birth cohorts begin to reach age 65 after 2010, the percentage of elderly in the Russian Federation will rise markedly – likely reaching 20 per cent by the year 2040 (United Nations 2006b). A similar increase in the proportion of the elderly in the United States is expected due to the very large baby boom cohorts reaching old age after 2010. During the period between the last two censuses of 1989 and 2002, the proportion of young people (below age 20) declined by 4.7 per cent while the proportion of older people (60 years and over) increased by 3.2 per cent (Andreev et al. 2005). Mean age of population increased by 3

years. What determined the population aging in Russia between 1989 and 2002 censuses? Andreev et al. (2005) estimated a contribution of different demographic processes in the population aging of Russia between the two censuses. It was estimated that living population enumerated in 1989 should age during the intercensal period by 13.7 years. However, part of this population did not survive to older ages thereby decreasing the actual mean population age by 5.5 years. Children born during this period helped to decrease the mean age of population by almost 5 years (their contribution would have been higher if the total fertility had not declined in the 1990s). Immigration of predominantly younger people also had some “rejuvenating” effect on the population of Russia. This process decreased the mean age of population by 0.2 years. According to (Andreev et al. 2005), population aging in Russia could be less prominent if the levels of fertility and mortality would remain stable at the level of 1988 (mean age would have increased by only 1 year instead of 3 years).

Regional Pattern of Population Aging

Within Russia, the current level and pace of population aging vary widely by geographic region and usually within regions as well (Andreev et al. 2005; Heleniak 2003). However, virtually all regions of Russia are now experiencing growth in their numbers of elderly residents. The percentage of population aged 60 and over in 2002 varied from 8 in the Far Eastern region to 21 per cent in the Central region. For many years the Central region has had the highest proportion of the older population. Table 6.4 shows changes in median age of population between two censuses for total,

urban and rural populations of Russia and its seven administrative territories (okrugs). Note that rural populations of the Central and Northwestern regions are the oldest while rural populations of the Far Eastern and Southern regions remain the youngest regions in Russia. Thus the rural population of Russia has higher regional differentiation by level of population aging than the urban population. On average the urban population of Russia is slightly younger due to migration of youth from rural areas to cities.

Due to a combination of long-term demographic trends and processes (including migration), population aging in Russia is the strongest among rural women. Whereas the proportion of women aged 65 and over in Russia is 16 per cent, older women comprise more than 30 per cent of the female population of some regions of Central and Northwestern Russia (Andreev et al. 2005).

The Russian population remains relatively young compared to other European countries, including countries of Eastern Europe. Currently, Russia is not aging rapidly but this situation will change after 2010 when the large postwar generations will reach age 60 and produce rapid aging of the population.

Demographic Profile of the Older Eastern European Populations

Feminization of Population Aging

The fact that in most nations females have lower mortality than males in every age group and for most

Table 6.4 Median age of population by Russian regions ('okrug')

Region	Total population		Urban population		Rural population	
	1989	2002	1989	2002	1989	2002
Russia	32.8	37.1	32.7	37.1	33.1	37.4
Central	35.9	39.9	34.8	39.3	41.1	42.2
Northwestern	33.0	38.5	32.9	38.2	33.9	40.2
Southern	32.0	34.2	32.8	35.2	30.7	32.9
Privolzhsky (adjacent to Volga)	32.5	37.4	32.0	36.9	34.1	38.5
Ural	31.3	35.8	31.4	35.5	31.0	36.8
Siberian	30.8	35.1	31.0	34.8	30.1	35.9
Far Eastern	29.3	33.9	29.9	34.3	27.7	32.3

Data source: Goskomstat 2004.

causes of death results in the “feminization” of population aging. This phenomenon is particularly acute in Russia and the other FSU countries that demonstrate high male/female mortality differentials. For example, Russia has the highest gender gap in life expectancy in the world, which exceeds 13 years (Table 6.5). At very old ages (80 years) differences in mortality between men and women in Russia decline and become even lower than in Europe (Table 6.5). On the other hand, most of the Eastern European countries have lower male/female mortality differentials than in the European region, being particularly low in Bulgaria and the Czech Republic (Table 6.5).

In 2005, in Russia there were 16.8 million older women and 8.4 million older men aged 60 and over, or a sex ratio of 50 men for every 100 women. This is the lowest proportion of men in populations aged 60 and over in the region. In 2007 in Eastern Europe this ratio was 57 men per 100 women and in the European region it was 69 men per 100 women. Some countries (Bulgaria, Romania and Czech Republic) have a higher male to female ratio in older population compared to the European region probably due to better longevity of men in Romania and Czech Republic and poor survival of older women in Bulgaria (Table 6.5). The male to female ratio decreases with age reaching 34 men to 100 women for persons 80 and over in Eastern Europe and only 27 in Russia (Table 6.6). Losses of men during World War II also contributed to this sex disproportion of older populations. It is projected that in Russia this sex disproportion will be partially allevi-

ated in the future (Vassin 1996). For comparison, in the United States the male/female ratio in 2007 was equal to 78 for persons aged 60 years and over and 54 for persons 80 years and over (United Nations 2007).

Aging of the Oldest-Old Population

Another notable observation in the aging world is that aging population has itself been aging: the “oldest-old” (people aged 80 and over) are now the fastest growing portion of the total population in many countries, including those in the European region (Gavrilov and Heuveline 2003). This process is observed in Eastern Europe but the pace of the oldest-old population increase is not as rapid as in the United States and other industrialized countries. In Russia, from 1990 to 2005, the population 80 years and over increased by 12 per cent and the population 60 to 79 years old increased by 8 per cent. In Eastern Europe the population 80 years and over increased by 13 per cent from 1990 to 2005. In contrast, the population 60 to 79 years old increased by 5 per cent. Compare these numbers with the United States where the population of the oldest-old increased by 59 per cent during the same period.

The proportion of oldest-old in the older population increased from 1975 to 2005 in the countries of Eastern Europe with average annual increase of 3 per cent, which was slower than in the European region (4 per cent, see Table 6.6). However, from 1995 to 2005, the proportion

Table 6.5 Sex differences in life expectancy, 2005–2010

Country/region	Life expectancy at birth			Life expectancy at age 60		Life expectancy at age 80	
	M	F	Gender gap in life expectancy	M	F	M	F
Europe	70.2	78.4	8.2	18.2	22.6	7.0	8.5
Eastern Europe	62.7	73.8	11.1	15.0	19.9	5.9	7.1
Belarus	63.1	74.5	11.4	14.1	19.5	5.6	6.8
Bulgaria	69.8	76.3	6.5	16.3	20.1	5.4	6.7
Czech Republic	73.1	79.4	6.3	17.5	22.0	6.1	7.6
Hungary	69.8	77.7	7.9	16.3	21.4	5.9	7.6
Poland	71.2	79.0	7.8	17.1	22.2	6.4	8.1
Republic of Moldova	66.0	73.1	7.1	15.4	18.9	5.7	6.8
Romania	68.7	75.7	7.0	16.6	20.1	6.0	6.8
Russia	58.7	71.8	13.1	13.9	19.2	5.9	7.1
Slovakia	71.1	78.7	7.6	16.7	21.7	6.4	7.7
Ukraine	60.7	72.5	11.8	14.6	19.6	5.6	6.8

Source: United Nations 2007.

Table 6.6 Aging among the older population, Russia and Eastern Europe

Countries/regions	Percentage of the oldest-old (80+) in older population (60+)			Annual percentage increase in the oldest-old population	
	1975	1995	2005	1975–2005	1995–2005
Europe	10.7	16.3	17.1	3.9	8.0
Eastern Europe	9.3	13.5	13.3	2.9	–2.0
Belarus	12.5	13.1	12.7	1.3	–4.0
Bulgaria	8.7	12.1	13.1	2.9	10.0
Czech Republic	9.5	15.2	15.3	2.7	1.0
Hungary	9.2	14.7	15.5	2.8	8.0
Poland	8.6	13.5	15.1	4.8	10.6
Republic of Moldova	9.0	10.0	11.1	2.4	10.1
Romania	8.2	12.1	12.4	3.6	3.0
Russian Federation	9.1	13.3	12.9	3.0	–4.0
Slovakia	9.0	14.2	15.2	1.3	10.0
Ukraine	10.0	14.3	12.7	2.0	–10.6

Source: United Nations 2007.

of oldest-old in older population decreased rather than increased in Russia, Ukraine and Belarus (Table 6.6). This phenomenon may be explained by increasing mortality of older persons in these countries and structural effects of different sizes of birth cohorts. At the same time such countries as Bulgaria, Poland, Moldova and Slovakia experienced rapid growth of the oldest-old proportion among the older population.

Social and Economic Implications of Population Aging in Eastern Europe

Population aging represents a challenge for public health (growing proportion of older people who need health assistance) and economic development (shrinking and aging of labor force, possible bankruptcy of pension systems). Rapid population aging of Russia and Eastern European countries will result in a range of potential problems including growing economic pressure on countries' pension systems, higher demand for health care and an increasing tax burden on a shrinking working-age population (Heleniak 2003).

Increasing Load on Social Welfare System

This problem is associated with the increase in the older population relative to the economically active

population. As age structures change and older individuals become a proportionally greater part of national populations, there are social and political pressures on transfer systems with a potential crisis of social support.

The potential support that the elderly may receive from the working population can be measured by the potential support ratio: the ratio of population aged 15–64 years to that aged 65 years and over (Mujahid 2006). This ratio of economically active (working) population to the elderly dependent population is crucial for an understanding of intergenerational transfers, taxation policies and saving behavior. It is used to estimate the support base available to carry the burden of the older population. The ratio is measured as an inverse of old-age dependency ratio (Gavrilov and Heuveline 2003). Values of the potential support ratio for the countries of Eastern Europe are presented in Table 6.7.

A falling potential support ratio from 1975 to 2007 indicates a shrinking support base. It is interesting that all countries of Eastern Europe, with exception of Ukraine and Bulgaria, still have higher potential support ratios than Europe. The potential support ratio implicitly assumes that people aged 15–64 are working and that those aged 65 years and over are not. In reality older people may work or have other sources of income and support their adult children. For example Kuhn and Stillman (2004) studied interhousehold transfers during the transition period in Russia and found that net interhousehold transfers flow predominantly from elderly and “empty-nest” households to younger households.

Table 6.7 Shrinking support base for the elderly in the countries of Eastern Europe

Country/region	Potential support ratio (population 15–64/ population 65+)			Parent support ratio (population 85+/population 50–64)		
	1975	2007	2025	1975	2007	2025
Europe	5.7	4.3	3.1	4.3	8.1	12.9
Eastern Europe	6.9	5.0	3.5	3.5	4.8	9.1
Belarus	6.6	4.9	3.9	5.7	4.6	7.9
Bulgaria	6.1	4.3	3.1	3.1	4.3	8.1
Czech Republic	5.0	4.9	2.9	3.2	4.9	9.0
Hungary	5.3	4.5	3.1	3.2	5.6	10.1
Poland	7.0	5.5	3.2	2.6	5.0	10.0
Republic of Moldova	9.5	7.2	4.4	2.8	3.0	6.1
Romania	6.8	4.7	3.6	2.7	4.3	8.1
Russia	7.7	5.3	3.8	3.6	4.8	8.8
Slovakia	6.7	6.0	3.5	2.8	4.7	7.8
Ukraine	6.4	4.3	3.3	3.9	5.0	10.2

Source: United Nations 2007.

Transfers allowed older Russians to subsidize working-age families adjusting to post-Soviet labor market and help them to raise children (Kuhn and Stillman 2004). This became possible because older people received more stable income in the form of pension payments while people at working ages were subjected to all of the uncertainties and fluctuations created by a free market.

Another indicator of potential support is a parent support ratio: a ratio of population aged 85 years and over to the population aged 50–64 years. This measure approximately relates those aged 85 and over to their presumed offspring (Mujahid 2006). This indicator reflects a burden of oldest-old population to their “offspring,” indicating the resource base of family support available to the oldest-old population. Table 6.7 shows uniform increase of the parent support ratio from 1975 to 2007 in the countries of Eastern Europe and highlights the growing challenge of providing adequate care for the oldest-old. Nevertheless, the values of parent support ratios in Eastern European countries are still much lower than in the entire European region.

In the developed countries, rapid aging places strong pressure on social security programs. In the countries of Eastern Europe this problem is exacerbated by a very low retirement age, particularly for women (see Table 6.8).

Eastern European countries inherited very generous and near universal pension systems from their Communist past based on the “pay-as-you-go” (PAYGO) principle. Benefits were based on years of service and

not the amount of contributions paid. The non-FSU countries of Eastern Europe tried different approaches to restructuring their pension systems against a general background of political changes and acute financial constraints (Fultz and Ruck 2001). Most of them restructured existing PAYGO systems and adopted a system of pension accounts based on individual contributions (Kritzer 2002).

Before the breakup of the Soviet Union, pensions in Russia were close to the average wage levels (DaVanzo and Grammich 2001). During the 1990s, pensions fell to less than 30 per cent of average wage value, resulting in widespread impoverishment of older people (DaVanzo and Grammich 2001). Even these small pensions were not paid on time between 1996 and 1999. This problem was also exacerbated by wage arrears experienced by many working families in the 1990s. Data from the Russia Longitudinal Monitoring Survey (RLMS) showed that wage arrears had detrimental effects on the well-being of the elderly in these families (Richter 2006). Salaries in households with wage arrears dropped by almost two-thirds and poverty doubled. The elderly cut back on food expenses and the nutritional content of food consumed, resulting in vitamin and mineral deficiencies. Functional limitations rose by 8 per cent for men and 3 per cent for women, and self-rated health declined by 2.5 per cent for men and 0.5 per cent for women (Richter 2006).

Difficulties with timely pension payments forced the Russian government to take steps toward reforming the Soviet style pension system. This old system

Table 6.8 Population aged 60 and over by marital status, economic activity, living arrangements and sex in the countries of the Eastern Europe: 2006

Country/region	Percentage currently married	Percentage living alone	Percentage in labor force	Statutory retirement age
	Men/Women	Men/Women	Men/Women	Men/Women
Europe	80/47	13/35	15/7	–
Eastern Europe	83/47	11/31	16/7	–
Belarus	81/39	–	12/4	60/55
Bulgaria	80/53 ¹	12/25	11/3	62.5/57.5 ²
Czech Republic	79/40	17/44	14/5	61.6/59–60 ³
Hungary	75/36	13/32	2/1	62/60 ⁴
Poland	74/46	10/28	14/7	65/60
Republic of Moldova	81/40 ¹	–	37/23	62/57
Romania	88/50	11/28	10/6	65/60
Russian Federation	77/36 ⁵	10/31	20/9	60/55
Slovakia	78/38	–	6/2	62/62
Ukraine	83/35 ¹	–	16/6	60/55

Source: United Nations 2006a.

¹ Data for 1985–1994.

² Increasing by 6 months every year until age 63 (men) and age 60 (women).

³ Increasing to age 63 (men) and ages 59–63 (women) by 2013. Age can vary for women according to the number of children raised.

⁴ Increasing for women to age 61 by 2007 and age 62 by 2009.

⁵ Goskomstat data based on 2002 Russian census (UN data present unrealistically high percentage of married women for Russia).

had several limitations (Maleva and Sinyavskaya 2005): (1) low level of pension payments, which were not adjusted for inflation, resulting in persons who retired long ago having very small pensions compared to recent retirees; (2) low differentiation of pension benefits, which did not take into account past income; (3) relatively low retirement age (60 years for men and 55 for women); and (4) common occurrence of early retirement (even earlier than 60 or 55 years) for many professional groups. Western researchers also mention lack of individual choice and lack of alternative pension financing as limitations of the Soviet pension system (Williamson et al. 2006), although probably most Russians did not consider this to be a limitation (few Russians opted out of state pension financing and chose private pension funds during the recent pension reform). Since 1991 there were several attempts to reform the pension system in Russia (Maleva and Sinyavskaya 2005). Finally, in 2001, Russia selected the World Bank model of pension reform, which implements individual pension accounts (Maleva and Sinyavskaya 2005; Williamson et al. 2006). The World Bank strongly recommended a transition from the existing defined benefit scheme to an alternative that included a notional defined contribution component (Williamson et al. 2006). This reform is currently

underway but it faces many difficulties besides population aging *per se*. The reforms adopted in Russia were largely based on the system of accumulating funds in personal pension accounts. Current actuarial forecasts in Russia show that the proportion of these funds in the total pension for young adults is very small and does not exceed 15 per cent. Many young people in Russia are involved in informal jobs, which do not include any paperwork and hence, no taxation and pension payments. It was also planned to reduce the early retirement practice and to replace it by professional pension systems. However, difficulties in reaching agreement between state, employers and employees postponed the introduction of such pension systems. It was expected that the new pension system would encourage both employers and employees to participate in legal businesses, thus increasing contributions to the Pension Fund. However population surveys show that this has not taken place. Increase of retirement age meets very strong opposition in the Russian society, where life expectancy of men does not even reach the statutory retirement age. The state monopoly in pension system management has not decreased but has rather increased in recent years (Maleva and Sinyavskaya 2005). Finally, authors of the report note very high dependence of the Russian pension system on

political decisions and political risks, which strongly affect its solvency (see Maleva and Sinyavskaya 2005 for more detail). Currently the Russian pension system encounters numerous problems besides those created by population aging.

Living Arrangements Among the Elderly in Eastern Europe

Population aging also causes changes in living arrangements, resulting in an increasing number of older people living alone (see Table 6.8). Because older persons usually have lower incomes, with many living below the poverty line, population aging results in increasing poverty in many countries of Eastern Europe. This is particularly the case for the countries of the former Soviet Union (Russia, Ukraine, Belarus, Moldova) with small pensions, which are generally below the subsistence level. Economic needs may force older people to continue their work beyond the retirement ages.

The consequence of very high male mortality in Russia and other FSU countries is a high proportion of non-married women at older ages: over sixty per cent of women over age 60 in 2005 were not married. The proportion of non-married women was slightly lower in Bulgaria, Romania and Poland but still higher than in many industrialized countries (Table 6.8).

Table 6.9 shows proportion of persons living alone in selected Eastern European countries. Note the high proportion of older people living alone in the Czech Republic, which may reflect an adoption of western lifestyle rather than abandonment of the elderly. It also shows that unmarried people are more likely to live alone. Although relatively high proportion of older Russian women live alone, older Russian men are the least likely to live alone among the compared countries.

The data discussed above however are rather old and may not reflect the most recent trends in living arrangements of older people. Such data were obtained during a survey conducted by the fund "Public Opinion" in Russia (Vovk 2006). According to this survey, there are no established social norms regarding coresidence of older people with their children in Russia. When asked about benefits of older people coresiding with their children and grandchildren, 40–43 per cent of respondents found more negative than positive aspects in such living arrangements while 34–36 per cent had an opposite opinion. The responses were similar for both older and younger respondents. On average slightly more respondents found negative aspects of coresidence with the elderly compared to those who found more positive aspects of coresidence (Vovk 2006). Another survey of 1,500 respondents conducted in 2005 in Russia gives information on living arrangements among older people of different ages (Presnyakova 2006). According to the survey, 26 per cent of people aged 60–69 years and 39 per cent of those aged 70 years and over live alone. These data show that proportion of older people living alone increases with age. Table 6.10 demonstrates the same phenomenon for five selected countries. The highest proportion of the oldest-old living alone is observed in the Czech Republic and the lowest proportion in Russia.

The proportion of older population living in institutions reflects the demand for long-term care but may also reflect constraints related to government ability to provide sufficient funds for this kind of service. Existing data on the proportion of institutionalized population by age presented in Table 6.10 refer to the early 1990s. The proportion of older people residing in institutions is higher in the oldest age group but is overall much lower than in the Western European countries (De Vos and Sandefur 2002).

Table 6.9 Proportion of persons aged 60 years or over living alone: Total and unmarried population, by sex (percentage)

Country/region	Year	All			Unmarried		
		Total	Men	Women	Total	Men	Women
Bulgaria	1992	19.0	11.9	24.8	52.4	57.9	50.5
Czech Republic	1991	33.6	17.4	44.2	70.1	74.4	69.1
Hungary	1990	24.3	13.0	32.0	51.7	53.7	51.2
Romania	1992	20.3	10.6	27.7	52.5	56.5	51.5
Russia	1989	24.8	10.1	31.3	47.3	56.2	46.3

Source: United Nations 2005.

Table 6.10 Proportion of persons aged 60 years or over living alone and in institution, by age group (percentage)

Country/region	Year	Age						
		Total	60–64	65–69	70–74	75–79	80–84	85+
Proportion living alone								
Bulgaria	1992	19.0	11.8	16.9	22.0	27.6	29.9	28.9
Czech Republic	1991	33.6	21.1	28.8	36.2	44.1	50.2	51.3
Hungary	1990	24.3	17.1	22.0	27.0	31.8	33.4	32.3
Romania	1992	20.3	12.6	17.9	24.4	29.4	31.8	31.5
Russia	1989	24.8	18.4	25.5	30.5	31.2	29.4	23.5
Proportion living in institution								
Country/region		Total	60–64	65–69	70–74	75+		
Bulgaria	1992	0.4	0.2	0.2	0.3	0.7		
Czech Republic	1991	2.0	0.5	0.7	1.3	4.6		
Hungary	1990	1.2	0.5	0.6	1.0	2.6		
Romania	1992	0.3	0.2	0.2	0.3	0.5		
Russia	1989	0.7	0.4	0.5	0.7	1.1		

Source: United Nations 2005.

Rising Demand for Health Services

One of the main challenges of an aging population is the increasing demand for health care services. Older people (oldest-old in particular) are prone to higher rates of morbidity. As nations age, a shift in disease patterns become inevitable, increasing the societal burden of providing adequate resources for elders' health care.

Healthy life expectancy (HALE) can be used to assess differences in mortality and morbidity across countries and is interpreted as expected lifetime in full health (WHO 2004). Table 6.11 shows values of HALE at birth and at age 60 for countries of Eastern Europe, as

well as expectation of lost healthy years at birth. Note that FSU countries have the lowest values of HALE among the countries of Eastern Europe. At the same time, men and women in Russia, Ukraine and Belarus have the fewest years spent in a state of ill health because of high mortality at all ages. Shorter time spent in the state of ill health decreases the overall burden on health care system in these countries. It was estimated that the working-age mortality in Russia may be so high that the future pension obligations would be reduced to the levels sufficient for the nation to support current pension programs (DaVanzo and Grammich 2001).

Health surveys demonstrate consistently worse health in Russia compared to Western countries. For

Table 6.11 Healthy life expectancy in the countries of Eastern Europe, 1992

Country	Healthy life expectancy				Expectation of lost healthy years at birth (years)		Percentage of total life expectancy lost	
	Men		Women		Men	Women	Men	Women
	At birth	At age 60	At birth	At age 60				
Belarus	56.6	10.5	64.9	14.6	6.1	9.4	9.7	12.6
Bulgaria	62.6	12.5	67.1	15.0	6.2	8.5	9.1	11.3
Czech Republic	65.9	13.5	70.9	16.8	6.6	8.1	9.1	10.3
Hungary	61.5	12.1	68.2	16.0	6.8	8.6	10.0	11.2
Poland	63.1	12.8	68.5	16.1	7.5	10.2	10.6	13.0
Republic of Moldova	57.2	11.0	62.4	13.2	6.8	9.2	10.6	12.9
Romania	61.0	12.3	65.2	14.6	7.0	9.7	10.3	13.0
Russian Federation	52.8	9.7	64.1	14.0	5.5	7.7	9.4	10.7
Slovakia	63.0	12.3	69.4	16.1	6.7	8.9	9.6	11.4
Ukraine	54.9	10.3	63.6	13.7	6.8	9.4	11.0	12.8

Source: WHO 2004.

example, surveys conducted in Galesburg, Illinois and Moscow, Russia found that self-assessed health was good for 77 per cent of Americans and only 6 per cent of Russians (Jogerst et al. 2006), although the Russian sample was about ten years younger than the American sample (mean age of 67 years and 78 years respectively). It is interesting that sixty per cent of Russians took no medications compared with 14 per cent of Americans but Russians reported more cardiovascular disease, angina and hypertension (Jogerst et al. 2006). These differences may be partially explained by difficulties in gaining access to medical care by older people in Russia (Sinyavskaya 2006). Although the health care system in Russia includes free services, many pensioners report difficulties in obtaining qualified medical care (Sinyavskaya 2006).

Alcohol abuse and other lifestyle factors (tobacco smoking, malnutrition, low exercise) are usually mentioned as the main cause of high mortality and poor health in Russia and other FSU countries (Nolte et al. 2005). Indeed, WHO data show high prevalence of lifestyle risk factors in these countries. For example, prevalence of smoking among Russian (56.7 per cent) and Ukrainian (66.8 per cent) men is significantly higher than among Czech men (38.9 per cent) (WHO 2007). Although the consumption of alcohol in Russia reported by WHO is not the highest in Europe, Russian men tend to consume predominantly strong liquors (vodka), which are the most detrimental to health and to drink in binges (McKee et al. 2001; Shkolnikov et al. 1998; Shkolnikov et al. 2002).

DALY (Disability Adjusted Life Years) is a useful indicator to measure the contribution of different causes to mortality and morbidity. DALYs for a disease or health condition are calculated as the sum of the years of life lost due to premature mortality (YLL) in the population and the years lost due to disability (YLD) for incident cases of the health condition (WHO 2002). According to WHO data, the burden of cardiovascular disease accounted for almost one third of the overall burden of disease in Russia, Ukraine and Belarus, while the impact of neuropsychiatric disease and cancer was significantly lower than in Western European countries (Nolte et al. 2005). Contribution of injuries to burden of disease was also exceptionally high in the FSU countries compared to the countries of Western Europe. The World Health Report (WHO 2002) also provides data on contribution of major risk factors to the overall burden of disease using DALYs. Alcohol and tobacco use are

the major factors of ill health for men in the FSU countries, in contrast to obesity and tobacco use for men in Western Europe (WHO, 2002). Contribution of alcohol to ill health was higher and the contribution of tobacco use was lower for FSU women compared to Western European women (WHO 2002).

However, alcohol abuse is not the only factor of poor health among Russian men and women. Studies showed that the economic hardship and poverty of the 1990s have had detrimental effects on health, particularly for men. For example, during 1996–1999, many pensioners did not receive pensions for an extended period of time. RLMS data showed that among affected pensioners, poverty rates doubled and the intake of calories and protein and the use of health services and medications declined significantly. These pensioners were also 5 per cent more likely to die in the two years following the crisis (Jensen and Richter 2004). Another survey demonstrated that the poorest fifth of the respondents were more than twice as likely as others to report heart symptoms. Problems in affording vegetables, meat or fish, clothes and footwear were linked to heart symptoms more closely than other economic indicators (Vagero and Kislitsyna 2005).

Summarizing this brief review of health in the countries of Eastern Europe, we may conclude that FSU countries lagged behind other countries of Eastern Europe in both health indicators and reforms of their health care systems. Many countries of Eastern Europe (such as the Czech Republic or Poland) could successfully reform their health systems and make significant achievements in mortality reductions. FSU countries reformed their health systems in the direction of replacing free services by paid services, which made many of them unaffordable to less wealthy groups and to older people in particular.

Projections of Population Aging in the 21st Century

Before the 1980s the process of population aging was considered as an exclusive consequence of fertility decline and it was predicted that the pace of population aging would decrease after stabilization of fertility rates at some low levels. However, the rapid decline in mortality at older ages observed in developed countries in the last decades of the 20th century accelerated the process

Table 6.12 Dynamics of population aging in Russia and Eastern Europe

Country /region	1975		2000		2030	
	60+	80+	60+	80+	60+	80+
Europe	16.4	1.6	20.3	2.9	29.7	6.0
Eastern Europe	14.4	1.3	18.6	2.0	26.4	4.1
Belarus	14.2	1.8	19.3	1.9	26.1	3.3
Bulgaria	16.1	1.4	22.0	2.1	29.5	5.2
Czech Republic	18.3	1.7	18.3	2.3	30.2	6.4
Hungary	18.3	1.7	19.8	2.5	28.4	5.6
Poland	13.8	1.2	16.6	2.0	27.6	4.9
Republic of Moldova	10.8	1.0	13.8	1.2	23.0	2.9
Romania	14.3	1.2	19.1	1.8	26.7	4.1
Russia	13.6	1.2	18.3	2.0	24.9	3.6
Slovakia	13.8	1.2	15.4	1.8	27.3	4.6
Ukraine	15.8	1.6	20.7	2.3	28.6	4.6

Observed and Forecasted (Medium Variant) Percentages of the Elderly (60+ years) and the Oldest-Old (80+ years) in Different Countries of the Eastern Europe: 1975, 2000 and 2030

Data source: United Nations 2006b.

of population aging in these countries. Now human mortality is a key demographic component in projecting the size and composition of the world's future elderly population. Current and future uncertainties about changing mortality may produce widely divergent projections of the size of tomorrow's elderly population. The problem of uncertainty about future changes in mortality is particularly acute for Russia and the countries of Eastern Europe, which demonstrated periods of both mortality growth and decline during the last two decades.

Table 6.12 shows observed and forecasted proportions of the elderly and the oldest-old in the countries of Eastern Europe. Forecasted data correspond to the medium variant of the UN demographic projections. The medium variant assumes that total fertility in

all countries will converge eventually toward a level of 1.85 children per woman. Note that all countries, with the exception of the Czech Republic, will have lower proportions of older age groups in 2030 than the total European population. Relatively high proportions of older people in 2030 are also expected in Hungary, Bulgaria, Poland, Slovakia and Ukraine.

An example from Russia illustrates the range of future uncertainty about the future size of the oldest-old population. The United Nations projections estimated the proportions of people aged 60 and over in Russia to be 24.9 per cent (medium fertility variant), 23.2 per cent (high fertility variant), 27 per cent (low fertility variant) and 25.9 (constant fertility variant). The differences in these projections result almost exclusively from the assumptions about fertility rates. Adult mor-

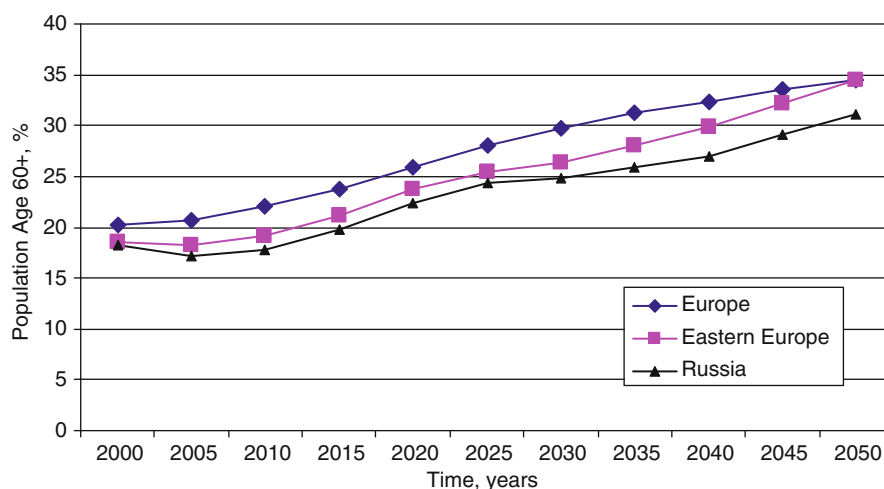


Fig. 6.5 Projected proportions (medium variant) of the population aged 60 and over for Europe and Russia. Source: United Nations 2006a

tality rates are assumed to decline in all countries, with smaller improvements occurring the higher the life expectancy already reached.

According to the IASA projections, from 2000 to 2050 the proportion of the world population above age 60 would increase from 10 to 22 per cent. In Western Europe it would increase from 20 to 35 per cent for the same period (Lutz et al. 2001). Around year 2050 the proportion of population above age 60 in Eastern Europe would be approximately the same as in Western Europe. The projected trends in the proportions of the elderly (60+) made by the United Nations are presented in Fig. 6.5. Note that by 2050 population aging in Eastern Europe will reach the same level as exists for the rest of Europe. In Russia, however, the proportion of the elderly will remain relatively low compared to the European region.

Summary

Russia and most countries of Eastern Europe lag behind Western Europe in the degree of population aging. Low fertility is the major determinant of population aging in these countries. The role of migration varies across the countries and is a significant determinant of population aging in the countries experiencing high out-migration flows (like Bulgaria or Moldova). Until recently, increasing longevity did not play a significant role in population aging in Russia and Eastern Europe. It is expected that longevity may soon become a significant determinant of population aging in the countries demonstrating a rapid decrease of mortality (Czech Republic, Slovakia, Poland). In the FSU countries, the effects of longevity increases on population aging is a possibility in the more distant future. The latter fact makes overall pressure on social welfare and health care systems caused by population aging less prominent for these countries compared to other industrialized countries.

References

- Anderson BA (2002) Russia faces depopulation? Dynamics of population decline. *Popul Environ* 23(5):437–464
- Andreev E (1999) The dynamics of mortality in the Russian Federation. In: *Health and mortality. Issues of global concern*. New York, United Nations, pp 262–283
- Andreev EM (2001) Six Post-Soviet countries: Mortality before and after the break-up of the USSR. *Demoscope Weekly* [online journal] 43–44, <http://www.demoscope.ru/weekly/043/tema01.php>.
- Andreev EM, Vishnevsky AG, Kvasha E, Kharkova T (2005) Russian age-sex pyramid. *Demoscope Weekly* [online journal] 215–216, <http://www.demoscope.ru/weekly/0215/tema02.php>
- Avdeev A, Monnier A (1994) A survey of modern Russian fertility. *Population* 49(4–5):859–901
- DaVanzo J, Grammich CA (2001) Dire demographics. *Population trends in the Russian Federation*. RAND, Santa Monica, CA
- De Vos S, Sandefur G (2002) Elderly living arrangements in Bulgaria, the Czech Republic, Estonia, Finland, and Romania. *Eur J Popul* 18(1):21–38
- Fultz E, Ruck M (2001) Pension reform in Central and Eastern Europe: Emerging issues and patterns. *Int Labour Rev* 140(1):19–25
- Gafarov VV, Pak VA, Gagulin IV, Babina TD (2003) Ten year dynamics of attitude to health problems in male population of Novosibirsk. *Ter Arkhiv* 75(1):27–30
- Gavrilov LA, Gavrilova NS (1991) *The biology of life span: A quantitative approach*. Harwood Academic Publisher, New York
- Gavrilov LA, Heuveline P (2003) Aging of population. In: Demeny P, McNicoll G (eds) *The encyclopedia of population*, Macmillan Reference USA, New York, pp 32–37
- Gavrilova NS, Gavrilov LA, Semyonova VG, Evdokushkina GN, Ivanova AE (2005) Patterns of violent crime in Russia. In: Pridemore WA (ed) *Ruling Russia: Law, crime, and justice in a changing society*, Rowman & Littlefield Publ., Inc., Boulder, CO, pp 117–145
- Gavrilova NS, Semyonova VG, Evdokushkina GN, Gavrilov LA (2000) The response of violent mortality to economic crisis in Russia. *Popul Res Policy Rev* 19(5):397–419
- Goskomstat (2004) Results of the 2002 All-Russia population census. Distribution by age, sex and marital status. vol 2, Moscow: Statistika Rossii
- Gustafsson B, Nivorozhkina L (2004) Changes in Russian poverty during transition as assessed from microdata from the city of Taganrog. *Econ Transit* 12(4):747–776
- Heleniak T (2003) Geographic aspects of population aging in the Russian Federation. *Eurasian Geogr Econ* 44(5):325–347
- Hristov E (2004) The aging of the population in South-Eastern Europe. *SEER - South-East Eur Rev Labour Soc Aff* 3:119–130
- Ivanova AE, Semyonova VG, Dubrovina E (2004) Marginalization of Russian mortality. *Demoscope Weekly* [online journal] 181–182, <http://demoscope.ru/weekly/2004/0181/tema01.php>
- Jensen RT, Richter K (2004) The health implications of social security failure: Evidence from the Russian pension crisis. *J Public Econ* 88(1–2):209–236
- Jogerst GJ, Daly JM, Hesli V, Saha C (2006) Comparison of health and effective functioning in Russia and the United States. *Clin Interv Aging* 1(2):189–196
- Kaczmarczyk P, Okolski M (2005) *International migration in Central and Eastern Europe – current and future trends*. UN Population Division, New York
- Kannisto V, Lauritsen J, Thatcher AR, Vaupel JW (1994) Reductions in mortality at advanced ages - several

- decades of evidence from 27 Countries. *Popul Dev Rev* 20(4):793–810
- Khalturina DA, Korotaev AV (2006) Russian cross. Factors, mechanisms and pathways of overcoming demographic crisis in Russia. [In Russian]. Moscow: Komkniga
- Kinsella K, Velkoff VA (2001) *An aging world: 2001*. U.S. Government Printing Office, Washington, DC
- Kritzer BE (2002) Social security reform in Central and Eastern Europe: Variations on a Latin American theme. *Soc Secur Bull* 64:16–32
- Kuhn R, Stillman S (2004) Understanding interhousehold transfers in a transition economy: Evidence from Russia. *Econ Dev Cultural Change* 53(1):131–156
- Lutz W, Sanderson W, Scherbov S (2001) The end of world population growth. *Nature* 412(6846):543–545
- Maleva TV, Sinyavskaya OV (2005) Pension reform in Russia: History, results, prospects. Pomatur, Moscow
- Mansoor A, Quillin B (2007) Migration and remittances. Eastern Europe and the Former Soviet Union. The World Bank, Washington, DC
- McKee M, Shkolnikov V, Leon DA (2001) Alcohol is implicated in the fluctuations in cardiovascular disease in Russia since the 1980s. *Annals Epidemiol* 11(1):1–6
- Mesle F, Shkolnikov VM (1995) Mortality in Russia: A public health crisis in two stages. *Rev Etud Comp Est Ouest* 26(4):9
- Mesle F, Vallin J (2006) Interpreting recent mortality changes in the former USSR in the light of long term trends and reference to Central Europe. In: *Mortality in countries of the former USSR. Fifteen years after break-up: Change or continuity?* IUSSP: Kiev, vol. 2, pp 68–88
- Mujahid G (2006) Population ageing in East and South-East Asia. UNFPA, Bangkok, Thailand
- Nemtsov AV (1997) Alcohol consumption and mortality in Russia. *Sotsiol Issled* 9:113–116
- Nemtsov AV (2002) Alcohol-related human losses in Russia in the 1980s and 1990s. *Addiction* 97(11):1413–1425
- Nolte E, McKee M, Gilmore A (2005) Morbidity and mortality in the transition countries of Europe. In: Macura M, MacDonald AL, Haug W (eds) *The new demographic regime. Population challenges and policy responses*, United Nations: New York and Geneva, pp 153–176
- Notzon FC, Komarov YM, Ermakov SP, Sempos CT, Marks JS, Sempos EV (1998) Causes of declining life expectancy in Russia. *J Am Med Assoc* 279(10):793–800
- Perelli-Harris B (2005) The path to lowest-low fertility in Ukraine. *Popul Stud J Demogr* 59(1):55–70
- Presnyakova L (2006) Social, material and emotional climate of aging in Russia. *Demoscope Weekly* [online journal] 257–258, <http://www.demoscope.ru/weekly/2006/0257/analit01.php>
- Preston SH, Heuveline P, Guillot M (2001) *Demography. Measuring and modeling population processes*, Blackwell Publishers, Oxford, UK
- Pridemore WA (2002) Vodka and violence: Alcohol consumption and homicide rates in Russia. *Am J Public Health* 92(12):1921–1930
- Richter K (2006) The well-being of the elderly and wage arrears in Russia. *J Eur Econ Assoc* 4(1):116–152
- Shkolnikov VM, Cornia GAA, Leon DA, Mesle F (1998) Causes of the Russian mortality crisis: Evidence and interpretations. *World Dev* 26(11):1995–2011
- Shkolnikov VM, Leon DA, Adamets S, Andreev E, Deev A (1998) Educational level and adult mortality in Russia: An analysis of routine data 1979 to 1994. *Soc Sci Med* 47(3):357–369
- Shkolnikov VM, McKee M, Chervyakov VV, Kyrianov NA (2002) Is the link between alcohol and cardiovascular death among young Russian men attributable to misclassification of acute alcohol intoxication? Evidence from the city of Izhevsk. *J Epidemiol Community Health* 56(3):171–174
- Sinyavskaya OV (2006) Poverty of pensioners. *Demoscope Weekly* [online journal] 257–258, <http://www.demoscope.ru/weekly/2006/0257/tema01.php>
- Sobotka T (2003) Re-emerging diversity: Rapid fertility changes in Central and Eastern Europe after the collapse of the Communist regimes. *Population* 58(4–5):511–547
- United Nations (2005) *Living arrangements of older persons around the world*. New York: United Nations
- United Nations (2006a) *Population aging 2006*. Wall chart. <http://esa.un.org/unpp/>
- United Nations (2006b) *World population prospects: The 2004 revision population database*, <http://esa.un.org/unpp/>
- United Nations (2007) *World population ageing 2007*. United Nations, New York
- Vagero D, Kislitsyna O (2005) Self-reported heart symptoms are strongly linked to past and present poverty in Russia: Evidence from the 1998 Taganrog interview survey. *Eur J Public Health* 15(4):418–423
- Vassin SA (1996) The determinants and implications of an aging population in Russia. In: DaVanzo J (ed) *Russia's demographic "crisis"*, RAND Corporation, Santa Monica CA
- Vishnevskiy AG (2006) *Demographic modernization of Russia: 1900–2000*. Novoe Izdatelstvo, Moscow
- Vovk E (2006) Elderly in family: Specifics of intergenerational interactions. *Demoscope Weekly* [online journal] 249–250 <http://www.demoscope.ru/weekly/2006/0249/analit05.php>
- WHO (2002) *World Health Report*. Geneva
- WHO (2004) *Estimated healthy life expectancy (HALE) at birth and age 60, by sex, WHO Member States, 2002*. Geneva www.who.int/healthinfo/statistics/gbdwhr2004hale.xls
- WHO (2007) *World health statistics 2007. Risk factors*. Geneva
- Williamson JB, Howling SA, Maroto ML (2006) The political economy of pension reform in Russia: Why partial privatization? *J Aging Studies* 20(2):165–175

Chapter 7

Rapid Population Aging and Changing Intergenerational Transfers in Japan

Naohiro Ogawa, Rikiya Matsukura and Maliki

Introduction

Primarily because the fertility transition in a number of Asian countries, particularly in East and Southeast Asia, has been considerably shorter than in the developed countries, the speed of population aging in Asia has been and will be substantially faster than that observed among the industrialized nations in Europe. In the post-World War II period, Japan's fertility decline was the earliest to occur not only in Asia but also in the world. In addition, it was also the greatest in magnitude among all the industrialized nations.

For several decades, Japan's population aging level has been by far the highest in Asia. Moreover, in 2005 the population of Japan became the oldest national population in the entire world, surpassing the Italian population and the size of total population began decreasing (Ogawa 2005). These recent demographic developments in Japan have been causing a great amount of concern in various spheres of Japanese society. For example, rapid population aging has already imposed serious financial pressures on the social security system and these pressures are expected to increase further in the years ahead. The government has been increasingly concerned about this problem in recent years and has tried to shift some of the costs of the social security system back to the families. In business circles, entrepreneurs have been concerned about the recent declining trends in the labor force and saving rates. Labor force and saving trends in the recent past, taken together, suggest that Japan's

economy is likely to grow more slowly in the future than it did during much of the post-war period.

This paper analyses the impact of rapid population aging on the socioeconomic system in Japan during the late 20th century and 21st century. Although the scope of this paper is confined largely to the Japanese context, Japanese experiences of population aging and policy responses are useful as a baseline for discussing important public policy issues related to population aging in other Asian countries. It should be borne in mind that despite its fast economic development, Japan has still retained some of its traditional values relating to familial responsibilities, so that the Japanese model may be of relevance to policy makers in Asia's developing region interested in combining the best of traditional and modern approaches to support the elderly.

In the next few sections, we will discuss Japanese experiences of population aging and their socioeconomic consequences over the past few decades. In a subsequent section, we will describe how and to what extent the pattern of intergenerational public and familial transfers has been changing over the last two decades in response to population aging, by employing a new analytical tool called the "National Transfer Account (NTA)" system. NTA can be utilized as a useful base for researchers and policy makers in searching for effective public policies to cope with problems arising from population aging.

Rapidly Aging and Declining Population in Japan

Japan's fertility transition commenced in the early part of the 20th century. Although the tempo of fertility reduction was gradual, it became extremely dramatic

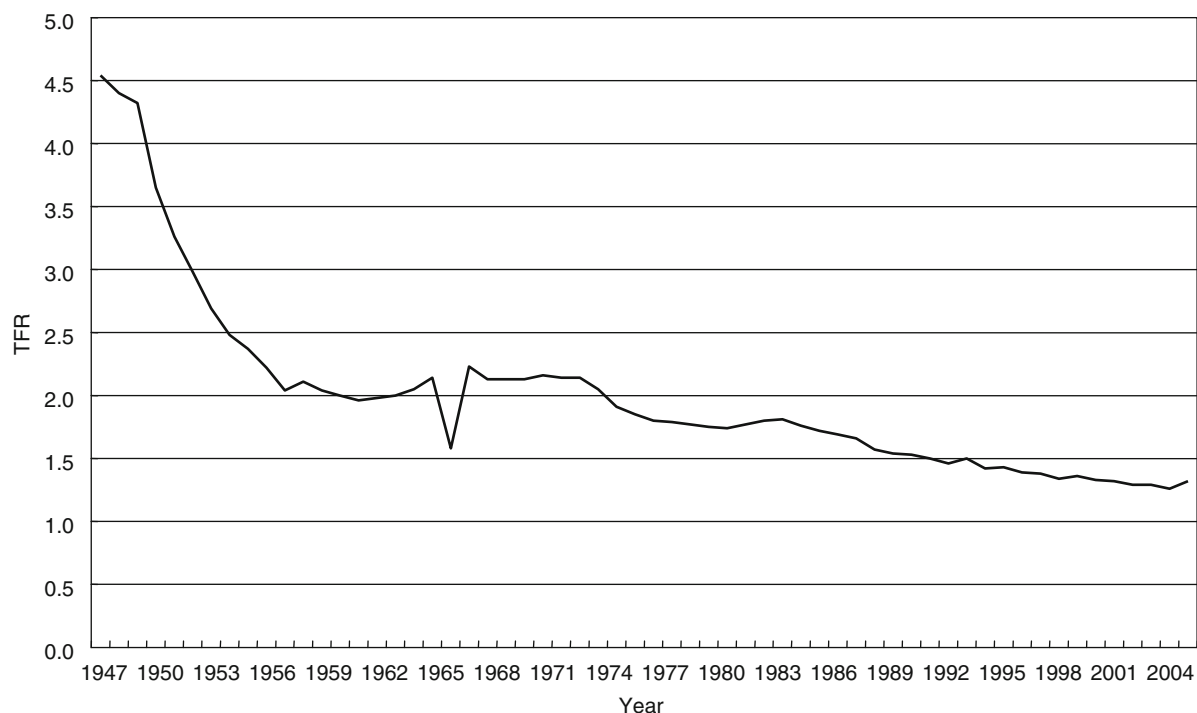
N. Ogawa (✉)
Population Research Institute
Advanced Research Institute for the Sciences and Humanities
Nihon University
Chiyoda-ku, Tokyo 101-8360, Japan
E-mail: ogawa.naohiro@nihon-u.ac.jp

immediately after the close of World War II (Hodge and Ogawa 1991). Subsequent to its short baby boom period (1947–1949), Japan's total fertility rate (TFR) declined by more than 50 per cent, from 4.54 to 2.04 children per woman, between 1947 and 1957. This 50 per cent reduction of fertility over the 10-year period is the first such experience in the history of mankind. This unprecedented decline of fertility resulted in a shift of personal resource allocation away from child-rearing and induced a rapid accumulation of physical capital in the 1950s, which provided a strong base for achieving Japan's phenomenal economic growth in the 1960s (Mason and Ogawa 2001; Ogawa et al. 2005). For instance, Japan's per capita GNP for 1950 was only US\$153, which was lower than that of Mexico (US\$181) and the Philippines (US\$172). By 1968, the size of GNP for Japan had become the second largest in the developed world, following the United States.

In 1973, however, after the first oil crisis hit the Japanese economy, its economic growth pace slowed substantially. In parallel with this considerable change in the pace of economic growth, Japan's fertility level started to fall again, as presented in Fig. 7.1. By the

mid-1990s, its TFR declined below 1.5 children per women and the value of TFR for 2005 was 1.26, lowest in postwar Japan, although it rebounded to 1.32 in 2006. The post-1973 decline is often referred to by some demographers as Japan's second demographic transition (Ogawa and Retherford 1993; Retherford and Ogawa 2006).

Both inside and outside Japan, a great deal of attention has been paid to its recent very low fertility. In contrast, however, a relatively limited amount of attention has been paid to the unprecedented rapidity with which its mortality transition has been under way over the past several decades. In 1960, Japan's life expectancy at birth was 65.3 years for men and 70.2 years for women and these were the lowest life expectancies for each sex among any of the OECD member countries at that time (Mason and Ogawa 2001). By the mid-1970s, however, Japanese life expectancy was one of the highest among all the OECD members. In 2006, male life expectancy at birth reached 79.0 years to become the second highest in the world, following Iceland (79.4 years) and female life expectancy became 85.8 years, the highest in the world, followed by Hong Kong (84.6 years).



Source: Ministry of Health, Labour and Welfare, *Vital Statistics*, various years.

Fig. 7.1 Trends in the total fertility rate (TFR), Japan, 1947–2006

Moreover, between 1960 and 2006, life expectancy at age 65 grew to a substantial extent, from 11.6 to 18.5 years for men and from 14.1 to 23.4 years for women, which implies a marked increase in the retirement period and in the joint survival to older ages of both husbands and wives. In 2007, a Japanese man aged 111 was presented with a certificate from Britain's Guinness World Records for being the world's oldest man. At the same time, a Japanese woman aged 114 was listed as the world's oldest person. (Unfortunately, she passed away recently at the time of writing this paper.) It is also interesting to note that as a result of remarkably extended life expectancy, insurance companies in Japan have recently made their first major revisions in premium payments in 11 years.

In Fig. 7.2, the data on the average age of the 100 oldest deaths in each year over the period 1950–2004 are plotted separately for men and women. It is worthwhile to note that the average age of the 100 oldest deaths increased substantially over the second half of the 20th century for both sexes. More importantly, the plotted average age trends of the 100 oldest deaths indicate that the tempo of life prolongation has been considerably faster for both sexes since the early 1970s when the medical care programs were substantially upgraded.

Also, it should be noted that Japan is now at the fourth stage of the epidemiological transition, the stage in which the onset of degenerative disease is delayed. At present, three degenerative diseases, i.e., cancer, heart disease and cerebrovascular disease, are the major sources of mortality. Unlike many developed

countries where heart disease is the number one killer, cancer has been the leading cause of death in Japan since 1981. As a consequence of the diversification of dietary patterns, the intake of salt has been declining over time, which has, in turn, reduced the incidence of stomach cancer. Despite the fact that the decline in the intake of salt has also been contributing to the reduction of the incidence of cerebrovascular disease, Japan still has one of the highest death rates from cerebrovascular disease among the industrialized nations. It is often the case that elderly survivors from this disease tend to be paralyzed to a certain degree, which partially accounts for Japan's wide prevalence of bedridden cases.

As a consequence of these demographic transformations, the age structure of the Japanese population has been shifting to a pronounced degree. The proportion of those aged 65 and over increased from 5 per cent in 1950 to 20 per cent in 2005, making Japan's population the oldest national population in the world in 2005. In addition, the size of Japan's population began declining from the end of 2005. During the period from 2005 to 2006, the population diminished in 37 of the country's 47 prefectures. Among these 37 prefectures, Akita prefecture, the main economic activity of which is predominantly agriculture, posted the highest population decline rate, at 1.02 per cent, recording the fastest pace for eight consecutive years. In contrast, Aichi, which is a largely industrialized prefecture, saw the highest rate of increase in the whole nation, at 0.74 per cent.

What does Japan's population prospect look like for the next few decades? A population projection

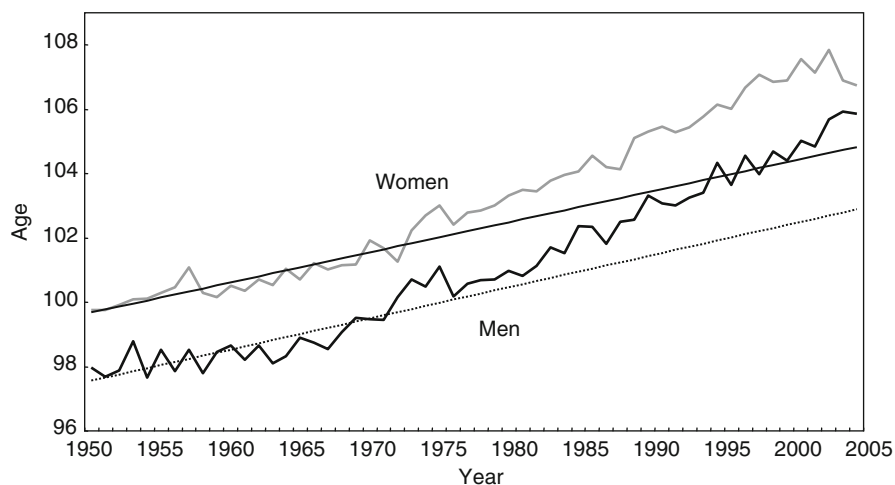


Fig. 7.2 Change in the average age of death among 100 oldest persons in Japan, by sex, 1950–2005

Source: Ministry of Health, Labour and Welfare, *Vital Statistics*, various years.

produced from the most recent version of the population-economic-social security model constructed by the Nihon University Population Research Institute (NUPRI) shows a few points of interest. Since a detailed description of the NUPRI population projection has been provided elsewhere (Ogawa et al. 2003), no further methodological discussion pertaining to the derivation of the projection will be given here.

First, the proportion of those 65 and over is expected to increase from 20 per cent in 2005 to 31 per cent in 2025, which suggests that Japan's population is very likely to continue to be the world's oldest national population for the next twenty years.

Second, more importantly, the Japanese population will reach the world's highest level of aging at an unprecedented rate, as discussed elsewhere (Ogawa and Retherford 1997; Ogawa et al. 2003). Japan's aged population reached the 10 per cent level in 1984 and was the last to do so among all the industrialized nations. Despite this delayed onset, Japan is the first country among all the industrialized nations in which the aged comprise more than 20 per cent of the total population. The length of time required for the increase from 10 to 20 per cent was only 21 years. Compared with such European countries as Sweden and Norway, Japan is aging at a tempo approximately three times as fast.

Third, the proportion of those aged 75 and over in the population aged 65 and over is expected to grow rapidly over the entire projected period. It is projected to rise from 40.9 per cent in 2000 to 59.6 per cent in 2025. A close examination of this projected result and country-specific data produced from the recent population projection prepared by the United Nations (2007) reveals that Japan's level for 2025 is likely to be by far the highest in the world, followed by Sweden (52.1 per cent) and Italy (51.8 per cent). This marked age compositional shift of the Japanese older population is likely to generate a substantial effect on the pattern and level of demand for medical care services.

Fourth, the familial support ratio, which relates the female population at ages 40–59 to the total population aged 65–84, is expected to decline substantially over the next 25 years. The value of this index was 1.30 in 1990 and is projected to be 0.65 in 2010, which means that it will decline by 50 per cent in just 20 years. These results indicate that the demographic potential of familial support by adult children for the elderly will diminish rapidly; starting from 2007 when

a large cohort glut of baby boomers disappears from the age group 40–59. The declining trend of the familial support ratio points to the high likelihood that the traditional extended family system will be continuously weakened over time. Although the government started the Long-term Care Insurance Scheme in 2000 to alleviate family members' burden in taking care of their frail elderly parents at home, the number of households without any caregivers is projected to rise at an astonishing rate so that the effectiveness of this new scheme is likely to become increasingly limited over time.

Economic Growth Performance and Labor Market Developments

As discussed above, Japan's postwar demographic transformations have been phenomenal but its economic growth is equally spectacular. At the end of World War II, the Japanese economy was severely damaged but its productive capacity recovered to the prewar level by the end of the 1950s. During the 1960s, Japan's real GDP grew at a phenomenal rate of about 11 per cent per annum. This rapid economic growth was facilitated by such factors as the use of abundant highquality labor, the borrowing of advanced technology from developed countries and the favorable international trade market (Ogawa et al. 1993). However, since the oil crisis in 1973, which triggered a series of changes for the restructuring of the Japanese economy, its economic growth performance has been much less impressive than that in the 1960s. In the face of this major change in its growth performance, Japan's average annual growth rate of real GDP for the 1980s was 4.2 per cent – still considerably higher than the figures for many other industrialized nations.

In the mid-1980s, the Japanese economy entered into the bubble economy phase. During this bubble period, many Japanese firms purchased numerous properties in the United States and elsewhere. This investment boom abruptly ended in the second half of 1990 and a number of leading banks and other financial institutions went into bankruptcy. Government tax revenues dropped dramatically and government debts accumulated at an unprecedented rate, reaching US\$8.3 trillion in 2007 or approximately 1.5 times the size of the country's GDP. Moreover, Japan's interna-

tional competitiveness deteriorated very quickly. In the early 1990s, the international competitiveness of the Japanese economy was ranked first but in 2007 it was ranked 24th, lagging behind Singapore ranked 2nd, Hong Kong 3rd and China 15th (IMD 2007). In addition, the household savings rate has been on a downward trend in recent years. In 2000, it was 7.9 per cent but declined to 3.1 per cent in 2005.

One of the major factors behind Japan's poor economic growth performance in the 1990s is a series of inappropriate macroeconomic policies implemented by the Japanese government after the bursting of the bubble. The Japanese government regarded Japan's sluggish economic performance as a part of a business cycle and increased government spending to boost the country's economy but without much success. It took the government several years to realize that more drastic economic restructuring policies were needed to make the Japanese economy more competitive in international markets. Because of such delayed government policy responses to globalization, some economists call the 1990s "Japan's lost decade" (Yoshikawa 2001). Only after early 2002 did the economy finally enter a period of slow but steady growth that has persisted until the present time, although the deflationary trend still continues.

In the 1990s, Japan's management style became no longer effective and numerous government regulations and restrictions were subjected to modification or abolition. In addition, Japan's unique lifetime employment practice and seniority-oriented wage system, both of which constitute the core of Japan's "corporate paternalism", became a serious stumbling block to making the Japanese economy more competitive. As mentioned in the previous section, since the late 1990s, a series of management restructuring adjustments has been introduced by a majority of business firms, which has, in turn, affected job security among their employees.

One of the principal obstacles to raising the mandatory retirement age is related to the practice of the seniority wage system, under which the postponement of retirement age leads to larger wage bills. In response to the aging of the work force, however, many businesses, particularly among largescale enterprises, have been gradually modifying the seniority-based wage system by introducing performance-based elements. The other deterrent to the extension of retirement age is related to the provision of lump-sum severance ben-

efits, which are basically a function of the duration of an employee's service. In 2005, a male employee with university education and more than 35 years of service received severance pay equivalent to 46 months' worth his/her final monthly salary. As is the case with the seniority remuneration system, the importance of this lump-sum severance pay program has recently fallen as a result of incorporating such grants into pension benefits provided by employers. In the recent past, however, the severance pay has attracted a great deal of attention in Japanese society, as the baby boom generation approaches its retirement age. In 2007, the first wave of Japan's 6.9 million baby boomers born between 1947 and 1949 have begun to retire and because of their sheer size, depending upon how they spend their severance pay, financial markets not only in Japan but also elsewhere are bound to be affected to a substantial degree. Many financial institutions, banks and life insurance companies are now offering a variety of portfolio plans to the retiring baby boomers.

Another serious problem associated with the exodus of a large number of baby boomers from the labor market is the loss of a giant pool of experienced workers. To mitigate the strain, employers are trying to keep the baby boomers on the payroll by implementing various measures. With declining fertility and lukewarm economic growth, the task is not easy.

In so far as the labor force participation rate among the elderly is concerned, Japan is set apart from other industrialized nations. In 2006, the labor force participation rate for elderly Japanese men was 29 per cent. In sharp contrast, the corresponding figure for the developed countries in Europe was below 10 per cent and was 18 per cent for the United States. Similarly, Japanese women are also more likely to continue working than older women in Europe and the United States.

Beside the elderly workers, Japanese young and middle-aged female workers have also been showing an interesting pattern of growth over time. The time-path of Japanese female labor force participation differs considerably from that of many industrialized nations. In most industrialized nations, the female labor force participation rate has risen sharply during the past few decades or so but in Japan the rate for women aged 15 and over fell from about 51 per cent in the mid-1960s to about 46 per cent in the mid-1970s and then rose to about 49 per cent in 2006 (Statistics Bureau 2007). The absence of any substantial trend in the Japanese female labor force participation rate during the past

few decades is the product of off-setting trends in different types of female labor force participation, as well as the sensitivity of female labor force participation to economic fluctuations such as the oil crisis of the early 1970s and the bursting of the bubble economy in the 1990s. The response of female labor force participation in Japan to such factors supports the frequently heard claim that Japanese female workers are marginal workers and that their wages are notoriously low.

It should be stressed, however, that apart from the bursting of the bubble economy, due to the diminishing supply of male workers in absolute terms from 1998, the demand for female workers as substitutes for their male counterparts, both full-time and part-time, has been on an upward trend since then, particularly in the service and retail/wholesale industries (Matsukura et al. 2007).

Changing Public and Familial Support Systems

In view of these demographic and economic trends in the past few decades, it is very likely that the Japanese social security system will face extremely serious long-run financial problems in the coming years.

In Japan, both universal pension and medical care schemes were instituted in 1961. Since then, Japan's social security system has grown remarkably. Between 1961 and 2002, social security benefits increased from 5 to 23 per cent of national income (Social Insurance Agency 2005).

Japan's social security system encompasses old-age pension schemes and medical plans, as well as the Long-term Care Insurance Scheme and some other smaller programs. The share of social security expenditures accounted for by the two main components has changed substantially over time. Pension benefits and medical benefits respectively accounted for 22 and 57 per cent of total expenditures in 1965 and 53 and 31 per cent of total expenditures in 2002 (Social Insurance Agency 2005). The major shift toward pension benefits has occurred mainly because of population aging, maturation of the pension system and major changes in medical plans intended to rein in mushrooming health care costs. Another reason is that pension benefits are more affected by population aging than medical benefits, inasmuch as

medical benefits are provided to the entire population regardless of age.

Public pension schemes were initially established for specific occupational groups, with some groups covered earlier than others. There are currently six different public pension schemes. Two of these, the Employees' Pension Scheme (EPS) and the National Pension Scheme (NPS), cover approximately 90 per cent of the work force. The EPS was established in 1941. The NPS was established in 1961 to cover workers not already covered by the other public pension schemes. Thus, 1961 marks the onset of universal pension coverage for workers in Japan.

A major difference between the EPS and the NPS is that paid employees working for a firm with at least five regular workers belong to the EPS, whereas farmers, other selfemployed workers, employees of small firms with less than five regular workers and certain other categories belong to the NPS. The two schemes also differ in levels and methods of contribution. In the EPS in 2007, 14.996 per cent of a worker's total annual earnings including bonuses was contributed to the government, evenly split between the employee and the employer. In the NPS, the government collects a flat contribution from the members, most of whom are self-employed. In 2007, this contribution was 14,140 yen (about US\$125) per month. Because of lower contributions, benefits paid to NPS recipients are considerably lower than those paid by the EPS. In both the NPS and the EPS, benefits have been automatically linked to changes in the consumer price index only since 1999.

When Japanese pension schemes were initially established, they were organized under the principle of reserve financing. As the social security system evolved, however, the reserves accumulated turned out to be insufficient to cover current benefit payouts, thus requiring the government to shift away from reserve financing toward pay-as-you-go financing by gradually increasing subsidies from general tax revenues. Unlike reserve financing, pay-as-you-go financing is directly affected by the age composition of the population. The reserve funds accumulated in the past have been diminishing very quickly in recent years as the proportion of the elderly population has increased. EPS' reserve funds are a salient example. Moreover, various calculations have shown that intergenerational equity considerations will become an increasingly divisive social issue as population aging accelerates in Japan during

the next few decades (Ogawa and Retherford 1997). Mainly due to such gloomy long-term prospects, an increasing proportion of the population enrolled in the NPS is discontinuing contributions: 35 per cent of the participants did so in 2007. (In the case of Okinawa prefecture, which is the worst among all the prefectures in Japan, 56 per cent of the participants are not making contributions to the NPS at the present moment.)

In order to maintain financial solvency, Japan's pension schemes have been periodically reviewed and reformed. In 2004, one of the major pension reforms was carried out. One of the primary objectives of the 2004 pension reform was to address the sustainability of pension schemes, which meant the reduction of benefits to a considerable extent. As a result, the replacement rate for the EPS declined considerably. According to OECD's computation, it is currently 59.1 per cent of the average earnings of a male worker and is lower than the average of those for the OECD member countries, which is 68.7 per cent (OECD 2005a).

In 2007, the government's careless handling of pension records, which has been under way for a few decades, became a serious political issue. It is estimated that pension records for more than 50 million pension contributors cannot be identified, mainly due to the fact that incredibly many errors were committed in the process of converting original hand-written documents to a computer format. Because there are millions of elderly persons who cannot receive pension benefits, Japan's public pensions system will be drastically changed, depending on how this political issue is settled in the near future.

The second major component of social security benefits are medical benefits. Five separate major plans exist and coverage by one or another has been universal since 1961. The Association-managed Health Insurance Plan (AHIP), the Government-managed Health Insurance Plan (GHIP) and the National Health Insurance Plan (NHIP) are the three major plans and together they cover 87 per cent of the population. Employees of largescale enterprises are enrolled in the AHIP and employees of small or mediumsized businesses are enrolled in the GHIP. Persons not covered by other plans are enrolled in the NHIP. The age structure of members is older in the NHIP than in the other plans, primarily because a large proportion of NHIP members are self-employed small business owners and farmers.

In 2005, the medical plan premium was as high as 8.2 per cent of a worker's earnings for both the AHIP and GHIP (Health and Welfare Statistics Association 2005). The premium is split between the employee and the employer and the government provides small subsidies to cover administrative and management costs. In the case of the NHIP, a different premium amount is collected from each household, depending on its annual income and assets.

Because of the NHIP's lower premium rates and older age composition, the financial foundation of this plan, compared with the other four plans, is weak and has required heavy government subsidies. To ease the financial burden on the government, the other four medical plans for employees have been required to make contributions to the NHIP since 1984, to compensate for differences in age composition between the plans. As a consequence, the financial situation of the AHIP, which has the youngest age composition, has been deteriorating rapidly. Various proposals to integrate the five plans into one unified plan are currently under discussion.

At present, Japan's ratio of social security benefits to its national income is still lower than that of most of the European countries, but numerous simulation exercises currently available suggest that it will grow considerably over the next few decades. How much will Japanese taxpayers be required to contribute to the social security system over the next 25 years? The Japanese government has been very concerned about this issue and has been trying to shift some of the costs of the social security system back to the families.

Although Japan's current demographic and economic situations are similar in many ways to those of other industrialized countries, there are also some important differences that relate to the legal status of the elderly and family organization (Hodge and Ogawa 1991; Ogawa and Retherford 1993, 1997).

Let us first discuss the legal status of the elderly. Most industrialized nations, particularly in Europe, have already abolished legal requirements for providing care to needy parents (Hashimoto 1984; Gibson 1992). In Japan, the responsibility of children for taking care of their aged parents is stated in the new Civil Code of 1948. Article 877 of the new Civil Code stipulates that those who are in a lineal relation as well as siblings are responsible for supporting and caring for each other. Under special circumstances, relatives within the third degree may also be required to fur-

nish support. This legal family responsibility is often invoked and enforced (Gibson 1992); in 1995 there were 112 legal cases of this nature involving those aged 65 and over (Supreme Court 1996).

The legal status of the elderly is more firmly protected in contemporary Japanese society than in other industrialized countries but it was even more strongly established in prewar Japan. The old Civil Code, which was heavily tinged with Confucian beliefs, included the legal sanctions behind the primary power of family heads over arranged marriages and primogeniture inheritance (Kendig 1989). These legal sanctions provided a powerful base for reinforcing traditional family relations based upon extremely intense obligations between individuals in direct lineal descent (Sano 1958). In the old Civil Code, therefore, primacy was given to the continuity of the household with successive generations of parents, eldest sons and their wives and children. In such a patrilocal household, the son and his wife held a subordinate position to his parents. In addition, these traditional family values were further reinforced by a shame culture involving a deep sensitivity to social approval, a strong motivation throughout life to relieve oneself of the great burden of carrying indebtedness to others and the absolute duties to parents (Benedict 1946). In postwar Japan, however, revisions of the Civil Code in 1948, which closely followed the conjugal family system in the West, removed the predominant legal power of family heads. Apparently, these legal revisions were designed to reshape traditional culture to better fit in with a more modern social structure consonant with individual rights and economic progress (Kendig 1989). Nevertheless, Japan's traditional family values and practices are still widely prevalent in various social aspects, though they have been changing pronouncedly in the last few decades as a consequence of rapid urbanization and industrialization, coupled with an extraordinarily fast demographic transition. Such changes have been directly reflected by the family structural transformation in postwar Japan, as will be revealed next.

Let us now discuss Japan's changing family organization. Unlike the Western European countries, multigenerational households are still fairly common in Japan, though they are not the most common living arrangement and their proportion shows a secular decline (Ogawa and Ermisch 1996). According to the 2001 round of the International Survey of Lifestyles and Attitudes of the Elderly (Cabinet Office 2002),

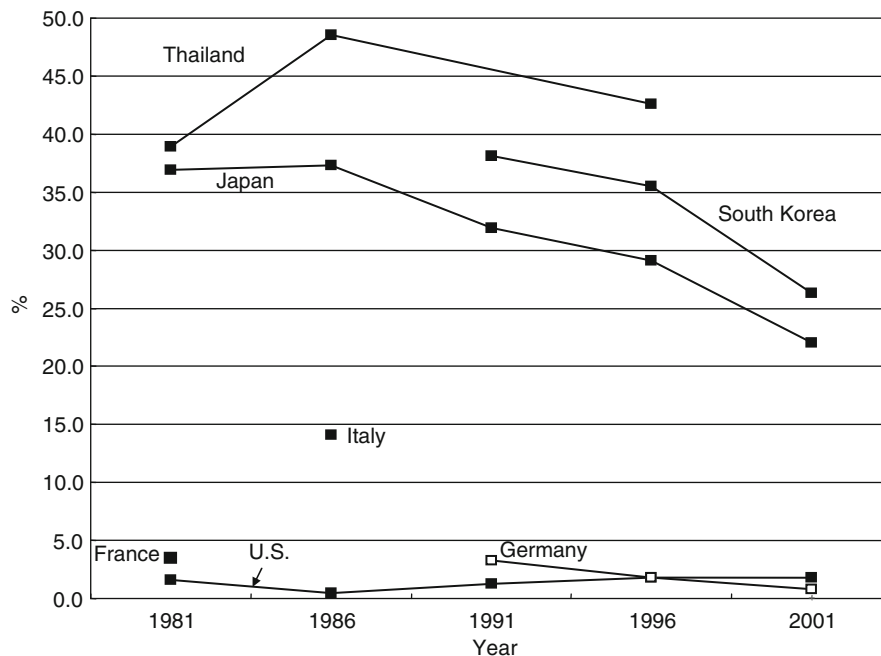
the proportion of the elderly at ages 60 and over living in three-generation households in Japan was 22 per cent. By contrast, corresponding figures indicated only 2 per cent in the United States, 1 per cent in Germany and virtually 0 per cent in Sweden. It should be stressed, however, that due to rapid demographic shifts as well as changing lifestyles, the figure for Japan has been steadily declining over the past two decades, as depicted in Fig. 7.3; it was 37 per cent in 1981 and 32 per cent in 1991. Although the Japanese government often views the persistence of coresident households as a unique asset that could be tapped to offset the adverse effects of population aging on the sustainability of the social security system, the validity of this view has become increasingly questionable as the process of population aging advances.

Another piece of evidence demonstrating the declining trend of multigenerational households is the decline in the proportion of newly married couples who coreside with parents. Between 1955 and 2002, the proportion of newly married couples who coresided with parents fell from 64 to 29 per cent, as shown in Fig. 7.4.

However, as the aging process advances, elderly patients who need intensive nursing are expected to increase at an alarming rate. Using the NUPRI model, we estimated the number of those aged 65 and over who are bedridden or suffer from senile dementia for the next 25 years, by assuming that the age-sex-specific pattern of the incidence of being each type of patient remains unchanged throughout the projected period. The number of bedridden patients, either at home or at medical institutions, will grow by 2.2 times, i.e., from 1.25 million in 2000 to 2.70 million in 2025. The total number of senile dementia cases will increase by 2.4 times from 1.64 to 3.99 million during the corresponding period.

A substantial proportion of these elderly patients has been and will be looked after at home by their adult children, particularly non-working middle-aged women. With this family support pattern in mind, we have projected the ratio of elderly patients at home to women at various ages outside the labor force. To facilitate this computation, it has been assumed that the current age sex distribution of female caregivers at home will remain constant in the future. Moreover, the number of non-working women at varying ages has been calculated by multiplying the age-specific female population by $(1-FLFPR)$, where FLFPR stands for

Fig. 7.3 Changes in the proportion of 60+ living in three-generational households, selected countries, 1981–2001



Management and Coordination Agency, *Brief Summary of the International Comparative Survey of the Elderly*, various years, Tokyo.

the female labor force participation rate for the corresponding age group; both of these population and economic variables have been derived from the economic submodel of the NUPRI model. The ratios have been computed for the following six age groups: 20–29, 30–39, 40–49, 50–59, 60–69 and 70 and over.

The estimated results are shown in Fig. 7.5. As indicated, the ratios of the aged population at home suffering from senile dementia or being bedridden to women

outside the labor force grow over time for all age groups. Although the differences in the ratios among these age groups are very small in the early years, they expand markedly over time. Furthermore, non-working women in their 40s consistently show the highest ratio throughout the projection period. Approximately one out of every seven women aged 40–49 assumes responsibility for taking care of one infirm elderly person at home in 2000 but almost 50 per cent of the

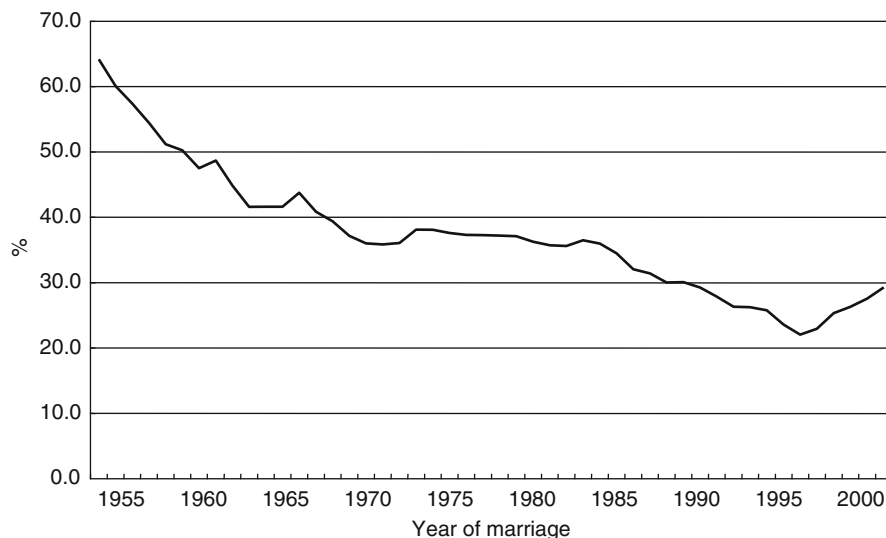
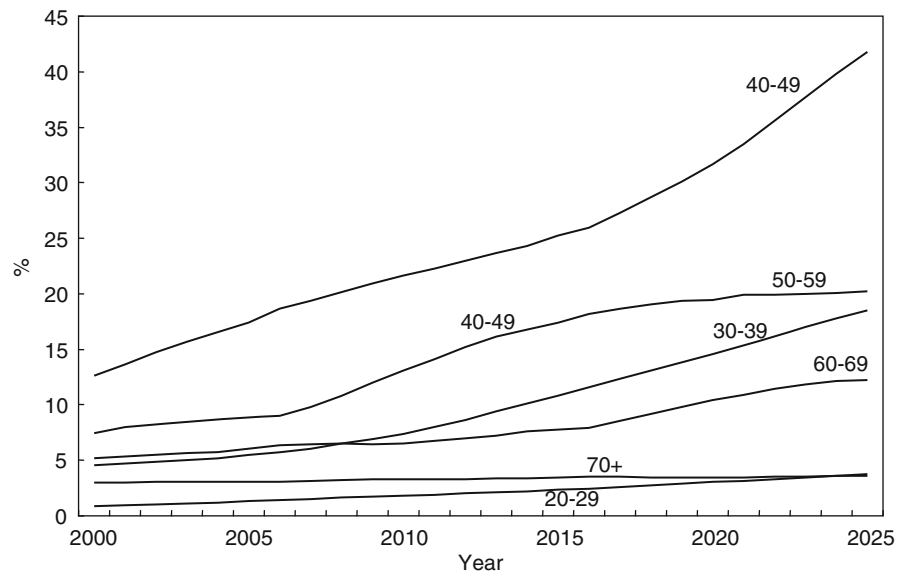


Fig. 7.4 The proportion of newly-married couples who coresided with parents, Japan, 1955–2002

Fig. 7.5 Projected ratio of the elderly population who suffer from senile dementia or who are bedridden to the non-working population at various ages, Japan 2000–2025



Source: Calculated by the authors using the NUPRI long-term macroeconomic-demographic-social security model.

non-working women of this age group are likely to provide inhome care to elderly patients in 2025. These differences over time, in the pattern of increase in the computed ratios among the six age groups, are attributable to changes in their labor force participation rates as well as in their cohort size.

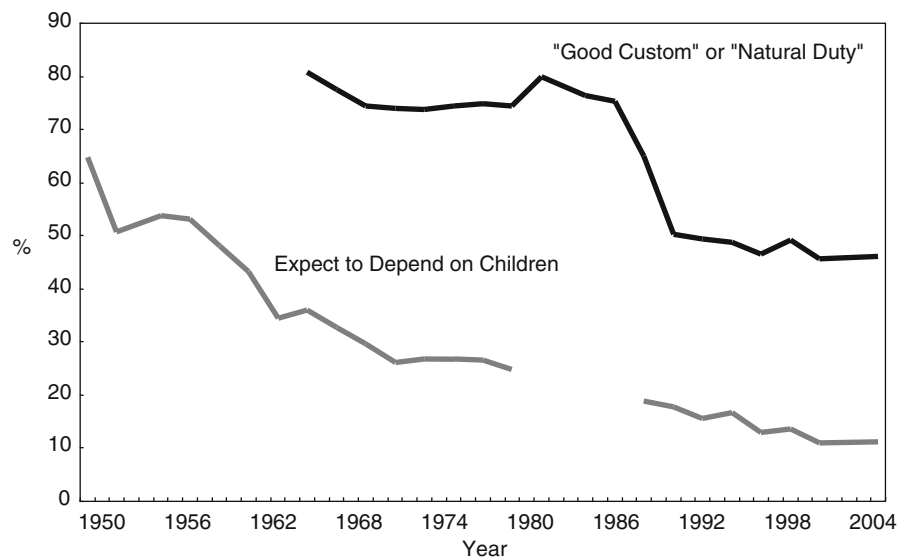
The above computational results point to a dramatic rise in the burden placed upon middle-aged Japanese women providing inhome nursing for the infirm elderly. These results are likely to change drastically, depending upon the future availability of both (i) public support services through social security programs such as the Long-term Care Insurance Scheme and (ii) longterm care institutions. The degree to which care for elderly patients is internalized through Japan's traditional familial support network is also contingent upon the magnitude of future demand for female labor and upon the commitment of future cohorts of women to care for their elderly kin with serious infirmity or illness at home. In view of the financial constraints on the part of the government, the recent trend for female paid employment (Ogawa and Clark 1995; Ogawa and Ermisch 1996; Ermisch and Ogawa 1994) and the rapid filial normative shift (Ogawa and Retherford 1993; Retherford et al. 1999), the financial and manpower outlook for providing care for Japanese infirm elderly is rather negative.

Furthermore, the assumption that the Japanese middle-aged women will continue to play the role of

caregivers for their elderly parents in the future will be increasingly questionable, as documented by time-series data, gathered in a series of nationwide surveys concerning fertility and family planning, which have been carried out every other year since 1950 by the Mainichi Newspaper (Population Problems Research Council 2004). Since the first round of the survey, with the exception of a few rounds, a question regarding the dependence on children for old-age security has been asked to married women of reproductive age who have at least one child. The precoded responses are as follows: (i) "expect to depend," (ii) "do not expect" and (iii) "never thought about it." Figure 7.6 shows intertemporal changes over the period 1950–2004 in the percentage of the respondents who chose the category, "expect to depend." The proportion of respondents who expect to depend on their own children declined almost continuously over the period in question. Almost two-thirds of Japanese married women in 1950 expressed an expectation to depend on their own children but only 11 per cent in 2004 intended to depend on their own children for old-age security.

Since 1963, a question about the attitude of wives toward taking care of aged parents has been asked in the successive rounds of the Mainichi Newspaper's surveys. The precoded response categories are as follows: (i) "good custom," (ii) "natural duty as children," (iii) "unavoidable due to inadequacy of public support resources" and (iv) "not a good custom." Figure 7.6

Fig. 7.6 Trends in changing norms and expectations, married women of reproductive age, Japan, 1950–2004



Source: Mainichi Newspapers of Japan, *National Survey on Family Planning*, various years. Mainichi Newspaper of Japan, *The first round of the National Survey on Population, Families and Generations, 2004*.

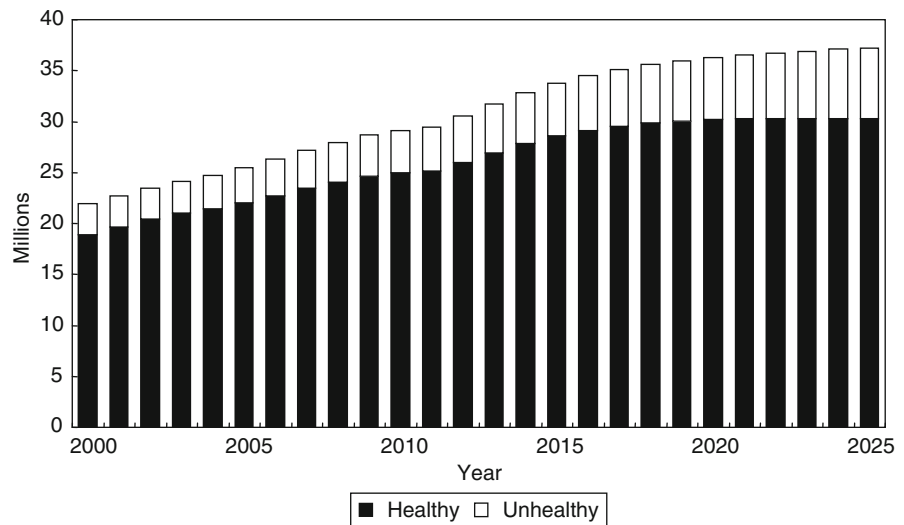
presents changes in the percentage of those who chose one of the first two response categories: (i) “good custom” and (ii) “natural duty as children.” The plotted results indicate that the proportion of respondents who felt that providing care for elderly parents was either a good custom or natural duty had been, by and large, stable over the period 1963–1986. From 1986 to 1988, however, the percentage distribution changed dramatically and the declining trend is still under way. The timing of this abrupt change in married women’s attitudes toward their elderly parents coincided with a host of changes in the public policies with regard to the provision of long-term care to frail elderly persons, namely shifting responsibilities from government to families (Ogawa and Retherford 1997).

There is, however, one important finding derived from the newest version of the NUPRI model, where we have also estimated the proportion of the elderly who are healthy and the proportion of those not healthy. With a view to estimating the number of elderly persons aged 65 and over by health status, we have first analyzed micro-level data gathered from the first two rounds of the Nihon University Japan Longitudinal Study of Aging (NUJLSOA). The NUJLSOA is designed to be comparable in many respects with the United States Longitudinal Study of Aging. The first round of the NUJLSOA was conducted in November 1999. The initial sample size in the first wave of the survey amounted to 6,700

persons aged 65 and over. Proxy respondents were allowed to answer questions in cases where the original respondent was not competent enough to answer questions or not available at the time of the interview. The total number of completed interviews is 4,997 but persons aged 75 and over were over-sampled by a factor of two. When analyzing the data, therefore, weights need to be used so that the observations in the sample are representative of the Japanese population at ages 65 and over. Despite strenuous efforts to include institutionalized persons in the NUJLSOA, such persons remain underrepresented in the survey. The second wave of the survey was conducted in November 2001, with a sample size of 4,621 persons, including 631 new respondents added to the sample.

To project the number of elderly persons by health status, their health status has been defined in the following manner: if a respondent does not have any difficulties in performing all seven ADLs and all seven IADLs at the time of the survey, he/she is considered to be healthy/active. On the other hand, if the respondent is unable to perform even one ADL or IADL, he/she is considered to be unhealthy/inactive. The seven ADLs include bathing, dressing, eating, transferring from/to bed/chair, walking inside a house, going outside and toileting. The seven IADLs consist in preparing own meals, shopping for personal items, managing money, making a phone call, doing light house work, going

Fig. 7.7 Projected elderly population by health status, Japan 2000–2025 (based on health status transition rates)



out alone by using public transportation and taking medication.

By applying data gleaned from the two rounds of the longitudinal survey to the multistate method called “IMaCh” (Lievre and Brouard 2003), Lievre and Saito (2005) have estimated annual transition probabilities among the following three states: healthy/active, unhealthy/inactive and dead. By incorporating these calculated results by age and sex in the newest version of the NUPRI model, we have projected the number of healthy/active elderly persons and the number of unhealthy/inactive elderly persons over the period 2000–2025. It should be noted, however, that the computed transition rates have been assumed to remain unchanged throughout the projected period. Moreover, although we have attempted to include the education variable as one of the covariates, it has turned out to be statistically insignificant, which is why we dropped it from our numerical experiments.

Figure 7.7 depicts the changing composition of the elderly population aged 65 and over by health status. As can be seen from Fig. 7.7, the proportion of the elderly population who are unhealthy/inactive is projected to marginally increase from 14 per cent to 19 per cent over the projected period. However, the number of the healthy/active elderly persons is projected to increase substantially from 19 million in 2000 to 30 million in 2025. These projected results suggest that Japan’s productive capacity might expand considerably in the years to come if these healthy/active elderly persons could participate in the work force and be gainfully employed.

These demographic and socioeconomic transformations in postwar Japan have been affecting the pattern and mode of intergenerational transfers over time. Before proceeding to a few analyses of intergenerational public and private transfers, we will describe a brief outline of the newly-developed analytical tool, namely, the National Transfer Accounts (NTA).

A Brief Description of the National Transfer Accounts

Over the past several years, an international collaborative research project has been conducted, with a major goal of developing the National Transfer Accounts (NTA), which is a system for measuring economic flows across age groups. These flows arise because dependent members of the population are supported by members of the population who produce more than they consume. Societies take different approaches to reallocating resources from surplus to deficit ages but two methods dominate. One method relies on capital markets. Individuals accumulate capital during their working ages. When they are no longer productive, the elderly can support their consumption by relying on capital income (interest, dividends, rental income, profits, etc.) and by liquidating their assets. The second method relies on transfers from those at surplus ages to those at deficit ages. Some transfers are mediated by the public sector. Important examples are public education, publicly financed healthcare and public

pension programs. Many transfers are private transfers of which familial transfers are most important. The material needs of children are provided mostly by their parents. As has been previously pointed out elsewhere (Ogawa 2003), in Asian societies familial transfers between adult children and the elderly are also very important. Some of these transfers are between households but intra-household transfers are much more important.

The National Transfer Accounts provide a comprehensive framework for estimating consumption, production and resource reallocations by age. The accounts are constructed so as to be consistent with and complementary to the National Income and Product Accounts. The accounts are being constructed with sufficient historical depth to allow for analysis of key features of the transfer system. Sectoral disaggregation allows the analysis of public and private education and healthcare spending. The accounts can also be projected to analyze the economic and policy implications of future demographic transformations.

The NTA system will provide important new information relevant to the following issues:

- (i) *Intergenerational Equity and Poverty.* How resources are shared across generations is one of the most important determinants of equity and poverty. Children and the elderly are most vulnerable because their responses to economic hardship are so limited. The NTA system measures how consumption varies across generations and will allow for international comparisons currently not possible.
- (ii) *Aging Policy.* Many Asian countries face the prospect of rapid population aging. They are developing new programs and considering reforms of old programs intended to meet vital needs of the elderly without undue sacrifice on the part of other generations now and in the future. The NTA system will provide the information base needed to evaluate alternative policies, to assess their effects on intergenerational equity and their implications for economic growth.
- (iii) *The First Demographic Dividend.* The first demographic dividend arises because changes in population age structure have led to an increase in the working ages relative to the non-working ages. To be more precise the first demographic dividend arises because of an increase in the share of

the population at ages during which production exceeds consumption.

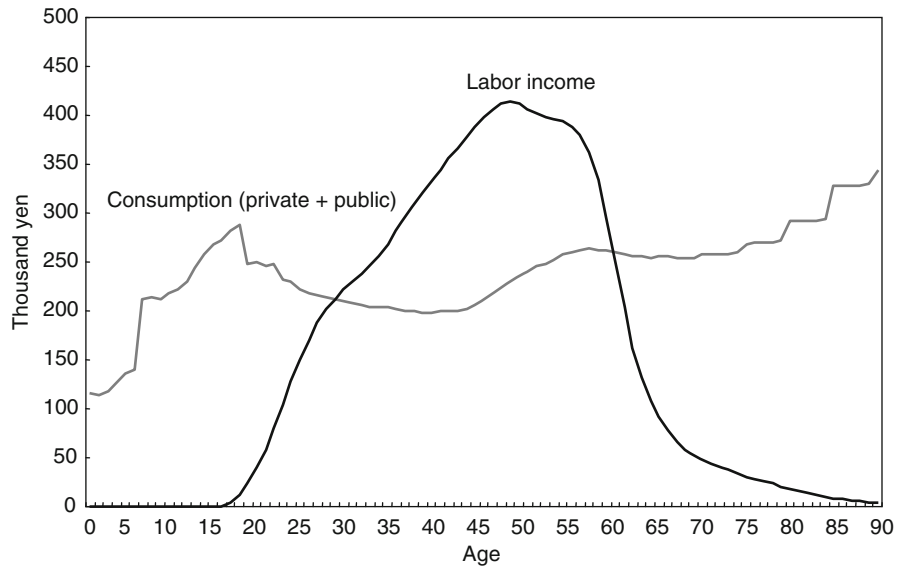
- (iv) *The Second Demographic Dividend.* The second demographic dividend arises in response to the prospect of population aging. In countries that rely on capital accumulation to meet the retirement needs of the elderly, population aging provides a powerful incentive to accumulate wealth. This phenomenon has been important to the economic success of East Asia's high-performing economies. In countries that rely on transfers to meet the retirement needs of the elderly, the second demographic dividend may not emerge.
- (v) *Childbearing Incentives.* Countries vary with respect to the cost of children and the extent to which those costs are borne by parents. The NTA system provides estimates of the cost of children and the extent to which those costs are subsidized by the public sector. This information may be useful for understanding why high fertility persists in some countries and why very low fertility persists in others.

In the remaining part of the present paper, we will analyze some of these issues by presenting some of the principal findings recently produced by the NTA project for Japan. Moreover, we will compare them with some preliminary findings for other selected Asian countries.

Measuring First and Second Demographic Dividends

One of the important linkages between demographic transformations and economic growth is the role of demographic dividends in the process of economic development (Mason 2001, 2005; Mason and Lee 2005). With a view to calculating the first demographic dividend for Japan, we have estimated the age-specific profiles of consumption with both private and public sectors combined and those of production in contemporary Japan. The estimated results are presented in Fig. 7.8. These profiles have been depicted, by drawing upon private-sector information derived from the *National Survey of Family Income and Expenditure* (NSFIE) for 2004 carried out by the Statistics Bureau of Japan and public-sector information for 2004 gleaned

Fig. 7.8 Monthly per capita production and consumption in 2004



from various government publications. By applying the computed age-specific results displayed in this graphical exposition as statistical weights to adjust the entire population over the period 1920–2025, we have calculated the annual growth rate of output per effective consumer and the annual growth rate of output per effective producer over the period 1920–2025. The computed results are shown in Fig. 7.9. A brief glance at these results reveals that Japan’s first demographic dividend, which corresponds to the difference between the annual growth rate of output per effective consumer and the annual growth rate of output per effective producer, had been positive for 46 years

from 1950 to 1996. The magnitude of the positive first demographic dividend was extremely large during the rapid economic growth of the 1960s and the early 1970s, as discussed in the earlier section.

As has been the case with postwar Japan, the first demographic dividend typically lasts for a few decades but it is, nonetheless, inherently transitory in nature. The same demographic forces that produce an end to the first dividend lead to a second demographic dividend. That is, in the process of age structural transformations, the second dividend arises in response to the prospect of population aging. While the first dividend is purely accounting-oriented, the second dividend

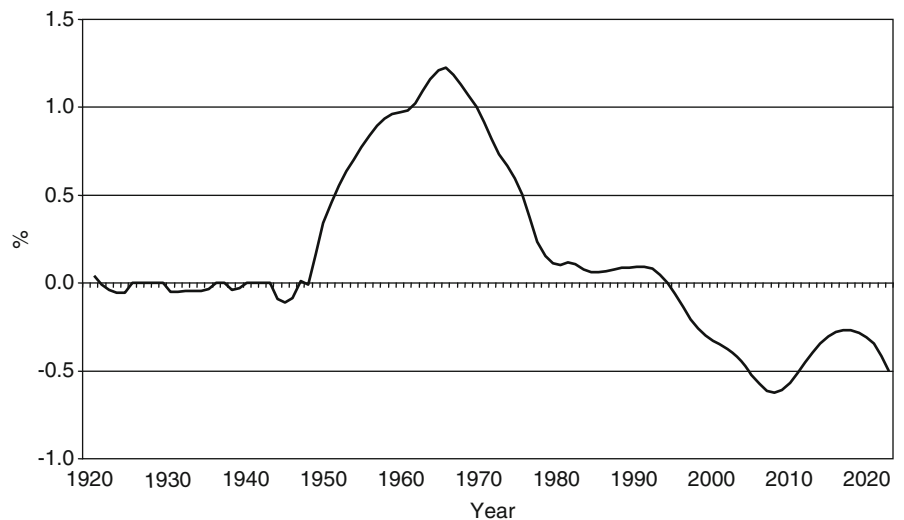


Fig. 7.9 Trend in first demographic dividend in Japan, 1920–2025

consists in both compositional and behavioral effects (Mason 2005; Ogawa and Matsukura 2007). The second dividend is affected not only by the numbers of the elderly persons relative to younger persons but also by the extent to which consumers and policy makers are forward-looking and respond effectively to the demographic changes that are anticipated in the years ahead. When life expectancy is increasing, for example, the impetus for accumulating wealth is stimulated, which, in turn, leads to a permanent increase in income. This implies that if capital accumulation rather than familial or public transfer programs dominate the age reallocation systems for supporting the elderly, population aging may yield a second demographic dividend in the form of higher rates of saving and capital intensification of the economy (Mason 2005).

Compared with the first dividend, measuring the amount of the second dividend is considerably more difficult, in part because the accumulation of wealth is intrinsically forward looking. In the present study, we have followed previous studies (Mason 2005).

The estimates of the second demographic dividend over the period 1950–2050 are shown in Fig. 7.10. Japan's second demographic dividend increases remarkably in the 1960s and 1970s and remains at a considerably high level for the latter half of the twentieth century. One salient example of the rapid increase in wealth in the early 1960s was the establishment of the universal pension plans, the reserved funds of which have accumulated at a phenomenal rate. Furthermore, beginning from the 1990s, the amount of the second demographic dividend fluctuates to a considerable extent, with a pronounced trough in the 2010s,

followed by a considerable upsurge in the 2020s and 2030s. These oscillations are substantially attributable to the rapid age compositional shifts in the early part of the twenty-first century, primarily because the second generation of baby boomers enters the age group 50 years old and over, in which they are expected to commence accumulating wealth for their long retirement life.

Moreover, by applying the age profiles of consumption and labor income for Thailand in 2001, the Republic of Korea in 2000, India in 2000, Indonesia in 1996 and the Philippines in 1999 to the 2004 United Nations' population projection for these Asian countries, we have computed the timing of both first and second demographic dividends for the four Asian countries. In addition, by applying Japan's age profile for 2004 to Malaysia and Singapore, we have calculated both dividends for these two additional countries. The results for the two dividends in the seven Asian countries are presented in Fig. 7.11 (for the first dividend) and Fig. 7.12 (for the second dividend). It can be easily seen from Fig. 7.11 that due to the differences in the timing of fertility reduction in these countries, the timing of the first demographic dividend differs considerably from one country to another: the Republic of Korea (1968–2014), Singapore (1969–2005), Malaysia (1970–2043), Thailand (1971–2018), India (1976–2045), the Philippines (1972–2043) and Indonesia (1976–2030).

It should be stressed that the duration of the first demographic dividend is relatively short in many Asian cases. For this reason, Asia's developing countries that are expected to enjoy the first demographic dividend

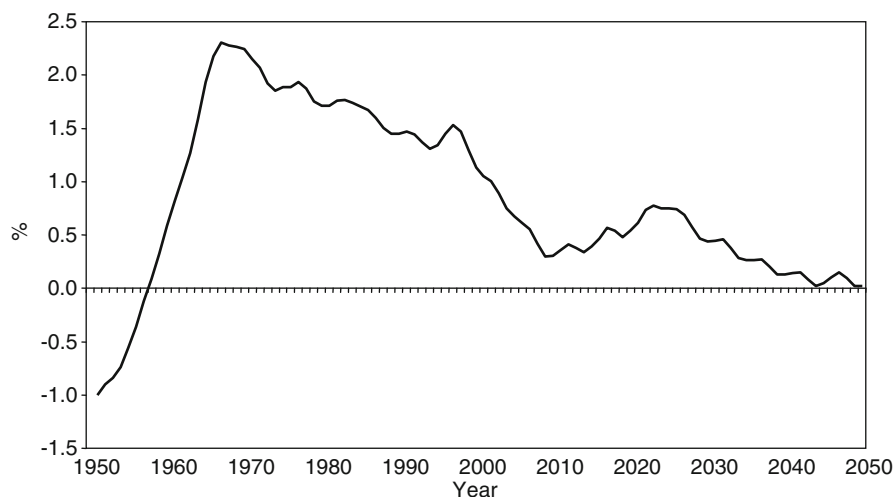
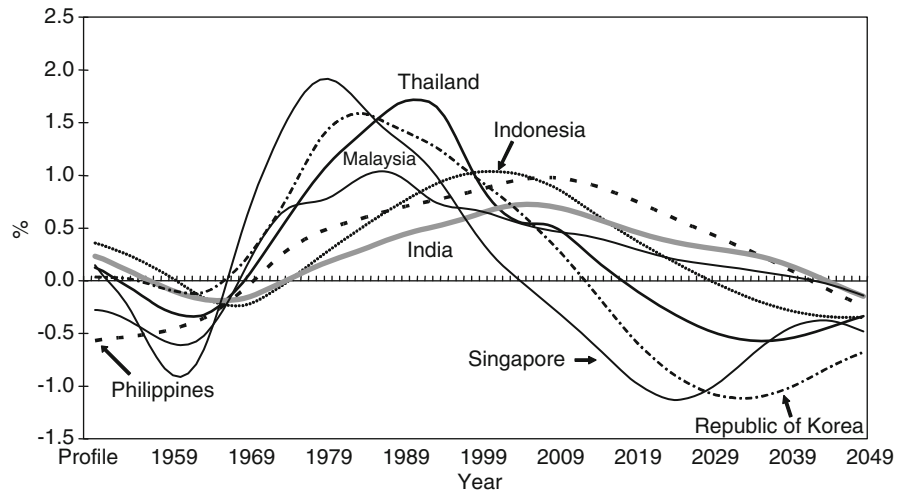


Fig. 7.10 Trend in second demographic dividend in Japan, 1950–2050

Fig. 7.11 First demographic dividend in selected Asian countries, 1950–2050



Note: Computed by authors.

as a result of fertility reduction should make effective plans in advance so that the opportunities of the first demographic dividend could be efficiently utilized for boosting their future economic growth.

As indicated in Fig. 7.12, the timing and length of the second demographic dividend for these Asian countries vary considerably. The plotted results clearly reveal that these Asian countries enjoy a considerably large second demographic dividend. It should be borne in mind, however, that the accumulation of the second dividend is subject not only to demographic transformations but also to a set of policies to be adopted while the first dividend is both positive and sizable.

Before closing this section, we should pay attention to increasing competitiveness among major finan-

cial institutions in Japan in the recent past. Numerous banks and life insurance companies have been paying great attention to the baby boomers and their accumulated wealth. Those born from 1947–1949 are now approaching their mandatory age of retirement. As already discussed in this section, both first and second demographic dividends have been generated over the course of Japan’s demographic transition after World War II.

Figure 7.13 plots the age profile of asset holding in Japan in 1999 among the elderly aged 60 and over. Using the 1999 round of NSFIE, we have estimated their age-specific pattern of holding real assets and financial assets. In addition, we have computed the present value of the expected future stream of their public pension benefits. The detailed computational

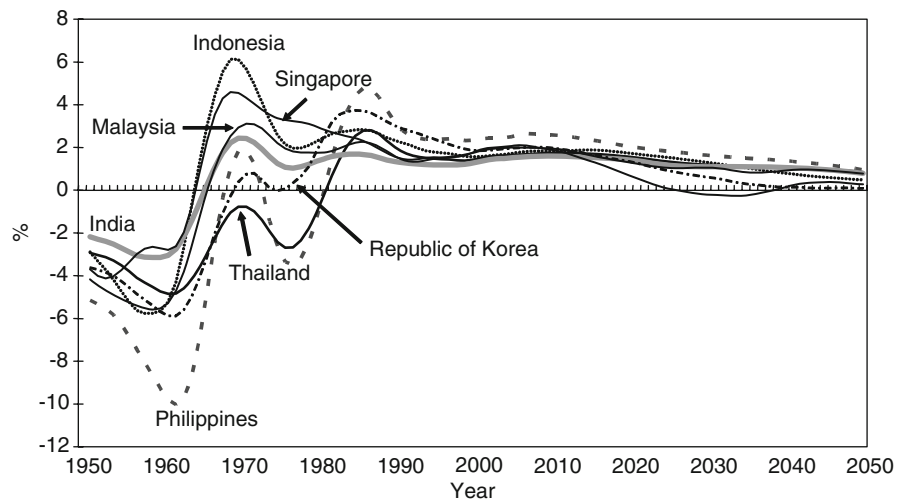
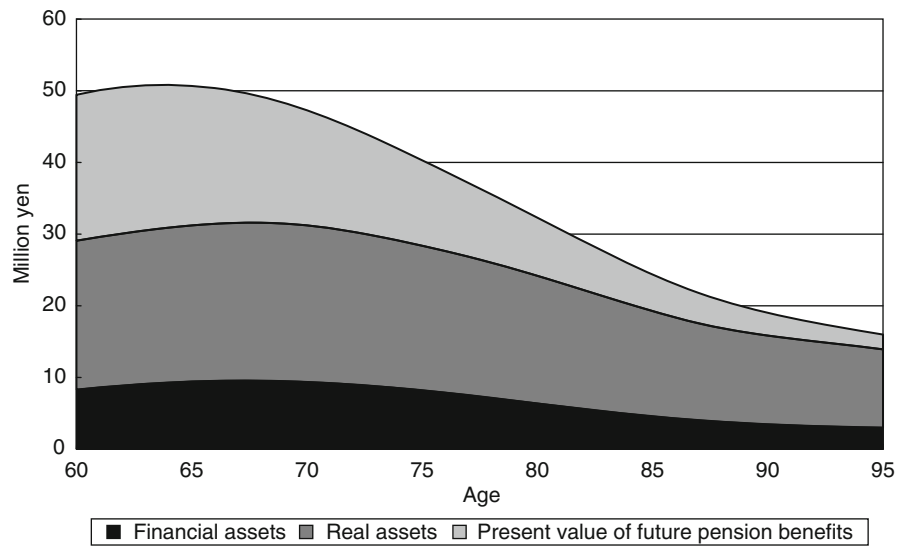


Fig. 7.12 Second demographic dividend in selected Asian countries, 1950–2050

Note: Computed by authors.

Fig. 7.13 Age profile of assets and pension wealth in Japan, 1999



procedure and assumptions employed are available elsewhere (Ogawa and Matsukura 2007).

A quick glance at this graph reveals that the Japanese elderly are wealthy. At age 60, the total amount of assets an average person owns is more than 50 million yen, or US\$0.5 million. In fact, they are wealthier than what this graph shows, because private pensions are not included in the computation. In addition, various types of familial transfers are not included.

It is interesting to observe that the amount of public pension wealth is greater than that of real assets at a relatively early stage of retirement life but the latter exceeds the former by a great margin at a later stage of retirement life. This seems to suggest that the liquidation of real assets such as land and housing is crucial for very old persons, particularly those who are living alone. There seems to be a substantial potential for developing various financial schemes such as the reverse mortgage plan.

Attention should also be drawn to the fact that the Japanese people's preference for land has been changing to a considerable degree over the last 10 years or so, during Japan's "lost decade". According to the National Opinion Survey on Land Issues conducted by the Ministry of Land, Infrastructure and Transportation in 2004, the proportion of those aged 20 and over who think that land is a better asset than financial assets such as savings and securities declined from 62 per cent in 1993 to 33 per cent in 2004. This result may suggest that an increasing proportion of the Japanese elderly need more information regarding

investment opportunities. Caution should be exercised, however, with regard to the lack of appropriate knowledge pertaining to various financial markets. According to a recent report released by the OECD (2005b), 71 per cent of the population aged 20 and over have no knowledge about investment in equities and bonds, 57 per cent have no knowledge of financial products in general and 29 per cent have no knowledge about insurance, pensions and tax.

Changing Pattern of Lifecycle Deficits and Lifecycle Reallocations

NTA, which measures intergenerational flows for a certain time period (usually a calendar or fiscal year), is governed by the following accounting identity, which holds for any individual, household, age group or economy (Mason et al. 2006):

$$y^l + r(K + M) + \tau_g^+ + \tau_f^+ = C + I_K + I_M + \tau_g^- + \tau_f^- \quad (1)$$

where y^l = labor income; rK = returns to capital; rM = returns to land and credit; τ_g^+ = transfer inflows from the public sector; τ_f^+ = transfer inflows from the private sector; C = consumption; I_K = investment in capital; I_M = investment in credit and land; τ_g^- = transfer outflows to the government; and τ_f^- = transfer outflows to the private sector.

It should be noted that no distinction is made between capital (K) and land/credit (M) in the paper.

Designating asset income by y^A , assets by $A=K+M$ and saving by $S = I_K + I_M$, substituting these into equation (1) and rearranging terms gives us the key flow components of NTA. Furthermore, the difference between consumption and production corresponds to the life cycle deficit and must be matched by age reallocations consisting in reallocations through assets and net transfers as expressed below:

$$\underbrace{C - y^l}_{\text{Lifecycle deficit}} = \underbrace{y^A - S}_{\text{Asset reallocations}} + \underbrace{\tau_g^+ - \tau_g^-}_{\text{Net public transfers}} + \underbrace{\tau_j^+ - \tau_j^-}_{\text{Net private transfers}} \quad (2)$$

$\underbrace{\hspace{15em}}_{\text{Age reallocations}} \quad \underbrace{\hspace{10em}}_{\text{Net transfers}}$

In this section of the paper, we will discuss computed results for a few Asian countries (primarily Japan for the sake of convenience, as well as Thailand and Indonesia). Before proceeding to our discussion of computational results, however, caution should be exercised with regard to the definitions of a few terminologies to be used in the remaining part of the present paper. As shown on the right-hand side of equation (2), transfers are further broken into net public transfers and net private transfers, the latter of which are composed of bequests and inter vivos transfers. It should also be noted that “familial transfers” and “private transfers” are used interchangeably, by referring to transfers coming from other family members of the same or different households.

It is also important to note that the estimated values for the totals are adjusted on the basis of the National Income and Product Accounts (NIPA) values, thus insuring consistency with NIPA. Labor income, however, does not exactly correspond to the NIPA counterpart, because the income of those self-employed includes returns to labor and capital. Based upon a simplifying assumption, we allocate two-thirds of this income to labor and one-third to capital. A fuller explanation of NTA’s basic concept, the crucial computational assumptions utilized and the definitions of other key variables are available on the NTA home page (<http://www.ntaaccounts.org>).

Figure 7.14 presents the changing pattern of three components of reallocation of the lifecycle deficits for Japan from 1984 to 2004. The three components include reallocations through assets, public transfers and private transfers, measured on a monthly basis. Panel A illustrates the per capita reallocation of the lifecycle deficits observed in 1984, Panel B for 1994 and Panel C for 2004.

A quick glance at these three panels reveals a few points of interest. First, the nominal values of these three components increased substantially over the period 1984–1994 as a consequence of the bubble economy (1986–1990). In contrast, the corresponding values for the subsequent 10-year period (1994–2004) changed to a less pronounced degree due to the influence of “Japan’s lost decade.”

Second and more importantly, although both public and private transfers to the young population from the working-age population remained virtually unchanged from 1994 to 2004, the corresponding values to the elderly population from the productive population increased to a large extent.

Third, the composition of transfers to the elderly population changed dramatically over time under review. A brief comparison of these three panels clearly shows that the amount of public transfers to the elderly population increased significantly, although the corresponding value for private transfers slightly declined. These results seem to indicate that the Japanese elderly have been increasingly dependent upon public transfers (mainly pensions and medical care services), or “public goods.” In other words, the role played by familial transfers is becoming less important in supporting the retirement life of the contemporary Japanese elderly.

On the basis of Figure 7.14, we have prepared another graphical presentation that shows a changing pattern of intergenerational transfers and asset allocations at the macro level, by utilizing age-specific population data for the three selected years in question. The computational results are shown in the three panels of Fig. 7.15. The three panels clearly show the massive impact of population aging upon Japan’s social security system (mainly pensions, medical care services and long-term care insurance) in recent times. That is, the public transfers directed to the elderly population have become extremely important over time. In contrast, the importance of the familial transfers for the elderly population has been dwindling in both absolute and relative terms over the last two decades.

There are several more important points to be noted in Fig. 7.15. First, due to the shrinking size of the young population, the amount of the public resources going into this population group has marginally diminished over the period 1994–2004. Second, the young age group, 0 to 19 years old, receives nearly as many transfers from the government as from the family.

Fig. 7.14 Changing pattern of three components of reallocation of lifecycle deficits, on a per capita basis

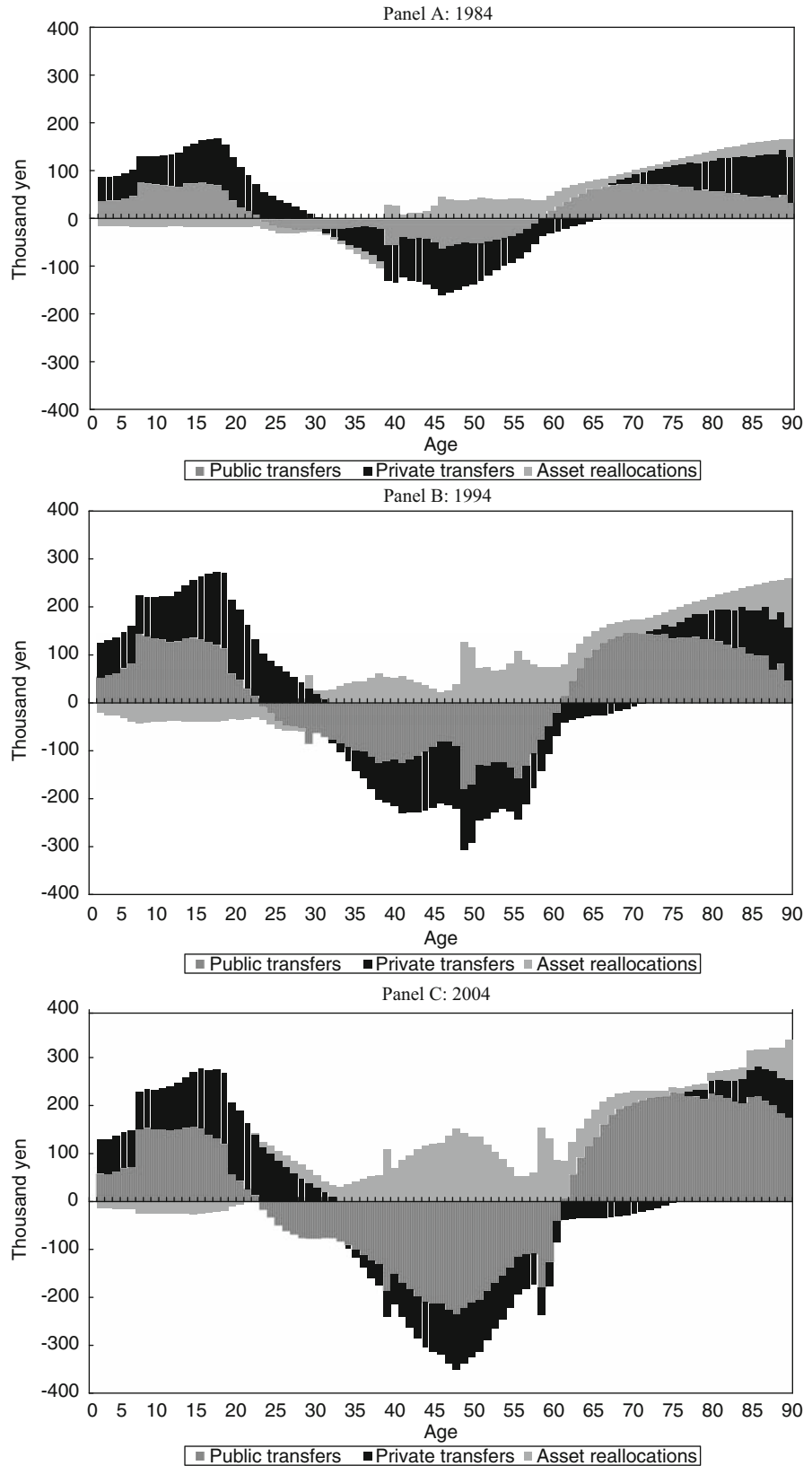


Fig.7.15 Changing pattern of three components of reallocation of lifecycle deficits, adjusted to the total population

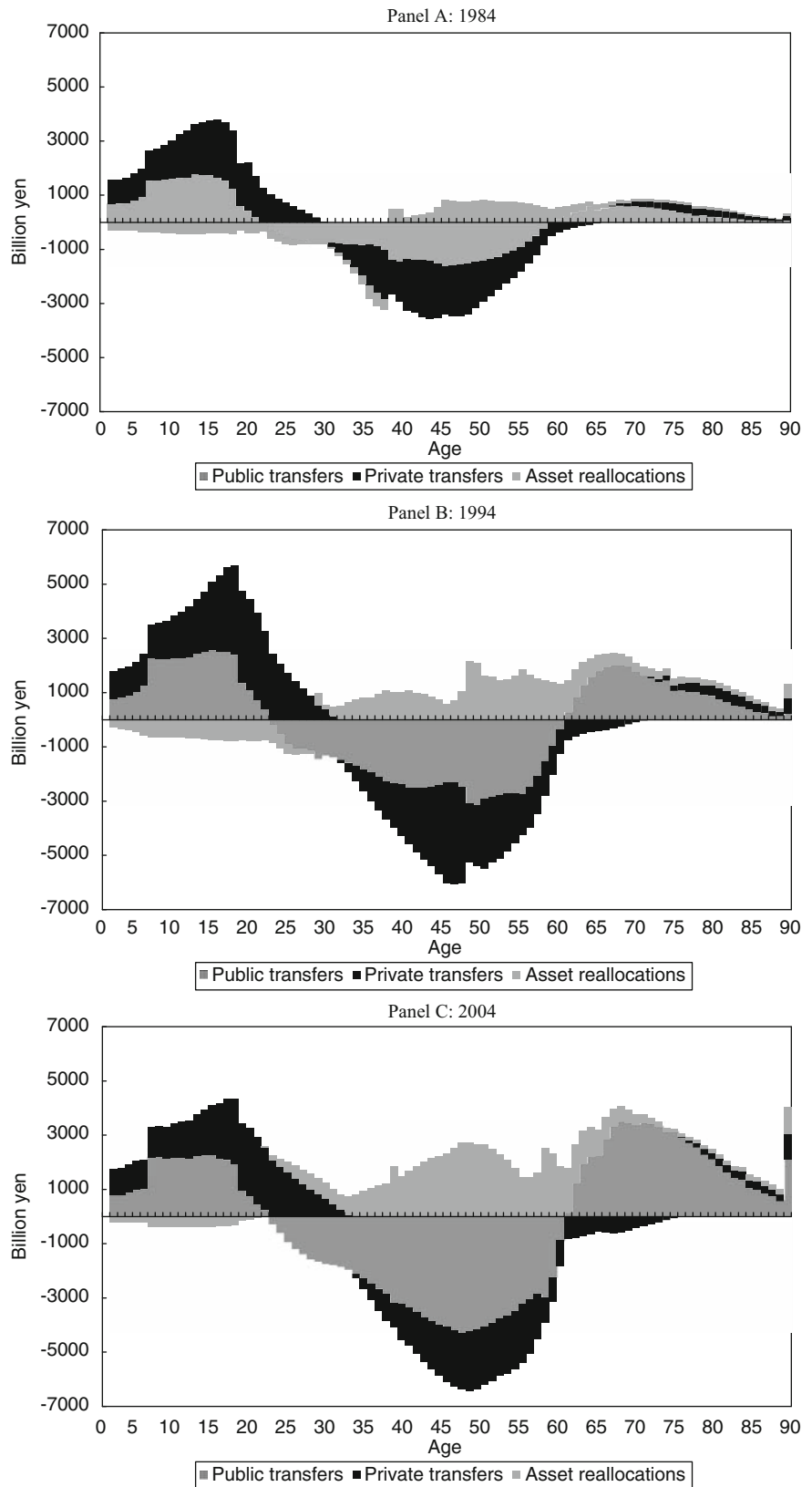
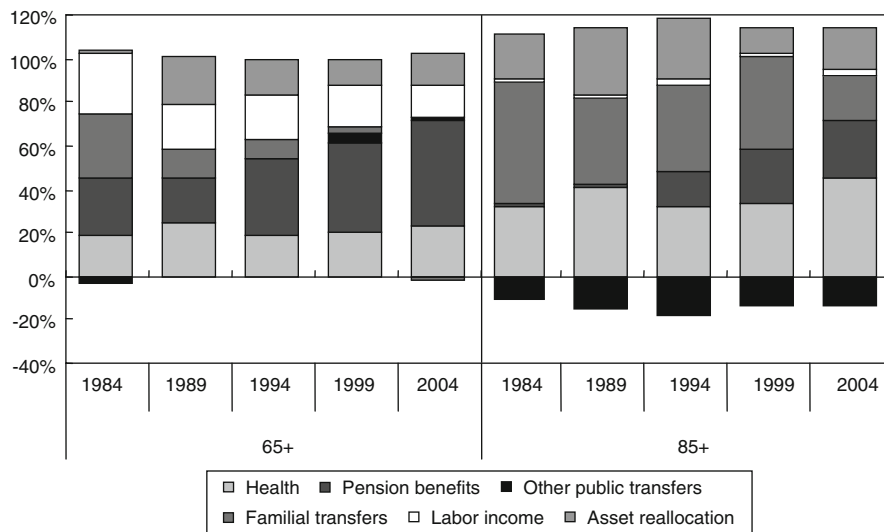


Fig. 7.16 Finance of consumption of elderly 65+ and 85+, 1984–2004



Third, the productive age groups pay taxes and social security contributions to the government, which are reallocated through public transfers. Thus, those who belong to the age groups 20–60 experience negative net public transfers. The peak age of tax burden (negative public transfers) shifts right-ward (to higher ages) over time, as the baby boom generation ages, as displayed in Fig. 7.15. In 2004, the peak of the tax burden occurred approximately at age 47, while in the earlier years the peak occurred between ages 40–45.

Fourth, asset reallocations, on the other hand, show an unclear pattern. A positive asset reallocation means that people receive returns from investing their assets. A negative asset reallocation occurs at young ages, mainly in the form of an investment in public facilities. Positive asset reallocations reach their peak when people are in their late 40s or early 50s and are comprised largely of the return to private investment, the majority of which is property income. Large asset reallocations among those in their early 20s to their 50s and 60s in 2004, when compared to 1984, indicate that asset reallocations became significantly important to finance deficits during the two decades in question. Furthermore, the role played by the returns from investment became considerably more important over time in financing deficits among those aged 60 and over, although the magnitude of such increased importance of the investment returns was not as large as that of public transfers.

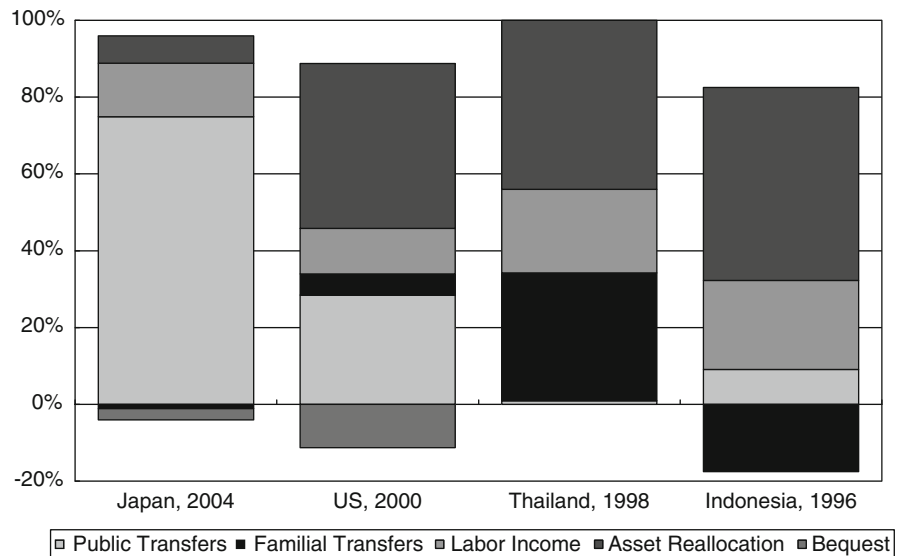
Fifth, the three panels in Fig. 7.15 indicate that lifecycle deficits change from negative to positive,

approximately starting around age 60. Large public transfers, small familial transfers and significant asset reallocations make up for positive deficits beyond age 60. This pattern has become more pronounced over time during the 20-year time span under review.

In Fig. 7.16, we have plotted a change in the pattern of financing consumption among the two elderly groups (65+ and 85+) from 1984 to 2004. Among those 65 and over, the role of public pensions and medical services has been increasingly important. In contrast, familial transfers have become less important over time. Surprisingly, in 2004, the direction of flow of familial transfers has changed from the elderly to the young or working-age population. It should be emphasized, however, that the inflow of familial transfers from the younger population is still significant among those aged 85 and over. This may be due to the fact that the elderly of this old age group receive a relatively limited amount of pension benefits as a result of their shorter contribution period.

Figure 7.17 compares the pattern of financing consumption among the elderly aged 65 and over in the following four countries: Japan, Thailand, Indonesia and the United States. It is astonishing to see that among these four selected countries, the elderly in Japan are the only case in which inter vivos transfers are negligible. In the United States, there is a considerable component of inter vivos transfers in financing consumption among the elderly. It is inter-

Fig. 7.17 Finance of consumption, old dependents (age 65+) of selected countries



esting that the direction of flow of inter vivos transfers differs from country to country. For instance, Indonesia shows a direction opposite to the United States and Thailand.

Concluding Remarks

In the first half of this paper, we have extensively discussed the process of unprecedented population aging in Japan and its uniqueness. We have also related these rapid demographic changes to a host of socioeconomic developments and familial transformations in postwar Japan. In the second half of this paper, we have examined some of the important impacts of population aging in Japan, by heavily drawing upon the computed results of the NTA project, ranging from the first and second demographic dividends to the lifecycle reallocations. We have also discussed the rapidly changing pattern of public and familial support systems for the elderly in Japan as well as a few selected countries in Asia.

Generally, judging from numerous past experiences of many industrialized countries in the West, demographic solutions have not been successful in coping with the various issues arising from population aging. For instance, low fertility is resistant to policy and immigration measures are of limited help. (Particularly, the latter policy option is basically inconceiv-

able for the majority of the Japanese population and is still only a remote possibility in contemporary Japan.) Yet the utilization of the first demographic dividend as well as the accumulated second demographic dividend among the elderly seem to have some promising potential in placing a country's economic growth on a steady growth path.

One major question arises: how do Japanese elderly persons make use of their accumulated assets and wealth? Depending upon where they invest their financial resources, Japan's future economic growth performance is bound to differ considerably. If Japanese elderly persons are provided with sufficient knowledge about the dynamics of the financial market, they may have a good potential for investing their accumulated assets possibly outside Japan. Moreover, as analyzed by Cheung et al. (2004), the timing of the "first demographic dividend" for selected Asian countries varies considerably. As examined earlier, Japan's first dividend ended in 1996. In contrast, in the case of China, for instance, its first dividend lasts for 40 years from 1990 to 2030. In an era of globalization, the healthier and wealthier Japanese elderly will be able to invest their assets in a dynamically growing Chinese economy and bring in financial gains back to Japan. Obviously, to facilitate such international transactions, proper institutional and legal arrangements need to be developed to protect the elderly investors.

In contemporary Japan, the elderly are generally considered as "debts". However, the above discussion

suggests that Japanese elderly persons would become powerful “assets” to keep the country on a steady growth path in the years to come.

By heavily drawing upon the Japanese case, this paper has attempted to demonstrate the usefulness of NTA results as a solid base for analyzing the impact of population aging and formulating effective long-term policies to cope with its adverse effects.

Acknowledgements Research for this paper was funded by two grants from the National Institute of Health, NIA R01-AG025488 and AG025247. This work was also supported by a grant obtained by the Nihon University Population Research Institute from the “Academic Frontier” Project for Private Universities: matching fund subsidy from MEXT (Ministry of Education, Culture, Sports, Science and Technology), 2006–2010. Furthermore, the authors are grateful to the UNFPA (RASSP203) and the Japan Medical Association for their financial assistance.

References

- Benedict R (1946) *The Chrysanthemum and the sword*. Houghton Mifflin Company, Boston
- Cabinet Office (2002) *The fifth round of the international survey of lifestyles and attitudes of the elderly*. Gyousei, Tokyo
- Cheung SLK, Yip P, Chi I, Golini A, Robine J-M (2004) Change in demographic window in low fertility countries. Paper presented at International Seminar on the Demographic Window and Healthy Aging: Socioeconomic Challenges and Opportunities, Beijing, May 10–11 2004
- Ermisch JF, Ogawa N (1994) Age at motherhood in Japan. *J Popul Economics* 7, pp 393–420
- Gibson MJ (1992) Public health and social policy. In: Kendig H, Hashimoto A, Coppard LC (eds), *Family support for the elderly: the international experience*. Oxford University Press, Oxford
- Hashimoto A (1984) *Old people in Japan and America: A comparative community study*. Unpublished Ph.D. Dissertation, Yale University, New Haven
- Health and Welfare Statistics Association (2005) *Trends in national health*. Health and Welfare Statistics Association, Tokyo
- Hodge R, Ogawa N (1991) *Fertility change in contemporary Japan*. University of Chicago Press, Chicago
- IMD (2007) *IMD World competitiveness yearbook 2007*. IMD, Lausanne
- Kendig H (1989) Social change and family dependency in old age: Perceptions of Japanese women in middle age, NUPRI research paper series 54. Nihon University Population Research Institute, Tokyo
- Lievre A, Brouard N (2003) The estimation of health expectancies from cross-longitudinal surveys. *Mathematical Population Studies* 10 (4), pp 211–248
- Lievre A, Saito Y (2005) Projection of disability among elderly Japanese using transition probabilities. Paper presented at the NUPRI Occasional Seminar, held in Tokyo, Japan, April 12, 2005
- Mason A (ed) (2001) *Population change and economic development in East Asia: Challenges met, and opportunities seized*. Stanford University Press, Stanford
- Mason A (2005) Demographic transition and demographic dividends in developed and developing countries. Paper presented at the United Nations expert group meeting on social and economic implications of changing population age structure. Mexico City, August 31–September 2, 2005
- Mason A, Ogawa N (2001) Population, labor force, saving and Japan’s future. In: Bloomstrom M, Gangnes B, and Lacroix S (eds) *Japan’s new economy: Continuity and change in the twenty first century*. Oxford University Press, Oxford
- Mason A, R Lee (2005) Reform and support systems for the elderly in developing countries: Capturing the second demographic dividend. *Genus* 62 (2), pp 11–35
- Mason A, Lee R, Tung A-C, Lai M-S, Miller T (2006) Population aging and intergenerational transfers: Introducing age into national accounts: NBER working paper series 12770
- Matsukura R, Ogawa N, Clark RL (2007) Analysis of employment patterns and the changing demographic structure of Japan. *The Japanese Economy* 34 (1), pp 82–153
- OECD (2005a) *Pension at glance*. OECD, Paris
- OECD (2005b) *Recommendation on principles and good practices for financial education and awareness*. OECD, Paris
- Ogawa N (2003) Japan’s changing fertility mechanisms and its policy responses. *J Popul Res* 20, pp 89–106
- Ogawa N (2005) Population aging and policy options for a sustainable future: The case of Japan. *Genus* 61, pp 369–410
- Ogawa N, Jones G, Williamson J (eds) (1993) *Human resources in development along the Asia-Pacific rim*. Oxford University Press, Singapore
- Ogawa N, Retherford RD (1993) The resumption of fertility decline in Japan: 1973–1992. *Popul Dev Rev* 19 (4), pp 703–741
- Ogawa N, Clark RL (1995) Earnings patterns of Japanese women, 1976–1988. *Econ Dev Cul Change* 43, pp 293–313
- Ogawa N, Ermisch JF (1996) Family structure, home time demands, and the employment patterns of Japanese married women. *J Lab Econ* 14, pp 677–702
- Ogawa N, Retherford RD (1997) Shifting costs of caring for the elderly back to families in Japan. *Popul Dev Rev* 23 (1), pp 59–94
- Ogawa N, Kondo M, Tamura M, Matsukura R, Saito T, Mason A, Tuljapurkar S, Li N (2003) Long-term perspectives for Japan: An analysis based on a macroeconomic-demographic-social security model with emphasis on human capital. Nihon University Population Research Institute, Tokyo
- Ogawa N, Kondo M, Matsukura R (2005) Japan’s transition from the demographic bonus to the demographic onus. *Asian Popul Stud* 1 (2), pp 207–226
- Ogawa N, Matsukura R (2007) Ageing in Japan: The health and wealth of older persons, United Nations expert group meeting on social and economic implications of changing population age structures, New York, United Nations, pp 199–220
- Population Problems Research Council (2004) *National Survey on population, families and generations*. Mainichi Newspapers, Tokyo

- Retherford RD, Ogawa N, Sakamoto S (1999) Value and fertility change in Japan. In: Leete R (ed) Dynamics of values in fertility change. Oxford University Press, Oxford pp 121–147
- Retherford RD, Ogawa N (2006) Japan's baby bust: causes, implications, and policy responses. In: Harris F (ed) The baby bust: Who will do the work? Who will pay the taxes? Rowman & Littlefield Publishers, Inc., pp 5–47
- Sano C (1958) Changing values of the Japanese family. Greenwood Press, Westport, CT
- Social Insurance Agency (2005) Outline of social insurance in Japan 2004. Japan International Social Security Association, Tokyo
- Statistics Bureau (2007) Annual report on the labour force survey. Japan Statistical Association, Tokyo
- Supreme Court (1996) Annual report of judicial statistics for 1995, 3: Family cases. Housokai. In Japanese, Tokyo
- United Nations (2007) World population prospects: The 2006 revision. New York, United Nations
- Yoshikawa H (2001) Japan's lost decade. International House of Japan, Tokyo

Chapter 8

Population Aging in China

Feinian Chen and Guangya Liu

Introduction

The proximate determinants of population aging in China are fundamentally the same as those in any other country. It is an inevitable consequence of the process known as the “demographic transition” in which declining fertility together with a rise in life expectancy leads to a shift towards an older age structure of the population. Yet, the story of population aging in China is unmistakably unique, shaped by its distinct historical, cultural, economic and political contexts. The pace of its aging trend is by itself unparalleled, with the proportion of older adults projected to grow from 6.8 per cent to 23.6 per cent over the first half of the twenty-first century (United Nations 2005). As the most populous country in the world, this increase in the population of elderly translates to an astounding growth of 242 million people, which would qualify it for the fourth largest population in the world today.

On the one hand, the rapid aging process in China conforms to a global trend, with the forces of industrialization, urbanization and associated changes in value systems affecting the demographic dynamics. On the other hand, no other country around the world has had their government play such a pivotal role in accelerating the aging transition. Among these influential governmental courses of action, perhaps the most well-known is the “one-child” policy, without which the decline in fertility would not have been so drastic and abrupt. Preceding the drop of fertility in the

1970s was also the consistent and sustained decline of mortality, which was a direct consequence of strong government health intervention programs. The state influence was also reflected by the divergent aging trajectories of the urban and rural areas, arbitrarily augmented by the *Hukou* system (a household registration system that divides the population into “agricultural” and “non-agricultural” sectors) and strict state control on migration to a certain extent.

It is the purpose of this chapter to examine the multifaceted process of population aging in China, with particular attention to its socialist/communist background. We begin by exploring the demographic determinants and trends of population aging, highlighting the role of state policies in facilitating the fertility and mortality declines. To address the issue of elderly caregiving, we examine the traditional family support system and the challenges it faces since the launch of the economic reform policies in 1978. We then review the on-going pension and health care reforms initiated by the government as strategies to meet the demands of an aging population. In the conclusion, we discuss the dilemma that the government faces in balancing economic development and providing adequate old-age support. Lastly, we review some alternative policy options and potential opportunities China may have in addressing this global population problem of the 21st century.

An Accelerated Model of Mortality and Fertility Decline

As one of the oldest human societies in existence, China’s population history up to the twentieth century fits the description of the pre-transitional stage

F. Chen (✉)
Department of Sociology and Anthropology
North Carolina State University
Raleigh, NC, USA
E-mail: feinian_chen@ncsu.edu

of the classic model of demographic transition. Under a high fertility and high mortality regime, the population fluctuated between 37 and 60 million in size for over a thousand years prior to the 17th century; then for the first time experienced rapid growth and reached a size of over 400 million during the reign of the Qing Dynasty (1749–1851); but then had its growth slowed again between 1851 and 1949 as a consequence of the social turmoil caused by civil wars and imperialist invasions (Banister 1992). The establishment of the People's Republic of China in 1949 marked the beginning of its demographic transition, a process that distinguished China from the rest of world due to its extraordinarily rapid declines of mortality and fertility (see Fig. 8.1), neither of which would have been possible without strong government intervention.

The route to low mortality in China was deemed “exceptional” by Caldwell (1986), because it achieved world spotlight success in improving life expectancy with a poor and non-industrialized economy within a short period of time. Beginning from the 1950s, the state engaged in mass public health campaigns against parasitic and infectious diseases, with efforts including environmental clean-ups, expanded immunization/vaccination programs, establishments of Hygiene and Anti-Epidemic Stations around the country and the introduction of “barefoot doctors” (medical personnel with basic training to deal with hygiene matters and medical practice in rural China) (Cook and Dummer 2004; Lee 2004; Woo et al.

2002). The results from these government sponsored programs were impressive. Mortality first dropped suddenly and continuously, except in the three famine years (1959–1961), achieving a low mortality level (with crude death rates around 6.5 per 1000 in the 1970s) (see Fig. 8.1). The life expectancy at birth rose from a low 41 in 1950 (5 years below the world average) to 66 in 1980 (5 years above the world average) (see Table 8.1). During the same time, the infant mortality rate, a frequently used indicator for national development, also dropped from as high as 195 per 1000 in 1950 to 52 per 1000 within a thirty year period (see Fig. 8.1).

After the Chinese government launched its economic reform policies in 1978, the public health programs received less government investment (see details in later discussion). However, mortality continued to decline at a moderate pace in the 1980s and onward, with an overall decline in deaths caused by infectious diseases but an increase in deaths from chronic diseases (Cook and Dummer 2004). The life expectancy in 2006 is estimated to be 70 for males and 74 for females, well above the average level for other less developed countries (64 for males and 67 for females) and close to that of developed countries (73 for males and 80 for females) (Population Reference Bureau 2006).

The onset of the fertility decline in China did not start until the late 1960s, almost two decades after the initial decline in mortality. The total fertility rate was still as high as 5.6 in 1950, then fluctuated

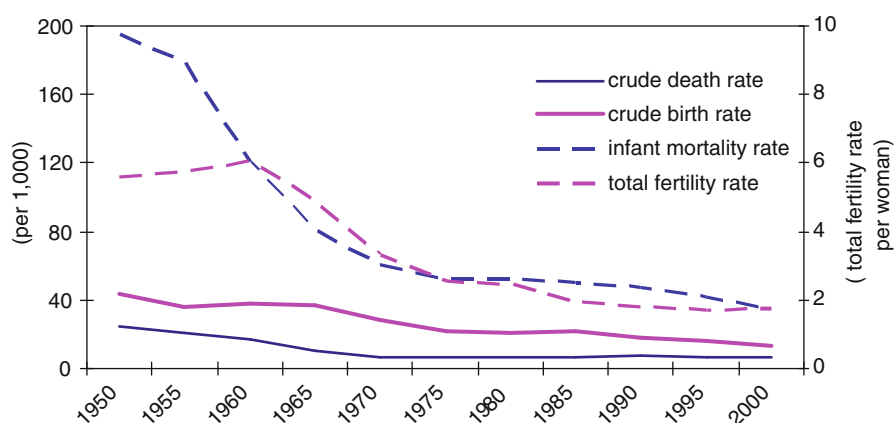


Fig. 8.1 Trends of fertility and mortality in China, 1950–2000

Source: United Nations (Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat). 2005. *World Population Prospects: The 2004 Revision Population Database*. <http://esa.un.org/unpp/>.

between the mid-1950s to early 1960s due to natural and human disasters such as the famine and the Great Leap Forward and peaked around 6.0 in the mid 1960s during a brief economic recovery (see Fig. 8.1). Afterward, fertility began its sustained decline in China. In 1971, China started the *wan xi shao* program (later marriages, longer intervals between children and fewer children), resulting in a steep decline in the total fertility rate (see Fig. 8.1). In the late 1970s, China underwent a major leadership shift in the government. With economic development as the primary agenda of the country, the leaders were concerned with the detrimental effect of rapid population increase on improving the standard of living. As a result, a more intensive family planning program, known as the “one-child” policy was launched in 1979. This program was and remains a carefully drawn system of economic incentives for one-child families and disincentives for larger families, with tremendous regional and local variations (Li 1995; Short and Zhai 1998; Winckler 2002). The one-child policy was deemed a success, resulting in a 70 per cent drop in fertility in less than twenty years, the fastest decline ever recorded in history. Researchers have been careful to note that the reduction was not only a consequence of government policy but also a response to social and economic development (Feeney and Wang 1993; Merli and Smith 2002; Poston 2000; Tien 1984).

It is important to note that there are tremendous sub-national differences in mortality and fertility levels, particularly between urban and rural areas, with the division arbitrarily enforced by the *Hukou* (Household Registration) system. Due to differences in the standard of living and access to health care, urban residents enjoy a life expectancy that is on average five years longer than that of rural residents at the turn of the 21st century (Wang and Mason 2004). The fertility difference is even more pronounced. The fertility gap between urban and rural population existed even prior to the implementation of the one-child policy, with a three-child difference between urban and rural TFRs in the early 1970s (Poston 1992). The one-child policy was strictly implemented in urban China since the 1980s, whereas rural communities instituted a two-child policy (allowing for a second child when the first birth is a girl) in response to the desire for sons and in the absence of a formal old age support system in rural areas (Short and Zhai 1998). The rural-urban differ-

ential narrowed somewhat since the 1980s but urban TFR was only half of that of the rural areas (e.g., in 1981, the TFR was 2.9 for rural areas and 1.4 for urban areas, see Poston 1992).

The Trend of Population Aging in Urban and Rural China

The very success of China’s mortality and fertility decline has accelerated the process of population aging in China. Political leaders gave little thought to this issue three decades ago, when all the attention was focused on controlling the population size. The median age of the population increased from 23.9 in 1950 to 32.6 in 2005, a 36 per cent increase in half a century (see Table 8.1). Under the United Nations’ medium fertility and mortality assumption, it is projected to further increase to 49.8 by 2050, well above that for the U.S. (41.1) and the world (37.8). The proportion of the population aged 65+ in China was below 7 per cent prior to the 21st century but will quickly climb to 13.7 per cent in 2025 and will constitute almost a quarter of its population by 2050. Given the sheer population size of China, this figure will translate into 329 million people over age 65 in 2050, a number that is ten per cent larger than the size of the current U.S. population.

As mentioned earlier, the rural-urban differentials in the timing and levels of mortality and fertility decline have naturally led to divergent aging trends between these areas (Qiao 2001). Using the urban/rural definition from the 1982 population census, Wang and Mason (2007) projected that 15 per cent of the urban population would be 65 years and older in 2017, while the same figure would not be achieved in rural China until twenty years later. However, massive rural to urban migration that started in the 1980s may very well change the scenario. It was conservatively estimated that the size of the “floating population” (“temporary” migrants) reached nearly 79 million, according to the 2000 census tabulation (Liang and Ma 2004). Taking net out-migration into account, Wang and Mason (Forthcoming) found that aging in rural China would occur much faster and sooner, with the proportion of the population aged 65+ reaching the level of the current urban population as early as 2009.

Table 8.1 Selected indicators of trends of aging in China, the U.S. and the world, 1950–2050

	Proportion of 65+				Proportion of 80+				Median age				Old-age dependency ratio				Life expectancy			
	China		World		China		World		China		World		China		World		China		World	
	U.S.	China	U.S.	World	U.S.	China	U.S.	World	U.S.	China	U.S.	World	U.S.	China	U.S.	World	U.S.	China	U.S.	World
1950	4.5 (24,851)	8.3 (13,043)	5.2 (130,875)	0.3 (1,559)	1.1 (1,801)	0.5 (13,780)	23.9	30.0	23.9	7	13	9	40.8	68.9	46.6					
1955	4.6 (28,109)	8.8 (15,073)	5.3 (145,591)	0.3 (1,893)	1.3 (2,223)	0.6 (16,080)	22.5	30.2	23.5	8	14	9	44.6	69.7	49.7					
1960	4.8 (31,769)	9.2 (17,101)	5.3 (161,594)	0.4 (2,344)	1.4 (2,643)	0.6 (18,826)	21.8	29.6	23.2	9	15	9	49.5	70	52.5					
1965	4.4 (32,057)	9.5 (18,944)	5.3 (178,349)	0.4 (3,114)	1.6 (3,154)	0.7 (22,247)	20.4	28.3	22.5	8	16	9	59.6	70.4	56.2					
1970	4.3 (35,806)	9.8 (20,667)	5.5 (203,114)	0.5 (4,002)	1.8 (3,837)	0.7 (26,746)	19.7	28.2	22.2	8	16	10	63.2	71.5	58.1					
1975	4.4 (40,830)	10.5 (23,035)	5.7 (231,660)	0.6 (5,105)	2.1 (4,690)	0.8 (31,451)	20.6	28.8	22.4	8	16	10	65.3	73.3	59.9					
1980	4.7 (47,426)	11.2 (25,871)	5.9 (263,947)	0.4 (4,329)	2.4 (5,460)	0.8 (35,948)	22.1	30.1	23.1	8	17	10	66.6	74.1	61.4					
1985	5.2 (55,478)	11.7 (28,423)	5.9 (287,564)	0.6 (6,111)	2.4 (5,916)	0.9 (43,691)	23.8	31.4	23.8	8	18	10	67.1	74.6	62.9					
1990	5.6 (64,357)	12.2 (31,283)	6.2 (325,407)	0.7 (7,839)	2.6 (6,658)	1.0 (53,044)	25.3	32.8	24.6	8	19	10	68.1	75.2	63.7					
1995	6.1 (74,178)	12.4 (33,403)	6.5 (371,764)	0.7 (8,821)	2.8 (7,565)	1.1 (61,571)	27.6	34.1	25.7	9	19	11	69.7	76.5	64.6					
2000	6.8 (87,228)	12.3 (35,078)	6.9 (421,351)	0.9 (11,373)	3.2 (9,138)	1.2 (70,254)	30.1	35.3	26.8	10	19	11	71.5	77.3	65.4					
2005	7.6 (100,020)	12.3 (36,710)	7.4 (475,719)	1.1 (14,766)	3.6 (10,605)	1.3 (86,648)	32.6	36.1	28.1	11	18	11	72.6	77.9	66.5					
2025	13.7 (197,268)	17.7 (62,069)	10.5 (832,151)	2.2 (31,560)	4.1 (14,213)	2.0 (160,219)	39.5	38.3	32.8	20	28	16	75.3	80.2	71.1					
2050	23.6 (329,103)	20.6 (81,547)	16.1 (1,464,938)	7.2 (100,551)	7.3 (28,725)	4.3 (394,224)	49.8	41.1	37.8	39	33	25	78.7	82.4	75.1					

Note: Proportions and ratios in per cent, total numbers (in thousands) in parentheses.

Source: United Nations (Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat), 2005. *World Population Prospects: The 2004 Revision Population Database*. <http://esa.un.org/unpp/>.

Growth of the Oldest Old Population

It is noteworthy that the growth of the oldest old (defined as 80+ years old) population will be most dramatic among the elderly population in the coming decades. While the proportion of 65+ years old will increase from 6.8 per cent in 2000 to 23.6 per cent in 2050, the proportion of 80+ years old will grow even more dramatically, from 0.9 per cent to 7.2 per cent (see Fig. 8.2). The share of the oldest old population will increase from 13 per cent to 30 per cent of the elderly population (defined as 65+) from 2000 to 2050. This is indeed no trivial issue, as the oldest old are more vulnerable than the younger old in many aspects – they are more likely to experience chronic diseases, mental health disorders and functional limitations. As a result, the oldest old require more assistance from family members, consume more medical services and need higher levels of physical, emotional and financial support than their younger older-adult counterparts (Gu and Zeng 2004; Zeng et al. 2002; Zimmer 2005).

The first longitudinal survey on the oldest old population in China, the China Longitudinal Healthy Longevity Survey (CLHLS), was conducted in 1998 and was subsequently followed up in 2000, 2002 and 2005 (see detailed description of the survey project in Zeng et al. 2002). Numerous published papers using the CLHLS data have called attention to issues such as the extent of functional limitations, the level of subjective well-being, urban versus rural as well as gender disparity in socioeconomic and health profiles and the association between living arrangements and health (Gu and Zeng 2004; Wu and Schimmele 2005; Zimmer 2005). Given the fast growth of the oldest old population, it is imperative to find out whether and how their needs are being met.

Filial Piety and Family Support

Traditionally, respect for elderly was an integral part of the Chinese value system. Filial piety (*xiao*), a primary virtue cultivated by Confucianist teaching, was the cornerstone in Chinese culture for thousands of years (Fei 1992). Being filial means that children must be deferential and completely obedient to their parents during their lifetime. Moreover, sons bear the ultimate responsibility of taking care of their aging parents. The Chinese proverb “*Yang Er Fang Lao* (Having sons makes one’s old age secure)” is an accurate depiction of this cultural ideal.

After the communist revolution in 1949, most Confucian doctrines were regarded as feudal practices and came under heavy attack. However, the notion that it was the children’s responsibility to take care of their parents was upheld by the government. The constitution of 1982 reiterated that it was the obligation of adult children to support and assist elderly parents (Palmer 1995). An adult child may face criminal charges for refusing to support an aged parent.

Despite the strong position of the government, the way in which the elderly are regarded is quickly changing in China, as witnessed elsewhere around the world, with words such as “burden” and “dependence” replacing “reverence” and “wisdom.” A plethora of research has been done on the impact of industrialization and urbanization as well as policy influences on the tradition of filial piety. In the following section, we review the current status of the family support system in China as well as the enormous challenges it faces in the near future. We examine trends of living arrangements and patterns of intergenerational relations and exchanges in the context of remarkable demographic and socio-economic transformations in China, with special attention paid to the rural-urban divide.

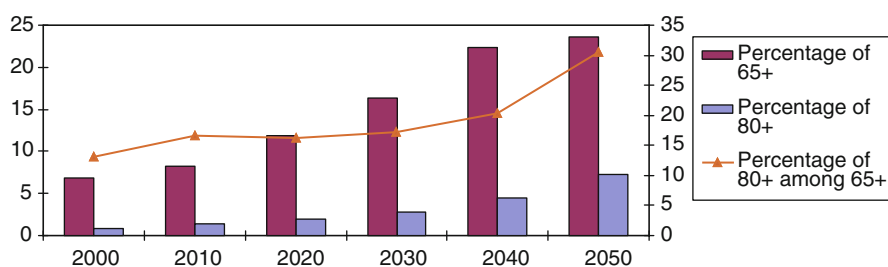


Fig. 8.2 Projection of the proportion of the population aged 65+ and 80+ in China 2000–2050

Source: United Nations (Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat). 2005. *World Population Prospects: The 2004 Revision Population Database*. <http://esa.un.org/unpp/>.

Trend of Living Arrangements

Studies on living arrangements of the elderly population are essential to understand the structure of kin availability for support. Because coresidence with family members often means they are more likely to receive support, living arrangements were often viewed as an indicator for well-being, despite mixed empirical findings on the relationship between living arrangements and health (Lawton et al. 1984; Sarwari et al. 1998; Zunzunegui et al. 2001).

The 2000 census showed that the majority of the elderly population (both those with a spouse or without a spouse) coresided with their children (either), with minimal urban and rural differences (see Fig. 8.3). The percentage of the elderly population living with children but not with a spouse was higher for women than for men and the percentage of those living with a spouse (with or without children) was higher for men than women, reflecting gender dif-

ferentials in mortality rather than marital status. This point is illustrated in Fig. 8.4, which presents statistics on marital status of older adults (65+) from the 2000 census. Marriage was nearly universal for both men and women; divorce was rare; and longer life expectancy resulted in a much higher rate of widowhood for women than men.

A comparison of living arrangements of the elderly population using the 1982, 1990 and 2000 census suggested that the level of coresidence seemed to decline slightly in the 1990s (from 68.1 per cent in 1982 to 59.0 per cent in 2000 for men and from 73.2 to 66.7 per cent for women, see Zeng and Wang 2003). At the same time, the proportion of elderly men and women living only with a spouse increased considerably over time (from 17.1 per cent in 1982 to 30.2 per cent in 2000 for males and from 11.7 to 21.7 per cent for females). Both trends suggest possibly increasing preferences of elderly parents to live independently (Logan et al. 1998; Logan and Bian 1999; Zeng and Wang 2003).

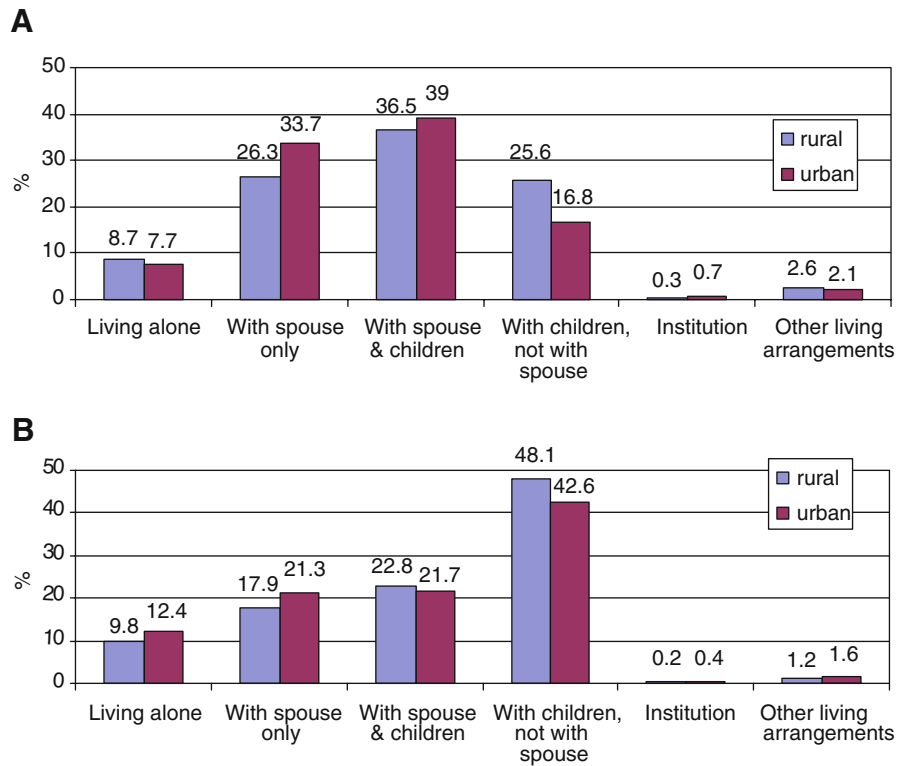
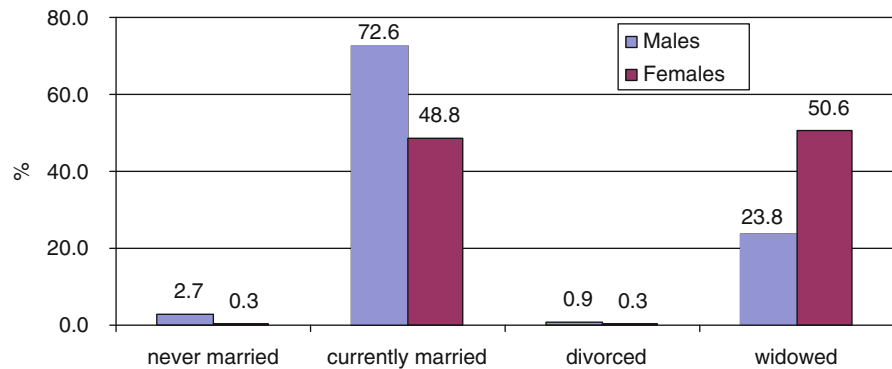


Fig. 8.3 A) Living arrangement among male older adults aged 65+ in China, 2000.

B) Living arrangement among female older adults aged 65+ in China 2000

Source: Zeng, Yi and Zhenglian Wang. 2003. "Dynamics of Family and Elderly Living Arrangements in China: New Lessons Learned from the 2000 Census." *The China Review* 3: 95-119.

Fig. 8.4 Marital status of older adults aged 65+ in China, 2000



Source: China National Statistical Bureau. 2003. *Tabulation on the 2000 Population Census of the People's Republic of China*. Beijing: All China Marketing Research Inc.

Using census and survey data collected around 2000, Zeng et al. (Forthcoming) macro-simulated the trend in elderly living arrangements under the medium assumptions on fertility, mortality, rural-urban migration, marriage and divorce. Despite being a conservative estimate (given that it does not take changing preference into account), their projection showed that the average household size would decrease from 3.46 persons per household in 2000 to 2.86 in 2020 and 2.69 in 2050 and that the proportion of the elderly aged 65+ living in “empty-nest” households would triple that of the 2000 level.

Intergenerational Exchanges and Relations

To interpret the declining prevalence of coresidence as a collapse of the traditional family support system is obviously an over-simplification of a complex situation. While coresidence is often considered the core of support relationships between elderly parents and adult children, intergenerational exchanges can easily transcend the boundary of the household. Studies have documented that non-coresident children often lived close by, maintained a high level of contact and provided regular help to their parents, suggesting the emergence of a “modified extended family” or “network” family (Bian et al. 1998; Chen 2005; Logan 1998; Logan and Bian 1999). The majority of the elderly population receives financial support from their adult children (China Research Center on Aging 1992). Similarly, most of the elderly parents who

are in need of help are cared for by family members (Davis-Friedmann 1991; Ikels 1997).

In a recently edited volume on intergenerational relations in contemporary urban China, Whyte (2003:306) concluded that “filial piety is alive and well in urban China.” The claim was grounded by survey evidence, such as parents receiving consistent emotional and financial support from adult sons and daughters, strong filial attitudes and filial behavior expressed by the younger generation, a relatively high coresidence rate and a high level of exchange between non-coresident parents and children. However, he cautiously noted that the traditional familial support system may be endangered in the future, within the context of dramatic decline in fertility, market reforms and global economic and cultural influence.

In rural areas, the picture is perhaps not as rosy. Scholars have long suspected that traditional family values were seriously undermined in rural China during the collectivization of agriculture in the 1950s. During this process, land, a major type of private property, was eliminated, which negatively affected parental authority (Davis and Harrell 1993; Parish and Whyte 1978). Although the economic reforms in the late 1970s restored the household as a basic production unit, the foundation for the authority of the elderly had already eroded, with power shifting to the better educated and more resourceful young generation. Several studies on elderly support in rural China describe the weakening of filial practice and the increasingly vulnerable situation of the rural elderly. These studies report increasing early (extended) household division, increasing numbers of elderly living alone, growing grievances from the

elderly and increasing incidences of failure to support parents (Yang and Chandler 1992; Leung 1997; Wang 2004 a; Zhang 2004).

There are ample reasons to believe that family support for the elderly in rural China will weaken in the years to come. The pressure of the demographic forces alone is extraordinary. Rural China is yet to face the impact of the one-child policy, which will substantially reduce the number of children available to share support duty in the next few decades. The unprecedented flow of rural-to-urban migration of the young generation has already created a geographic separation of adult children from their parents and thus may limit the children's capacity to fulfill their filial duties (Joseph and Philips 1999).

Government and Institutional Support for Elderly

As described above, the traditional family structure and family support system has undergone some major shifts in China. Facing the possibility of an undermined informal old age support system, it is imperative for the government to strengthen its role in public support. In the following section we outline three systems at different stages of policy development, including institutionalized care, health care and health insurance and old age social security.

Increasing Role of Institutionalized Care for the Elderly

Institutionalized care for the elderly has a very short history in China. In the 1950s, the Chinese government began to establish elderly homes in both rural and urban areas (mostly in cities), primarily accommodating the "Three-No" elders, who had no living children/relatives, little or no income and no physical ability to work (Chen 1996). After the economic reforms in 1978, elder care homes began to accommodate non-Three-No elders. As a result, the number of elder care homes gradually increased all over China, particularly

in urban areas, due to the increasing burden of caring for older adults with longer life expectancy.

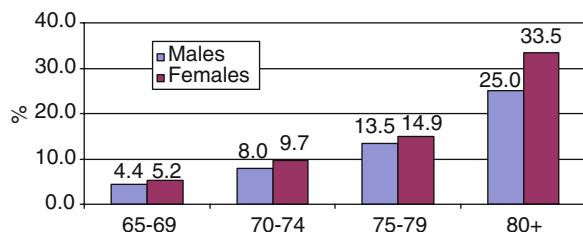
The rates of institutionalized care in many East Asian societies are significantly lower than in Western nations (Ikegami et al. 2003; Kim and Kim 2004). The major reason for the disparity is largely due to the cultural emphasis on the practice of filial piety in most East Asian societies, where frail parents are cared for by their children (especially daughters or daughters-in-law). Currently, the proportion institutionalized among the population aged 65 and over is less than 2 per cent and is only about 1 per cent among the oldest-old (aged 80 and over) in China (China National Research Center on Aging 2003; China National Statistical Bureau 2003). According to a recent report from the Ministry of Civil Affairs (2005), about 15 per cent of institutionalized residents are non-Three-No elders (roughly 20 per cent in urban areas and 10 per cent in rural areas), who are required to pay for admission and services.

Despite the increase in the number of elder care institutions and the changing social norms regarding institutionalized care, a strong cultural stigma remains attached to this living arrangement. While institutionalized older adults often feel embarrassed that they are "abandoned" by their children, the latter face the charge of being "unfilial" by sending their parents to nursing homes. However, the combination of an aging Chinese population, increasing number of young adults migrating away from home for work and the weakening of inter-generational relationships suggests that the rate of institutionalization will continue to grow over time. Therefore, it is worth investigating the physical, mental, political and social characteristics of institutionalized older adults in a traditionally family-care oriented society. For example, a recent study by Gu et al. (2007) shows that institutionalized oldest old are more likely to be younger, male, reside in urban areas, have lower family-care resources and have poorer health than community-residing oldest old. While institutional care is a rational, effective and seemingly unavoidable supplement and/or alternative for family care, it is also important to consider whether current policies are achieving their goals or whether individuals experience greater feelings of abandonment, loneliness, or other depressive symptoms due to institutionalization.

Reform for the Health Care and Health Insurance System

As a society at the late stage of epidemiological transition, China is experiencing a rise in chronic and degenerative diseases, which accounts for an estimated 80 per cent of total deaths in 2005 (Wang et al. 2005). Indeed, the aging of the population alone is predicted to lead to an increase of 200 per cent in cardiovascular diseases between 2000 and 2040 (Leeder et al. 2005). The changes in disease patterns and improved life expectancy are also accompanied by increasing incidence rates of disability with age. A sample survey in 2004 shows that more than a quarter of the adults 80 years and older were physically dependent, compared with around 5 per cent for those who were between 65 and 69 years old (see Fig. 8.5).

These aging and health related issues are likely to become a long-term economic burden for the Chinese society. The government has made serious efforts to tackle these problems from several different angles. In terms of health education and preventive activities, the government started a series of policy initiatives of chronic disease control in the 1990s and early 2000s, including a national cancer control plan, intervention trials of diabetes and hypertension and the establishment of the National Center for Chronic and Non-communicable Disease Control and Prevention (NCNCD) and a number of demonstration sites for chronic disease prevention and control (Wang et al. 2005). The Ministry of Health also established a National Geriatric Institute to conduct scientific research (Woo et al. 2002).



Source: China National Statistical Bureau. 2005. *China Statistical Yearbook 2005*. <http://www.stats.gov.cn/english/>.

Fig. 8.5 Physical dependence among older adults aged 65+ in China, 2004

On another front, the government faces enormous challenges in providing its population adequate access to health care. While China has experienced phenomenal economic growth and a much improved general living standard in recent decades, access to health care has become widely unequal. This increasing gap is a result of the collapse or dysfunction of government health insurance schemes in both urban and rural areas, accompanied by an astounding growth of income inequality (Grogan 1995; Hsiao 1995; Zhao 2006). For example, results from the 2003 National Health Services Survey showed that a large proportion of the population (nearly half of the rural population) failed to receive needed in-hospital medical treatment, the average cost of which approaches one's average annual income (Zhao 2006). It is significant that China's total health expenditures rose from 3.2 per cent to 5.4 per cent of the gross domestic product (GDP), while government health spending as a per cent of GDP declined from 1.1 to 0.8 per cent of the GDP from 1980 to 2002. This suggests that the growing financial burden of health care has largely fallen on the individual (Zhao 2006). The situation stands in sharp contrast to that in the pre-reform era, when there existed a comprehensive level of basic health care provision in both urban and rural areas.

Reform in Urban China

In pre-reform urban China, there were two main health insurance programs financed by the government: the Government Insurance Scheme (GIS), provided to government employees and retirees, staff in cultural, educational, health and research institutes and university teachers, staff and students; and the Labor Insurance Schemes (LIS), provided to state enterprise employees and retirees. Both systems extended full or partial coverage to immediate family members. The GIS and LIS provided effective health care benefits, including inpatient and outpatient services regardless of expense. As for delivery of health care, there are street (sub-district), district and municipal level hospitals – a three-tiered system provided efficient patient referral for care in the most appropriate setting.

However, the market transition beginning in the early 1980s brought major challenges to the health

care system in urban China (see review by Grogan 1995). The breaking of the “iron rice bowl” (a Chinese term referring to occupations with guaranteed job security, income and benefits) meant that state owned enterprises were responsible for their own benefits and losses. Thus, bankrupted or poorly managed enterprises were often unable to provide health benefits to their workers. At the same time, the government introduced a new set of health care system reform policies, which limited public funds available for health care, allowed for private ownership of health facilities and clinical practices and encouraged hospitals and other health facilities that were previously fully supported by the government to cover their own operating costs (Rosner 2004). The government also attempted a series of pilot programs in the 1990s to revamp the old health insurance system. Although there were wide regional variations, the central goal of the reform was that the government and firms should no longer be responsible for most of the health care costs, as they were before (Rosner 2004). Under the new basic health insurance scheme, employees and their work units would jointly pay contributions to a social pooling fund and a personal savings account, with the amount of contribution largely dependent on age, region and wage level. The recent health insurance policy changes helped to separate medical insurance from one’s place of employment, gave patients more freedom in choices of medical facilities and promoted competition amongst medical care providers (Dong 2001). Nonetheless, the new health insurance system had major limitations, including its failure to reduce inequality in health care access, increasing medical costs, poor ability of the central government to implement the scheme and underfinancing of the social pooling fund. Policy makers began to realize that a market oriented approach to the health care sector may not be the best solution, particularly for the disadvantaged sector of the urban population.

Reform of Cooperative Medical Schemes (CMS) in Rural China

Prior to the economic reforms, China achieved remarkable health improvement for its rural population through the rural cooperative medical schemes (CMS) and a three-tiered health care delivery system

(village stations, township health centers and county hospitals). The CMS collected funds from households and communes and received small subsidies from the government. It helped to financially maintain and consolidate a network of health facilities and effectively provided basic health care services to the rural population. It was estimated that over ninety per cent of the rural communes were covered by CMS in the mid 1970s (Feng et al. 1995; Wang et al. 2005). However, the introduction of the household responsibility system in the late 1970s led to the near collapse of rural CMS. With agricultural production being decollectivized, most townships and villages no longer had the funds to finance CMS. Coverage by CMS was reduced to less than 10 per cent of the rural residents in the 1990s, with the majority of the rural population having to pay out of pocket for health care (see review by Liu et al. 1995). Rising medical costs negatively impacted the living conditions of the rural people and greatly increased the risk of illness-induced poverty. Village health stations, once staffed by “barefoot” doctors and provided easy access to services for the majority of the rural population, were sold to individuals or were contracted to private practitioners, with virtually no quality control of the services from the local government (Cook and Dummer 2004). The number of village health workers and village and town health care centers decreased considerably. Further, inequality in access to health care facilities and the health status of populations among rural communities widened.

Meanwhile, the central government adopted a *laissez-faire* policy on rural health care and left the operation and financing of the health facilities largely to the rural population. Starting in the 1980s, a number of Cooperative Health Care Schemes (CHCSs) were set up by some local governments to deal with the issue of access to basic health care in rural areas but they were concentrated in richer areas and were not common at all. It was not until 2003 that a nationwide New Cooperative Medical Scheme pilot project was implemented for the rural population of China (Rosner 2004). By mid 2006, 1399 pilot counties in 31 provinces (half of all counties) were set up (see review by Wang et al. 2006). The goal of the government was to extend the coverage nationwide in 2008 and to guarantee all rural residents with some sort of basic health care by 2010. The funding comes from contributions from voluntary participants (roughly

0.5–1 per cent of their annual income), with additional support from the local villages and the central government.

While it is too early to evaluate the success of these pilot programs, numerous studies noted various sources of difficulty, including uncertainty in funding from the central and provincial governments, inability by poor residents to afford contribution despite its low premium, poor quality of services and overemphasis on risk protection from catastrophic care while overlooking basic health services (Wang et al. 2006). To successfully cope with the rise in health care demands associated with the rapid aging of the rural population, it is vital that the NCMS system should be improved and promoted in the near future.

Pension Reforms

Besides the reform of its health care system, population aging makes the establishment of a well functioning old age security system another equally pressing task for the Chinese government. According to a recent sample survey, only 34.1 per cent of the male population and 17.7 per cent of the female population was covered by any sort of pension scheme (see Fig. 8.6). In contrast, support from family members was a major source of financial support for older men and women. With a falling ratio of workers to pensioners and precarious funding situations, China is undertaking a major overhaul of its old age security system in urban areas and is introducing a new system for the rural population (where they were previously non-existent).

Pension Reforms in Urban China

The first nationwide pension system in China was set up in the 1950s by the central government. It only covered urban workers in state-owned enterprises and government staff. The system had defined benefits at 50–70 per cent of workers' wages and was termed as a "Pay-As-You-Go" (PAYGO) pension scheme, reflecting that state-owned enterprises contributed a portion of their payrolls to a labor insurance pool to pay existing retirees. This scheme disintegrated during the domestic turmoil known as the Cultural Revolution (1966–76). Pension payments were then managed by individual enterprises, with no systematic intervention from the central government and thus pension benefits and contributions varied greatly from one enterprise to another (see review by Gao 2006). A restructuring of the state sector economy in the 1980s nearly dismantled the pension system. As an effort to increase productivity, individual state owned enterprises became directly responsible for profits and losses. Their financial autonomy meant that they often were either unable or unwilling to assume former pension liabilities. At the same time, economic restructuring resulted in a rise in unemployment and underemployment, leading governments at all levels to push for early retirement. For example, over half of the employees who retired in 1999 in a number of big cities in China were under official retirement age, which added more burden to the pension system (Huang 2003). In addition, the private sector of the economy expanded rapidly after economic reforms, with most enterprises not offering any old age pension to their employees.

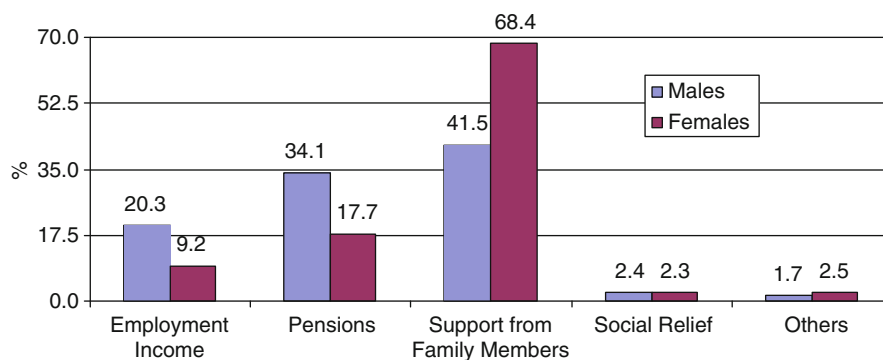


Fig. 8.6 Sources of support among older adults aged 65+ in China, 2004

Source: China National Statistical Bureau. 2005. *China Statistical Yearbook 2005*. <http://www.stats.gov.cn/english/>.

It is against this backdrop that the Chinese government started a major revamping of the old age pension system in the 1990s (see review by Huang 2003; Gao 2006; Wang 2006; Zhu 2002). The government's major goals were: first, to redefine the enterprise financed pension system to a scheme that is financed by the government, enterprises and individuals; and second, to extend the coverage from state owned and collective enterprises to essentially all urban residents. The Chinese government largely followed the World Bank's three pillar financing system by including: 1) a basic pension plan to provide employees with a minimum level of benefit that is financed entirely by the enterprise contribution; 2) a mandatory defined-contribution pillar for accumulating additional benefits by contributions via individual contributions and enterprises; and 3) a voluntary pension pillar offered by private firms (World Bank 1997). The on-going pension reform, while ambitious in its goals, also faces enormous challenges on many fronts. These challenges include its narrow coverage, a funding gap in the overall pension system, a large amount of unfunded liabilities from the old pension system, a huge disparity of pension coverage as a result of the decentralized system and immature capital market development. Finally, the rapid aging of the population in the next thirty years will also put a heavy toll on the work force in supporting the pensioners, particularly when the retirement age in China is set to a low level (55 for most women and 60 for men).

None of the challenges will be easy to address. For example, it seems obvious that the retirement age in China was set too low considering that the life expectancy is 70 and 74 years respectively for men and women. However, raising the retirement age clashes with the downsizing of the state sector and could worsen the unemployment situation (Trinh 2006). Recent statistics from the National Bureau of Statistics suggest that only 46 per cent of urban employees were covered by a pension plan in 2004, with most of these employees concentrated in the state sector (Trinh 2006). However, extending the plan to all urban residents could adversely affect labor costs and consequently wage and employment growth. The lack of incentives to participate by some private enterprises was explained by the fear that their contributions were used to pay the pension liabilities of state owned enterprises. In sum, the road to a successful pension reform in China is likely to be thorny but the demographic

challenges lying ahead call for the government to speed up the reform of its old age security system.

Introduction of a Pension System in Rural China

In rural China, there was virtually no pension system prior to the 1990s. A 1992 national survey done by the China Research Center on Aging showed that 94 per cent of the elderly in rural areas had no pension available for retirement (Qiao 2001). The elderly primarily relied on their children for care and support. However, the informal old age support system that has worked well for thousands of years is endangered. With nearly two thirds of the population living in rural China, the need to provide adequate support for the elderly is acute, particularly under the pressure of declining numbers of children, massive rural-to-urban migration by the young generation and the erosion of traditional family values.

In the late 1980s, the government introduced a number of pilot projects of old age social insurance programs in some developed rural areas. Subsequently the government proposed some basic principles for rural social security insurance in the 1990s. The basic pension system for rural farmers was intended for those between 20 and 60 years of age. It was financed by voluntary personal contributions and supplemented by a collective subsidy and was managed by the county government (see review by Wang 2006). Over 75 million farmers participated in the insurance schemes in 1997. However, a restructuring of the government stalled the development of the rural old age security system, with a decision by the State Council to transform the existing system to a fully commercialized insurance program. In 2006, about 54 million rural laborers participated in the insurance scheme, representing about 12 per cent of the total rural labor force (Xinhua News Agency 2006).

The rural old age pension system, while still largely underdeveloped, has laid a foundation for its further development. It is not only critical to the well-being of an aging rural population but will play a key role in integrating the rural and urban economies through the establishment of an individual contributory account system (Wang 2006). In the context of a widening rural-urban income gap and massive rural to urban migration, it signifies one initial step toward easing the rural-urban divide.

Conclusion

As recently as three decades ago, China's primary population problem was overpopulation. Paradoxically, successful implementation of the family planning policy has effectively controlled the population size but drastically speeded up the aging process, thereby shifting the concern from "too many children to support" to "too few children to support a rapidly aging population" (Kaneda 2006). With a falling dependency ratio and an increasing burden on the health care and social security programs, China is under enormous pressure to meet the demands of an aging society. This is a particularly challenging issue because its per capita income level is less than that of a quarter of the other aging but more developed nations (Population Reference Bureau 2006). China is thus confronting the concurrent tasks of economic development and dealing with population aging. How will China respond to the issue of "growing gray before growing rich"? Who will take care of the elderly?

This chapter highlights some of the major challenges that China is facing. We have shown that the demographic reality in the next two decades will make it impossible to rely solely on the traditional family support system for elder care. Rapid decline of fertility leads to a reduction of family size over time. Even without taking into account possible changes in norms, the traditional living arrangement (parents living with adult children, mostly with a son) cannot be sustained in most families due to fewer available children. The 4-2-1 family pattern, meaning four grandparents, two married persons (one couple) and one child will become increasingly common, making it difficult for children to provide adequate support to family members in need. The substantial rural-to-urban migration will also make the situation worse in rural areas, where the elderly are often left behind, sometimes even with the added responsibility of raising grandchildren whose parents have moved to urban areas.

Facing the prospect of declining family-based old age support, the government has taken the initiative to reform a failing old age social security system in urban China and to introduce a new system for the rural population. The urban reform includes processes such as a new financing scheme shared by the employer (work unit), the employee and the government, expansion of worker coverage from state enterprise employees to the entire urban work force, as well as multiple plans

of benefits rather than the single defined benefit plan. With the shrinking worker-to-retiree ratio as the population ages dramatically in the next several decades, it is crucial to make the urban pension reform financially sound. While promising in its direction, the urban reform is saddled with problems, including burden from the old pension system, reluctance to participate by some individuals and firms due to concerns over the adequacy of funding and underdevelopment of the investment market. Experts have suggested possible routes of improvement, including liberalizing the financial market, centralizing the management of the pension pool and increasing contribution rates. In rural areas, the government has recently begun to promote an old age security system, which is primarily funded by a voluntary savings plan, with possible matching from local government and rural enterprises. Still largely underdeveloped, an old age pension program is urgently needed in rural China to meet the demands of the elderly population, who were supported by an informal old age support system (family) in the past.

In addition to the pension reforms, the government is also engaged in major reforms of its health care and health insurance systems. During its planned economy period, the Chinese government made great achievement in providing basic health services to its population despite its low economic development level. However, as an effort to stimulate economic growth and decentralize the economy, initial reforms of the health care systems proved disastrous. Examples include a collapse of the Cooperative Medical System in rural areas, escalating costs of health care and growing inequality to access of health care. In fact, a 2005 executive summary of the Ministry of Health openly referred to the reform so far as "unsuccessful." The government is currently exploring different ways to strengthen government responsibility in the reforms of its health care and insurance system.

In addition to the on-going public health and social benefits reforms, other policies that are demographic in nature are also recommended by scholars as options to alleviate the increasing pressure from the aging population, including relaxing the one-child policy, encouraging "rural-to-urban" family migration and reforming the *hukou* (household registration system) (Wang 2004B; Qiao 2001; Zeng et al. Forthcoming). To meet the mounting challenges of population aging in the next few decades, comprehensive strategies are needed to address the demand for old age support.

Despite the above mentioned difficulties, there are numerous positive signs. Since the launch of the eco-

economic reforms in 1978, China has experienced the most persistent economic growth ever recorded around the world. Despite some recent slowdown, the annual economic growth rate has been around 9 per cent and reached an unprecedented 13 per cent in several peak years (Lai 2003). Increasing state resources and individual savings provided a solid basis for the reform of the social security and health care systems. Zeng et al. (Forthcoming) suggested that the next twenty five years were a “golden-age” period in that a “demographic window of opportunity” was open, thanks to a large labor force, decreasing numbers of children and a relatively lower proportion of elderly. Wang and Mason (Forthcoming) argued that population aging can lead to increased capital accumulation and saving, which can be materialized into “the second demographic dividend” if proper institutional arrangements are made.

Finally, the deeply rooted cultural tradition of filial piety existed for centuries in China. Despite its erosion in recent years, it is implausible that it will disintegrate any time in the near future. There is plenty of evidence testifying to the cohesive ties and intergenerational solidarity between parents and their adult children in contemporary China. Further, the government is making publicized efforts to preserve the traditional values and reinforce the family obligations. In the coming decades, it is highly likely that a supportive family network will continue to play an indispensable role in fulfilling the responsibility of elder care. A productive alliance between the state and the family is perhaps the best solution to meeting the long-term needs for elder care.

References

- Banister J (1992) A brief history of China's population. In: Dudley LP Jr, Yaukey D (eds) *The population of modern China*. Plenum Press, New York NY, pp 51–57
- Bian F, Logan JR, Bian Y (1998) Intergenerational relations in urban China: Proximity, contact, and help to parents. *Demography* 35:115–124
- Caldwell JC (1986) Routes to low mortality in poor countries. *Popul Dev Rev* 12:171–220
- Chen F (2005) Residential patterns of parents and their married children in contemporary China: A life course approach. *Popul Res Policy Rev* 24:125–148
- Chen S (1996) *Social policy of the economic state and community care in Chinese culture*. Ashgate Publishing Company, Brookfield, USA
- China National Research Center on Aging (CNRCA) (2003) *Data analysis of the sampling of survey of the aged population in China*, China Standard Press, Beijing
- China National Statistical Bureau (2003) *Tabulation on the 2000 population census of the People's Republic of China*. All China Marketing Research Inc., Beijing
- China National Statistical Bureau (2005) *China statistical year-book 2005*. <http://www.stats.gov.cn/english/>
- China Research Center on Aging (1992) *Survey data on China's support system for elderly*. China Research Center on Aging, Beijing
- Cook IG, Dummer TJ (2004) Changing health in China: Re-evaluating the epidemiological transition model. *Health Policy* 67:329–343
- Deborah D, Harrell S (1993) Introduction: The impact of post-Mao reforms on family life. In: Deborah D, Harrell S (eds) *Chinese families in the post mao era*. University of California Press, Berkeley, CA, pp 1–24
- Deborah D-F (1991) *Long lives: Chinese elderly and the communist revolution*. Stanford University Press, Stanford, CA
- Dong W (2001) *Health care reform in urban China. Comparative program on health and society*, Munk Centre for International Studies at the University of Toronto. Working Paper 2001/2
- Feeney G, Feng W (1993) Parity progression and birth intervals in China: The influence of policy in hastening fertility decline. *Popul Dev Rev* 19:61–101
- Fei X (1992) *From the soil: The foundation of Chinese society*, 3rd. University of California Press, Berkeley, CA
- Feng X, Tang S, Bloom G, Segall M, Gu X (1995) Cooperative medical schemes in contemporary rural China. *Soc Sci Med* 41:1111–1118
- Gao Q (2006) The social benefit system in urban China: Reforms and trends from 1988 to 2002. *J East Asian Stud* 6:31–67
- Grogan C (1995) Urban economic reform and access to health care coverage in the People's Republic of China. *Soc Sci Med* 41:1073–1084
- Gu D, Dupre ME, Liu G (2007) Characteristics of the institutionalized and community-residing oldest-old in China. *Soc Sci Med* 64:871–883
- Gu D, Zeng Y (2004) Sociodemographic effects on the onset and recovery of ADL disability among Chinese oldest-old. *Demo Res* 11:1–42
- Hsiao WC (1995) The Chinese health care system: Lessons from other nations. *Soc Sci Med* 41:1047–1055
- Huang J (2003) Economic restructuring, social safety net, and old-age pension reform. *Am Asian Rev* 21:171–198
- Ikegami N, Yamauchi K, Yamada Y (2003) The long term care insurance law in Japan: Impact on institutional care facilities. *Inter J Geriatr Psychiatry* 18:217–221
- Ikels C (1997) Long-term care and disabled elderly in urban China. In: Sokolovsky J (ed) *The cultural context of aging: Worldwide perspectives*, 2nd edn. Bergin and Garvey, Westport, CT, pp 452–471
- Joseph AE, Phillips DR (1999) Ageing in rural China: Impacts of increasing diversity in family and community resources. *J Cross-Cul Gerontol* 14:153–168
- Kaneda T (2006) China's concern over population aging and health. <http://www.prb.org/Articles/2006/ChinasConcernOverPopulationAgingandHealth.aspx>. accessed on January 29, 2007
- Kim E-Y, Kim C-Y (2004) Who wants to enter a long-term care facility in a rapidly aging non-western society? Attitudes of older Koreans toward long-term care facilities. *J Am Geriatr Soc* 52:2114–2119

- Lai P (2003) China's economic growth: New trends and implications. *China World Econ* 11:9–15
- Lawton MP, Moss M, Kleban MH (1984) Marital status, living arrangements and the well-being of older people. *Res Aging* 6:323–345
- Lee LM (2004) The current state of public health in China. *Annu Rev Public Health* 25:327–339
- Leeder S, Raymond S, Greenberg H, Liu H, Esson (2005) A race against time: The challenge of cardiovascular disease in developing economies. Columbia University, New York
- Leung JCB (1997) Family support for the elderly in China: Issues and challenges. *J Aging Soc Policy* 9:87–101
- Li J (1995) China's family planning program: how, and how well it? A study of Hebei province, 1979–1988. *Popul Dev Rev* 21:563–585
- Liang Z, Ma Z (2004) China's floating population: New evidence from the 2000 Census. *Popul Dev Rev* 30:467–488
- Liu Y, Hsiao WCL, Li Q, Liu X, Ren M (1995) *Soc Sci Med* 41:1085–1093
- Logan JR, Bian F (1999) Family values and co-residence with married children in urban China. *Soc Forces* 77:1–30
- Logan JR, Bian F, Bian Y (1998) Tradition and change in the urban Chinese family: The case of living arrangements. *Soc Forces* 76:851–882
- Merli MG, Smith HL (2002) Has the Chinese birth planning program been successful in changing fertility preferences? Evidence from linked records in three data sources in four counties of Northern China. *Demography* 39:557–572
- Ministry of Civil Affairs (2005) China civil affairs' statistical yearbook. China Statistics Press, Beijing
- Palmer M (1995) The re-emergence of family law in post-Mao China: marriage, divorce and reproduction. *China Quarterly* 141:110–134
- Parish WL, Whyte MK (1978) Village and family in contemporary China. University of Chicago Press, Chicago, IL
- Population Reference Bureau (2006) World population data sheet. <http://www.prb.org/Publications/Datasheets/2006/2006WorldPopulationDataSheet.aspx> accessed on January 29, 2007
- Poston D (2000) Social and economic development and the fertility transitions in mainland China and Taiwan. *Dev Rev* 26(suppl):40–60
- Poston D (1992) Fertility trends in China. In: Dudley LP Jr, Yaukey D (eds) *The population of modern China*, Plenum Press, New York, NY, pp 277–286
- Qiao X (2001) Aging issues and policy choices in rural China. Paper presented at the 26th IUSSP General Population Conference, Salvador, Brazil
- Rosner HJ (2004) China's health insurance system in transformation: Preliminary assessment, and policy suggestions. *Int Soc Secur Rev* 57:65–90
- Sarwari AR, Fredman L, Langenberg P, Magaziner J (1998) Prospective study on the relation between living arrangement and change in functional health status of elderly women. *Am J Epidemiol* 147:370–378
- Short SE, Zhai F (1998) Looking locally at China's one-child policy. *Stud Fam Plann* 29:373–387
- Tien HY (1984) Induced fertility transition: impact of population planning and socio-economic change in the People's Republic of China. *Popul Stud* 38:385–400
- Trinh T (2006) China's pension system: Caught between mounting legacies and unfavourable demographics. Deutsche Bank Research, Germany
- United Nations (Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat) (2005) World population prospects: The 2004 revision population database. <http://esa.un.org/unpp/>
- Wang D (2004 a) Ritualistic coresidence and the weakening of filial practice in rural China. In *Filial piety: Practice and discourse in contemporary east Asia*. Stanford University Press, Stanford, California, pp 16–33
- Wang D (2006) China's urban and rural old age security system: Challenges and options. *China and World Economy* 14:102–116
- Wang F-L (2004 b) Reformed migration control and new targeted people: China's Hukou system in the 2000s. *China Quarterly* 177:115–132
- Wang F, Mason A (2004) The demographic factor in China's transition. Paper presented at the Conference on China's Economic Transition: Origins, Mechanisms, and Consequences. Pittsburgh, PA
- Wang F, Mason A (2007) Population aging in China: Challenges, opportunities, and institutions. In: Zhao Z, Guo F (eds) *Transition and challenge: China's population at the beginning of the 21st century*. Oxford University Press, Oxford, pp 177–196
- Wang H, Gu D, Dupre ME, Gao H (2006) Factors associated with enrollment, satisfaction, and sustainability of the new cooperative medical scheme in rural china. Working Paper
- Wang L, Kong L, Wu F, Bai Y, Burton R (2005) Chronic diseases 4: Preventing chronic diseases in China. *Lancet* 366:1821–1824
- Whyte MK (ed) (2003) *China's revolutions and intergenerational relations*. Ann Arbor, Michigan: Center for Chinese Studies, University of Michigan
- Winckler EA (2002) Chinese reproductive policy at the turn of the millennium: Dynamic stability. *Popul Dev Rev* 28:379–418
- Woo J, Wok TK, Sze FKH, Yuan HJ (2002) Ageing in China: Health and social consequences and responses. *Inter J Epidemiol* 31:772–775
- World Bank (1997) *Old age security: Pension reform in China*. The World Bank Press, Washington, DC
- Wu Z, Schimmele CM (2005) Psychological disposition and self-reported health among the oldest old in China. *Ageing Soc* 25:1–17
- Xinhua News Agency (2006) China to set up old-age security system in rural areas, <http://www.china.org.cn/english/government/192089.htm>. accessed on January 29, 2007
- Yang H, Chandler D (1992) Intergenerational relations: Grievances of the elderly in rural China. *Comp Fam Stud* 23:432–453
- Zeng Y, Wang Z (2003) Dynamics of family and elderly living arrangements in China: New lessons learned from the 2000 Census. *China Rev* 3:95–119
- Zeng Y, Vaupel JW, Xiao Z, Zhang C, Liu Y (2002) Sociodemographic and health profiles of the oldest old in China. *Popul Dev Rev* 28:251–273
- Zeng Y, Wang Z, Leiwen J, Gu D (Forthcoming) Projection of family households and elderly living arrangement in the context of rapid population aging in China-A demographic

- window of opportunity until 2030 and serious challenges thereafter. *GENUS*
- Zhang H (2004) Living alone' and the rural elderly strategy and agency in Post-Mao rural China. In *Filial piety: Practice and discourse in contemporary East Asia*. Stanford University Press, Stanford, California, pp 63–87
- Zimmer Z (2005) Health and living arrangement transitions among China's oldest old. *Res on Aging* 27:526–555
- Zhu Y (2002) Recent developments in China's social security reforms. *International Social Security Review* 55:39–54
- Zunzunegui MV, Beland F, Otero A (2001) Support from children, living arrangements, self-rated health and depressive symptoms of older people in Spain. *Inter J Epidemiol* 30:1090–1099

Chapter 9

Population Aging in the Koreas

Dudley L. Poston and Mary Ann Davis

Introduction

Auguste Comte, the French mathematician, philosopher and the founder of sociology, is believed to be the first person to write that, “Demography is destiny”. Although Comte focused mainly on the effects on the society of increases and decreases in fertility, the general phrase means that population numbers and the changing composition of their members have important and lasting impacts. Demography is destiny precisely because once the demographic shifts and changes have occurred, the future is set. Based on the demographic events that have occurred, astute observers are able to figure out what will happen in the future, or at least what might happen in the future, before the events of the future actually occur.

This chapter deals with the demographic destinies of South Korea and North Korea, with particular focus on its elderly. We present a series of demographic accounts, actual and projected, of the total, older and oldest old populations of South Korea and North Korea and compare them with those for the world. We show that the absolute and relative numbers of older and oldest old in the two Koreas, particularly in South Korea, will increase dramatically by the year 2050. The major factor responsible for the very large projected increase in old proportion in South Korea and North Korea is the rapid fertility transition experienced in both countries since the 1960s and the 1970s. We also examine the dependency ratios for the two countries and show that the dependency burdens on their producing populations will become very heavy in coming decades. We also focus in this chapter on the demographic dynamics of South Korea’s three

largest cities, Seoul, Pusan and Daegu. The aging and dependency burdens in the next several decades that will face these three large South Korean cities are projected to be even more profound than those projected for the country of South Korea. In the last part of the chapter we draw out some the implications of these demographic trends for the provision of eldercare in North Korea and in South Korea and in South Korea’s three major cities.

In the year 2000, South Korea had a population of over 47 million people and North Korea over 21 million. Of even greater interest for this chapter is the size of the older and oldest old populations of the two Koreas. In this chapter we follow the practice of the U.S. Bureau of the Census (Velkoff and Lawson 1998) and refer to the older population as persons aged 60 and over and the oldest old as those aged 80 and over.

In the world in 2000 there were over 600 million older persons and over 70 million oldest old. In South Korea and in North Korea there were over 5.1 million and almost 2.4 million, older persons, respectively. South Korea in 2000 had just under 460,000 oldest old and North Korea had but 152,000. Of the 5.1 million older persons living in South Korea in 2000, 890 thousand were in Seoul, 370 thousand in Pusan and almost 238 thousand in Daegu (see Table 9.1).

These are but small fractions of the total number of oldest old in the world in 2000. (Unless otherwise noted, the data in this chapter on population size and age composition for 2000 and projected years for South Korea and North Korea are from the U.S. Bureau of the Census (2000) international data base. The data for the cities of Seoul, Pusan and Daegu are from the Korea National Statistical Office (2007).)

Since the late 1950s and early 1960s, South Korea and North Korea and the three South Korean cities have all experienced very dramatic declines in fertility. In the early 1960s both Koreas and the three South

D. L. Poston, Jr. (✉)
Sociology Department
Texas A&M University, College Station, TX, USA
E-mail: d-poston@tamu.edu

Korean cities all had total fertility rates (TFRs) above 6.0. At the start of this new century, their TFRs were either near the replacement level of 2.1 (North Korea), or considerably below replacement (South Korea and its three cities). And by the year 2005, South Korea's TFR of just over 1.2 was one of the lowest fertility rates of any country in the world. These rapid declines in fertility are striking and will result in very large increases in the proportions of old in the populations in the decades of this new century.

Population Projections of the Elderly Populations

We now examine population projection data for the two Koreas through the year 2050 that were developed by the U.S. Bureau of the Census (2000). We also examine projection data through the year of 2030 for South Korea's three largest cities with data developed by the Korea National Statistical Office (2007).

We first consider briefly the assumptions behind the projections for South Korea and North Korea. A cohort

component approach is used to project the populations; this method "follows each cohort of people of the same age throughout its lifetime according to its exposure to mortality, fertility, and migration" (U.S. Bureau of the Census 1999: B-3). The baseline for the South Korean projections starts with age and sex data from their 1990 census. Also used are official life tables, by sex, for 1991 (Korea National Statistical Office 1995). South Korea's life expectancy at birth (e_0) for around 1990 is set at about 68 years for males and 73 for females. It is assumed to follow a logistic curve reaching an upper asymptote in 2050 for males of 81 and for females of 87. Using baseline data for births, the TFR of 1.7 in 2000 is assumed to remain at the current level of 1.7 through 2050. The reported data on births by sex for South Korea show abnormally high sex ratios at birth (SRB), as high as 117 in 1990. Official data indicate that the SRB dropped to 113 in 1991 and then rose again to 114 in 1992 (Korea National Statistical Office, 1995). The projections for South Korea assume that the SRB remains at about 114 through 1995 and then declines linearly to 106 by 2020 and remains at 106 through the end of the projection period in 2050. Small allowances are also made in the South Korean

Table 9.1 Total population, older population (age 60+) and oldest old population (age 80+): South Korea, North Korea and the World, 2000 and 2010 to 2050; and Seoul, Pusan and Daegu, 2000 and 2010–2030

Year	Total	Older	Oldest Old
South Korea			
2000	47,470,969	5,143,263	459,815
2010	51,097,083	7,188,068	830,368
2020	52,977,940	10,548,043	1,512,950
2030	53,762,889	14,204,015	2,231,261
2040	53,156,733	16,570,682	3,651,999
2050	51,147,663	16,804,119	4,959,824
North Korea			
2000	21,687,550	2,335,951	152,523
2010	23,753,073	3,207,355	313,858
2020	25,143,231	3,969,269	634,809
2030	26,141,415	5,689,892	889,383
2040	26,600,232	6,694,689	1,221,717
2050	26,388,317	7,367,939	1,976,946
World			
2000	6,079,727,906	605,193,937	70,690,029
2010	6,823,153,417	758,152,702	104,888,292
2020	7,517,468,901	1,024,074,969	142,172,603
2030	8,139,738,692	1,362,741,610	198,903,705
2040	8,667,713,850	1,671,813,521	296,688,152
2050	9,103,445,082	1,985,523,880	415,736,479

Source of Data: U.S. Bureau of the Census. 2000. Census Bureau International Database. Available at <http://www.census.gov/cgi-bin/ipc/idbagg>

Table 9.1 (continued)

Year	Total	Older	Oldest Old
Seoul			
2000	10,078,434	890,120	77,252
2010	9,868,831	1,401,153	136,723
2020	9,508,401	2,111,142	275,666
2030	9,025,667	2,651,532	476,312
Pusan			
2000	3,732,630	370,101	26,684
2010	3,572,797	587,241	60,311
2020	3,391,929	896,245	122,709
2030	3,189,808	1,077,375	202,326
Daegu			
2000	2,528,863	237,667	18,933
2010	2,577,097	365,860	39,771
2020	2,557,246	569,694	82,760
2030	2,476,782	759,593	128,327

Source of Data: Korea National Statistical Office (2007).

projections for the international migration of Koreans to the United States, from the reported 18,000 in 1993 to zero by 2020.

On December 31, 1993, North Korea conducted its first census since 1945. Baseline data are available on the size of the population by age and sex, as well as on the numbers of deaths and births during the 12 months prior to the census. The TFR is estimated at about 2.3 for 2000 with levels previously as low as 1.6 in 1998, owing to the impact on the birth rate of food shortages in the country in the 1990s. An increase in fertility is thought to have occurred by 2000 to make up for births lost during the famine. After 2000, the TFR is assumed to decline to 1.8 by 2005 and to 1.7 by 2050. Unlike the situation in South Korea, there is no evidence in the North Korean baseline data of abnormally high SRBs (see Goodkind (1999) and Poston et al. (2000) for discussion). The North Korean SRBs are assumed to be normal at around 105 throughout the projection period.

Regarding mortality in North Korea, a model life table for the Far East region (United Nations 1983) was used to estimate 1993 levels. The military population of North Korean males is estimated for 1993 to be in excess of 652,000. These males are hence missing from North Korea's age distribution data of the non-military. Thus, the 1993 levels of mortality for the entire population were developed using death data for females only; a corresponding model life table was then used for males. Excess mortality for the famine years in the 1990s was also entered into the baseline

data, as well as assumptions. The death rates for 1994 were assumed to be the same as for 1993; excess mortality for 1995 and 1996 was assumed to be the same proportionally as in China in 1959 and 1960 (the first years of China's great famine). The death rates for 1996 are assumed to be the same in 1997. After 1997, mortality is expected to decline and reach the 1993 levels in 2000. To obtain life expectancies after 2000, it is assumed that by the year 2050 the values of e_0 in North and South Korea will be identical, reaching an upper asymptote in 2050 for males of 81 and for females of 87. International migration to or from North Korea is assumed to be zero throughout the projection period.

Finally, regarding the projections for Seoul, Pusan and Daegu developed by the Korea National Statistical Office, we use data from 2000 to 2030. These thirty-year data are based on the assumption of a continuation of the fertility, mortality and migration trends experienced in the three cities between 1990 and 2000.

We deem these to be reasonable assumptions. But it is nevertheless appropriate to echo Frisbie's observation that "anyone who speculates on what the future holds is well-advised to concentrate on dates as far removed from the present as possible, since the longer the prognostication interval, the fewer the number of critics who will remember and point out errant predictions" (Frisbie 1986: 1).

Table 9.1 shows population projections of the total populations, the older populations and the oldest old populations of South Korea, North Korea and the world

for the decennial years of 2010–2050 and for the three South Korean cities for the years of 2010–2030.

By the mid-point of the twenty-first century there are projected to be nearly two billion older persons in the world out of a total population of over 9.1 billion. In South Korea in 2050, there are projected to be almost 17 million older persons, out of a total population of over 51 million. In North Korea the projections suggest a population of older persons of almost 7.4 million, in a total population of over 26 million. In 2050, in both South Korea and in North Korea, there will be more than three times as many older persons than there were in the two countries in 2000.

In the world in 2050, the projections suggest over 415 million oldest old people, whereas in South Korea there will be over 4.9 million oldest old persons, or almost 11 times as many oldest old as there were in South Korea in 2000. In North Korea in 2050, there are projected to be almost 2 million oldest old, more than 13 times as many oldest old as in 2000.

In 2030 there are projected to be almost 1.4 billion older persons (of age 60 and over) in the world; over one per cent of them (over 14 million) will be residing in South Korea. In 2030, over 2.6 million older persons will be living in Seoul, over 1 million in Pusan and almost 800 thousand in Daegu. In 2030, South Korea, Seoul, Pusan and Daegu are all projected to have three times more older persons than in the year 2000.

In the world in 2030, there are projected to be almost 200 million oldest old people (of age 80 and over), with 1.3 per cent of them (over 2.2 million) living in South Korea. Of these persons age 80 and over in South Korea in 2030, almost 500 thousand will be living in Seoul, over 202 thousand in Pusan and 128 thousand in Daegu. The number of oldest old persons living in Seoul in 2030 will be more than six times greater than the number of oldest old in Seoul in 2000. Pusan and Daegu are projected to have slightly more, or slightly less, than seven times more oldest old persons in 2030 than in 2000.

In the preceding pages we have presented a series of demographic accounts, actual and projected, of the total, older and oldest old populations of South Korea, North Korea and South Korea's three largest cities. The absolute and relative numbers of the older and oldest old populations in South Korea, North Korea and the three big cities will increase tremendously in the years

of this new century. Korea, however, was never a country with a large number of elderly. In the next section of this chapter we look at Korea's demographic past prior to the onset of the colonial administration. We also consider the major factor responsible for the very large projected increase in the proportion of elderly in the two countries and the three cities, namely, the dramatic fertility transitions they experienced since the 1970s. We then consider the very heavy dependency burdens on their producing populations and we also show that these burdens will become even heavier in the decades ahead.

Population Growth Over Time in Korea

South Korea and North Korea are currently completing their demographic transitions from high rates of fertility and mortality to low rates. They are now in the third phase of the transition, low fertility and low mortality. In the last four decades, the two Koreas and South Korea's three big cities have experienced fertility transitions as rapid as any ever experienced in the world.

South Korea has undergone a rapid fertility decline since the government's economic planning program was adopted in 1962. This fertility decline in South Korea is due to both economic development and family planning programs (Poston and Kim 1992). U.S. Census Bureau database data presented in Fig. 9.1 show the country's total fertility rate declined from around 6.0 in 1962 to 1.27 in 2006. Although North Korea has not experienced the same economic development, its TFR has begun to mirror that of her more developed neighbor. Initially North Korea maintained higher fertility. From 1960 to 1973, the TFR in North Korea was above 5. The TFR decline in North Korea then started to follow the same pattern as South Korea but at a slower pace. Although the TFR fell below 2 from 1996 to 1998 during the famine, it rebounded to above replacement level in 1999 maintaining a TFR of 2 or above, with a 2006 TFR of 2.1. Although there has been a relatively rapid decline in fertility in South Korea in recent years, the country has been growing each year by about 400,000 people. We provide some historical perspective for viewing these current demographic dynamics.

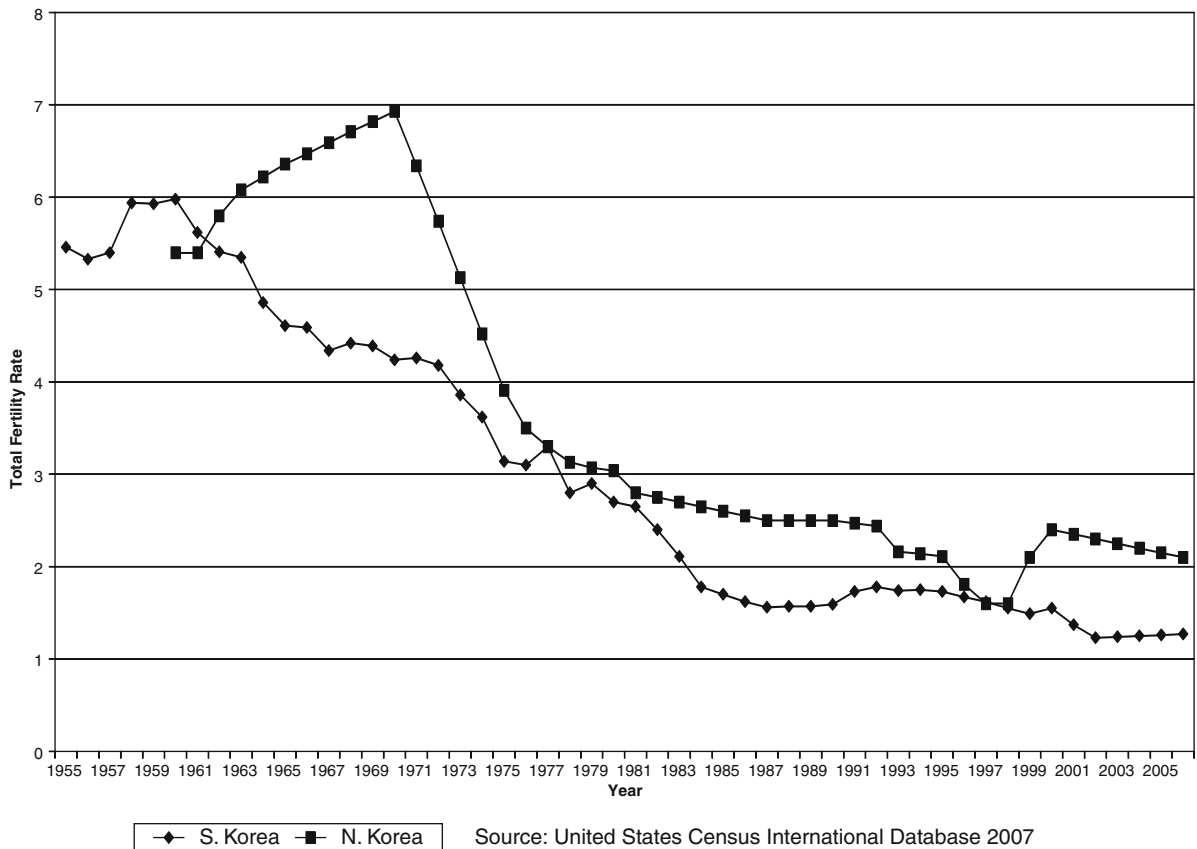


Fig. 9.1 Total fertility rate, North Korea and South Korea, 1955–2006

Korea, a peninsular country located in East Asia, has a long history going back many thousands of years. Although it has suffered from foreign invasion and domination, it has succeeded in maintaining and preserving its culture, language, values and traditions. Culturally, Korea has been influenced by a Confucianism that is significantly oriented toward a pre-modern and agricultural society. However, the traditional culture and values have changed dramatically in this century, primarily due to the influence of western culture. This is particularly true in South Korea.

Until modernity, there was only minimal population change. With modernity the population of Korea began an increase. Korea numbered about 2.3 million persons in 1650 and grew to almost 8.8 million by the 1830s and to 10 million by the 1860s. By 1910, Korea had a population of about 15 million and more than 20 million by 1930 (Nahm 1988: 105, 229).

The Yi Dynasty began in 1392 and ended when Japan colonized the Korean peninsula in 1909. During the initial years of the Yi Dynasty there was mini-

mal population increase, because of high fertility and high mortality (Lee 1979); this is commonly referred to as Korea's pre-demographic transition era. Japan's occupation, which lasted for over 35 years, ended with the defeat of Japan in World War II. During Japan's occupation, Korea's population grew largely as a response to the introduction of medical technology rather than to improvements in living standards. With the end of World War II, the Soviet Union occupied the northern part of Korea along the 38th parallel and an ideological struggle led to the political and geographical division of the peninsula (Poston and Kim 1992).

In 1950, the Korean War broke out and lasted for three years and for all practical purposes destroyed Korea both economically and socially. As a result, by the mid-1950s, Korea was one of the poorest countries in the world (Cho et al. 1982). When the military government assumed control in South Korea in 1961, the country's rate of recovery was slow and annual per capita income was only about US \$82. However, a dra-

matic change occurred in the country after the South Korean government introduced its five-year economic development plan in 1962; economic growth continued through the mid-1990s. Increases in productivity, combined with a labor force increasing at 3.6 per cent annually and the gradual reduction of unemployment, produced an average annual growth rate in GNP of over 10 per cent.

By the end of the twentieth century, South Korea had a per capita GNP of \$10,500 (there are no comparable GNP data for North Korea). The U.S. had a per capita GNP of over \$29,000; Japan's and Switzerland's are the highest of any country in the world, at over \$38,000 and \$43,000, respectively (Population Reference Bureau 1999).

There are many indicators showing the dramatic changes that have occurred in South Korea during the last three decades. The population increased by 62 per cent between 1960 and 1985 from almost 25 million to over 40 million and today numbers over 47 million. The average annual inter-censal growth rates have declined rapidly from 2.7 per cent during the early 1960s to about one per cent during the 1980s and 1990s.

Historical demographic analysis suggests that prior to the onset of colonial administration in Korea, the country's population was at stationary levels (Chang 1966; Kim 1966). Death rates were very high because of poor health conditions, low levels of living and the lack of public health systems. According to Lee (1979), the crude death rate during the nineteenth century, and the beginning of the twentieth, hovered around 35 deaths per thousand, with an expectation of life at birth of about 35 years.

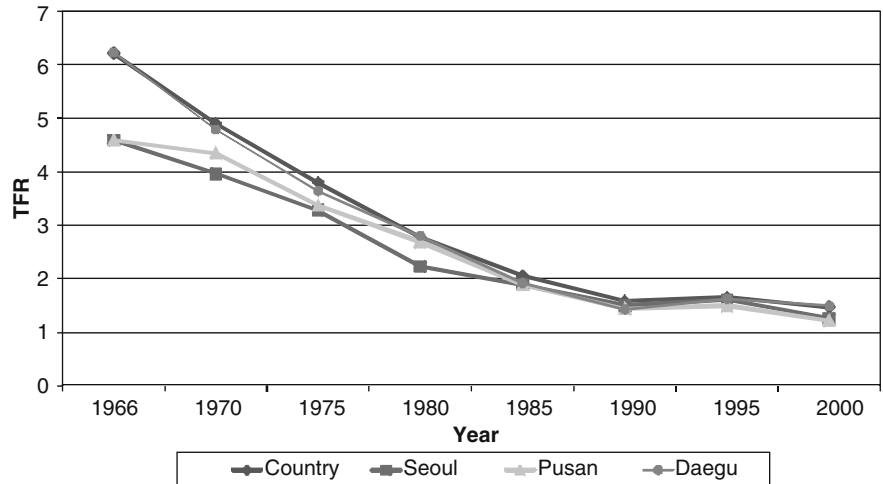
The crude birth rate in Korea was probably between 35 and 40 per thousand during the nineteenth century. In earlier days, the great majority of the population suffered from low levels of living, malnutrition and poor health conditions. Consequently, the high death rate helped sustain a very pro-natalist view regarding population. Further, Confucian ideology accelerated the pro-natalist view because of its idealization of the extended family based on succession through sons. Universal marriage prevailed.

The traditional stability of Korean population trends began to break down with the launching of the Japanese colonial administration in 1910. The first decade (1910–1920) was characterized by an incipient mortality decline, which continued throughout the colonial period. As a result, the crude death rate declined from

34 in the 1910–1915 period to 23 in the 1940–1945 period. This reduction was mainly due to advances in modern medicine, especially public health facilities geared to the prevention of epidemics and infectious diseases (Lee 1979). As mentioned earlier, Korea's steady decline in mortality was less influenced by improvements in the standard of living, as was the case in many Western European countries in the nineteenth century, than by medical improvements.

World War II and the concomitant ending of the Japanese colonial rule in 1945 divided Korea into two parts along the 38th parallel. From this time on, it is not possible to track the population trends of the entire Korean peninsula. The bipartition of the peninsula also resulted in a polarization of ideology and a disorganization of economic life through the breakdown of the single political and economic unit. The Korean War, which broke out in 1950, had devastating effects on virtually all aspects of Korean society. From 1945 until the end of the Korean War in 1953, most Koreans experienced a marked reduction in their reproductive behavior. The 1955 census indicated only a slight increase in population size from 20.2 to 21.5 million, representing an average growth rate of 1 per cent per year from 1949 to 1955 (Lee 1979); the TFR in South Korea in 1955 was 5.5 (Fig. 9.1). However, as already noted, fertility began declining in the 1960s in South Korea and the TFR in 2005 was one of the lowest of any country in the world. The TFR in South Korea has been below replacement level since 1984 and was just over 1.2 in 2005 (see Fig. 9.1). Our knowledge of the fertility dynamics in North Korea is limited as population information from North Korea is sparse. The TFR data shown in Fig. 9.1 are estimates developed by the U.S. Census Bureau (2007). The TFR was 5.4 in 1960 but increased to around 7 by 1970 following the country's pro-natalist campaigns. Fertility began to fall in the 1970s and is estimated to have been at or below replacement levels by 1993, reaching a low of 1.6 in 1997. These very low fertility rates were not a consequence of a fertility reduction campaign but were caused by the food shortages in North Korea in the 1990s. The U.S. Census Bureau estimates that the TFR increased to above 2.0 in 1999, was 2.4 in 2000 and 2.2 in 2004. Presumably, for several years after 1998 many North Korean couples endeavored to make up for births that were lost or foregone during the famine years. By 2005 the TFR had decreased to 2.15.

Fig. 9.2 Total fertility rates: South Korea, Seoul, Pusan, and Daegu, 1966–2000



Source of Data: Korea National Statistical Office (2007)

Figure 9.2 shows total fertility rates from 1966 to 2000 for South Korea and its cities of Seoul, Pusan and Daegu. We selected these three cities in South Korea as they typify regional differences in fertility as well as the increased urbanization of South Korea. Kim (2002) notes that Daegu has the distinct characteristics of being a conservative area historically linked with being the base of politically elite males. Seoul has been heavily influenced by the large United States military presence and has a more liberal and Christian population. Pusan in the southern area is a port city with a history of international trade. In 1966 the total fertility rates of both the country of South Korea and the city of Daegu were above six children per woman and the fertility rates of Seoul and Pusan were both in excess of 4.5 children per woman. Between 1966 and 1980 fertility declined in a linear fashion for the three cities to levels between 2.2 and 2.8. Fertility continued to decline but at a less rapid pace from 1980 to 2000. In 2000 Daegu had a TFR of around 1.5 children per woman, Seoul had a TFR of 1.3 and Pusan had a TFR of 1.2.

Both Korea and the cities of Seoul, Pusan and Daegu have experienced dramatic reductions in their birth rates. The reductions experienced in South Korea and its three big cities were more a result of voluntary factors than was the case in North Korea. But despite the differences causing these reductions, both countries and the three cities now have very low fertility rates. And it is these rapid declines in the fertility rates in the 1970s and the 1980s that will pro-

duce in the decades of this new century a very large proportion of elderly people in the populations of both Korea and in the three cities. Since the 1980s in South Korea and its three big cities and since the early 1990s in North Korea, fertility has been at or below replacement levels. Birth cohorts are considerably smaller now than they were a few decades ago. If the below replacement fertility continues, coupled with current and projected gains in longevity, in the coming decades there will be an increasing percentage of the elderly and a decreasing percentage of younger persons in the population.

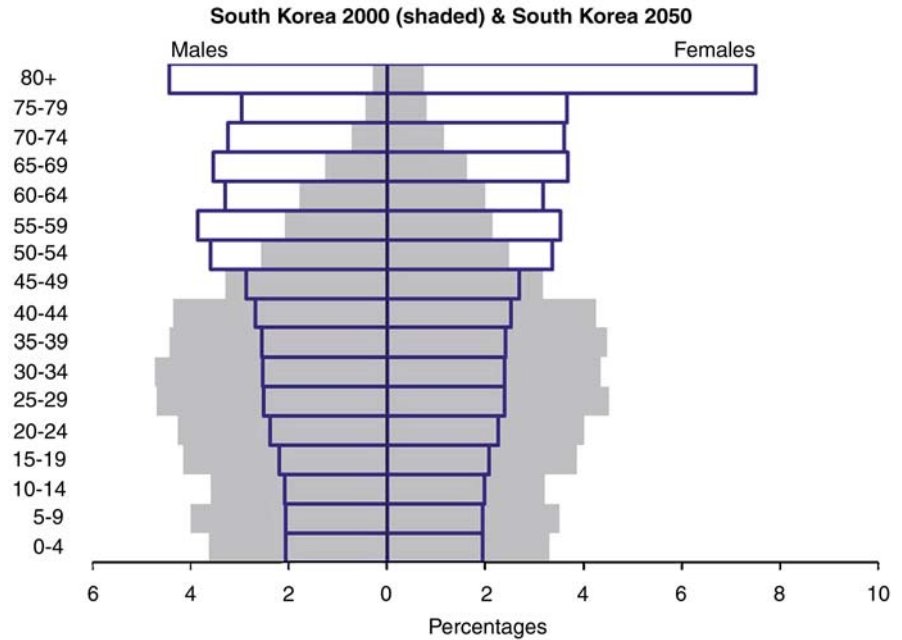
We turn now to a consideration of the projected dependency burden on the producing populations of South Korea and North Korea and Seoul, Pusan and Daegu.

Dependency and Aged Dependency

Dependency ratios and aged dependency ratios are important in considering the economic, social and physical burden of caring for the older population. We show below the current dependency burdens in South Korea and North Korea and in Seoul, Pusan and Daegu and how these will increase in the years ahead.

We begin by looking at the age and sex distributions of the countries' total populations today and in the future. We use population pyramids, which are graphic representations of the age and sex distributions

Fig. 9.3 Stacked population pyramids: South Korea 2000 and 2050



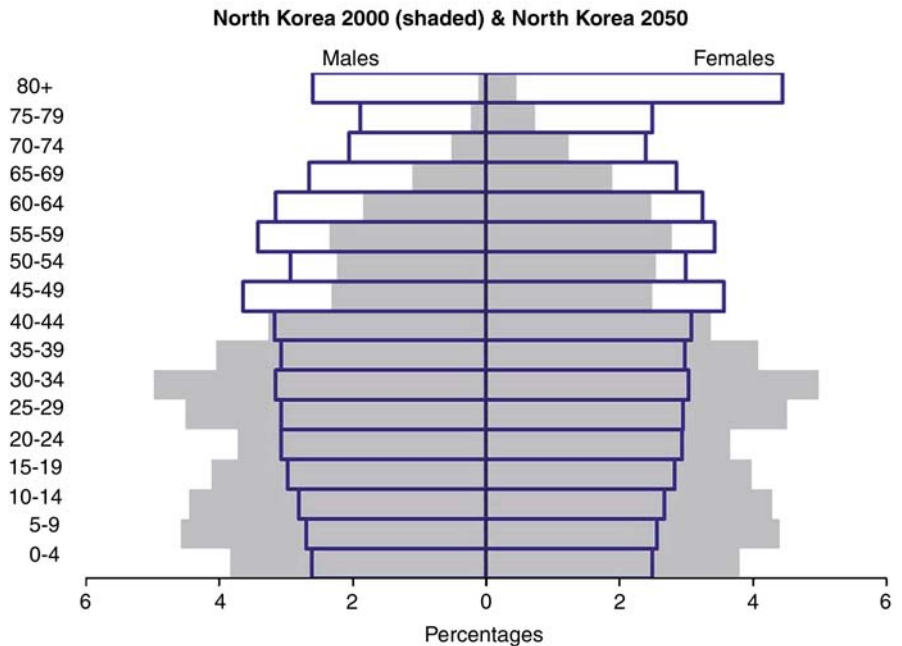
Source of Data: United Nations, http://unstats.un.org/unsd/cdb/cdb_advanced_data_extract_fm.asp

of populations. A population pyramid is a graph of age data (males on the left, females on the right) vertically arranged in (usually 5-year) age groups from the bottom (age zero) to the top (age 80 and over). The horizontal line (the base) of the pyramid represents size

and is calibrated in terms of the percentage of the total population represented by each age-sex group.

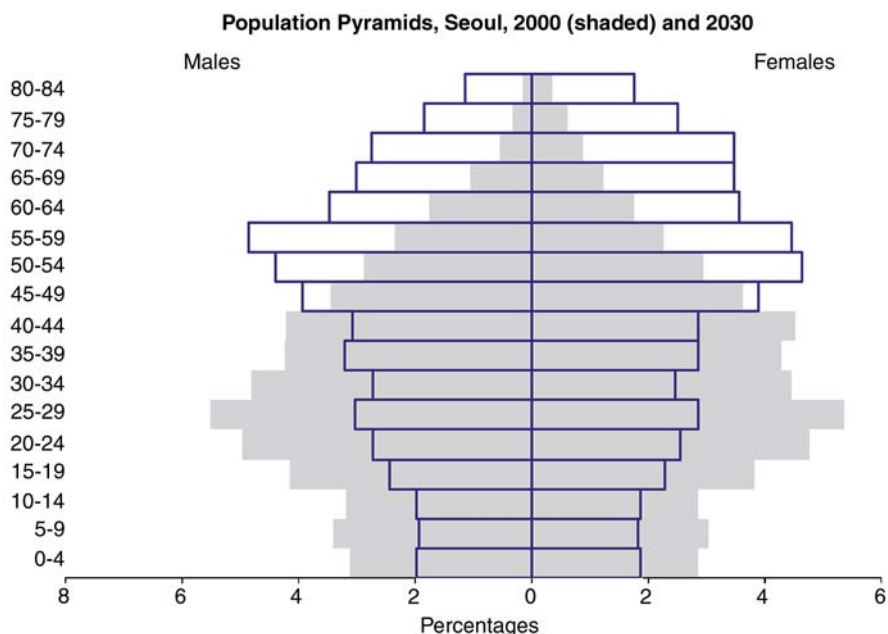
Figures 9.3 and 9.4 show pairs of stacked population pyramids for South Korea and North Korea, respectively, for the years of 2000 and 2050 (see Rowland

Fig. 9.4 Stacked population pyramids: North Korea, 2000 and 2050



Source of Data: United Nations, http://unstats.un.org/unsd/cdb/cdb_advanced_data_extract_fm.asp

Fig. 9.5 Population pyramids: Seoul, 2000 (Shaded) and 2030



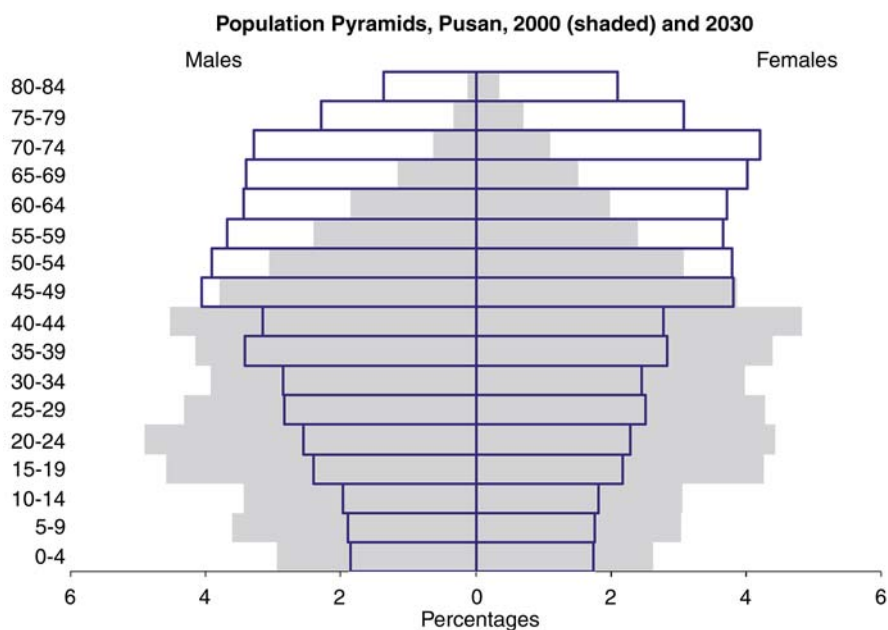
Source of Data: Korea National Statistical Office (2007)

2003, for software for producing stacked pyramids). The 2000 pyramid is shaded. Figures 9.5–9.7 show pairs of stacked pyramids for Seoul, Pusan and Daegu for the years of 2000 and 2030.

We first view the 2000 pyramid for South Korea (Fig. 9.3). Its age and sex structure as of 2000 tell us

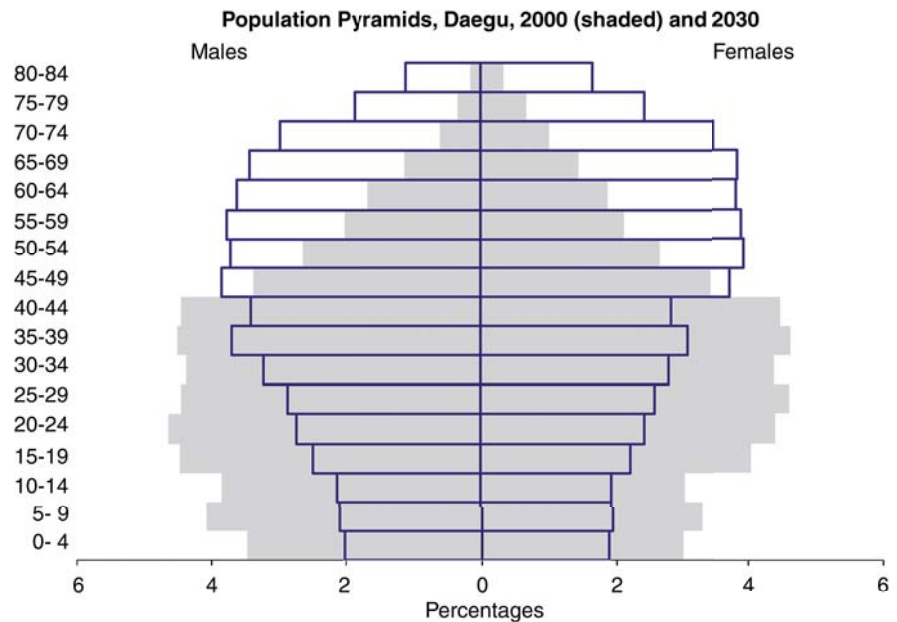
a great deal about its recent demographic history. The larger birth cohorts born in the mid-1960s and into the early 1970s in South Korea are shown by the extensions of the male and female bars at ages 25–29, 30–34 and 35–39. The enhanced female versus male life expectancy is reflected in the excess numbers of females at the

Fig. 9.6 Population pyramids: Pusan, 2000 (Shaded) and 2030



Source of Data: Korea National Statistical Office (2007)

Fig. 9.7 Population pyramids: Daegu, 2000 (Shaded) and 2030



oldest ages. And the effects of the lower fertility rates in the late 1980s and 1990s are seen in the indented male and female bars at ages 0–4, 5–9 and 10–14.

Also, in virtually every known society more males are born than females, usually 105 males are born for every 100 females. But in South Korea, as in China and Taiwan and a few other countries, in the past 10–15 years there have been many more sons born than daughters (Hull 1990; Park and Cho 1995; Kim 1997; Poston et al. 1997, 2003). Sex-selective abortion and other factors have led to abnormally high sex ratios at birth. In South Korea in 1990, the sex ratio at birth was 117 and in 2000 it was 113. This indicates that in South Korea in 1990, 117 males were born for every 100 females born. The effects of these higher sex ratios are indicated by the larger numbers of males compared to females at ages 0–4, 5–9 and 10–14.

Figure 9.3 also shows South Korea's projected population for the year 2050. By 2050 the country of South Korea is projected to have made the transition to a demographically very old country. In the 50 years between 2000 and 2050, the country will have become demographically top-heavy. South Korea's age and sex structure in 2050 will have a ceiling larger in size than its base. By the year 2050, 39 per cent of its population (17.7 million people) will be 60 years of age or older

and 12 per cent of its population (5.4 million people) will be of age 80 and over. The oldest countries in the world today are not as old as South Korea is projected to be in 2050.

Turning next to North Korea (Fig. 9.4), we first note that there is no evidence of higher than normal sex ratios of birth. Our data for the year 2000 for North Korea indeed indicate that the sex ratios for ages 0–4, 5–9 and 10–14 are right at 105, the levels expected in countries with biologically normal sex ratios at birth. Goodkind attributes this anomaly (compared to South Korea) to the timing and extent of political change in North Korea and his argument is convincing. North Korea implemented its socialist programs in 1946, earlier than any other East Asian country; it promoted the agenda as thoroughly as, if not more so than, other countries and now "is among the last in the world to begin dismantling it" (Goodkind 1999: 216). North Korea has been extremely cautious in permitting the development of private enterprise and free markets. Goodkind holds that this has resulted in "a lack of incentives for people to produce, stagnant incomes, and increasing poverty" (1999: 216). The effective implementation of the socialist agenda and a pervasive promotion of a personality cult (Kim Il Song was "The Great Leader" and now his hereditary successor Kim Jong Il is "The Dear Leader") have resulted in a populace following

“authoritarian edicts wherever these edicts may lead ... The world’s strongest cultural undertow favoring sons apparently weakened when it encountered the world’s strongest socialist campaign against gender inequality” (Goodkind 1999: 216). Such a weakening of son preference has not occurred in South Korea.

We may compare the changing age structure of North Korea between 2000 and 2050 by looking at Fig. 9.4. For the most part, North Korea is projected to mirror the population changes noted in South Korea; however there are notable differences. Currently North Korea’s age structure is affected by the higher mortality rate, intensified by the mortality during the economic hardship of the 1990s and its currently higher TFR. In 2000, only 10 per cent of the population was over age 60, (or 2.3 million persons) and 0.7 per cent of the population (or 152,523 people) were over age 80. Projections for 2050 show that those aged 30–35 in 2000 are the largest cohort and by 2050, they will be 80 and older. Therefore, there will be an increase in the aging population, similar to that occurring in South Korea but at a lower rate, with 28 per cent of its population (or 7.3 million people) over age 60 (compared to 39 per cent of the population of South Korea) and 7 per cent of its population (or 1.9 million people) over age 80 (compared to 12 per cent of the population of South Korea).

Figures 9.5–9.7 are sets of stacked population pyramids for Seoul, Pusan and Daegu for the years of 2000 and 2030. In these pairs of stacked pyramids, the 2000 pyramid is shaded. The elderly situation in Seoul (Fig. 9.5) in 2030 is projected to be as pronounced as in South Korea (Fig. 9.3). There will be very small numbers of persons in the youngest age groups and exorbitantly large numbers of persons in the older age groups. The age and sex structure of Seoul in 2030 is projected to nearly resemble an inverted pyramid. In 2030 it is projected that over 29 per cent of Seoul’s population (more than 2.6 million persons) will be age 60 and over and that over five per cent (almost 500 thousand persons) will be age 80 and over. Between 1966 and 2000 Seoul was transformed from a very young population into a demographically mature population. Between 2000 and 2030 Seoul is projected to become a very old and demographically top-heavy population, with very serious issues of aged dependency. Seoul’s very high projected percentages for the year of 2030 of 29 per cent of the population aged 60 and over and five per

cent aged 80 and over may be compared with those of the United States, namely, 25 per cent and seven per cent; and the world, namely 19 per cent and three per cent. By 2030, Seoul will have changed from a very young population to a very old population.

The population projection data for 2030 for Pusan (Fig. 9.6) and for Daegu (Fig. 9.7) indicate that by 2030 both populations are also older than in 2000. Actually, by 2030, Pusan and Daegu will be slightly older than Seoul. By 2030, 34 per cent of Pusan’s population and 31 per cent of Daegu’s population are projected to be of age 60 and over, compared to 29 per cent for Seoul. Like Seoul, both Pusan and Daegu are projected to be demographically very top-heavy by the year 2030.

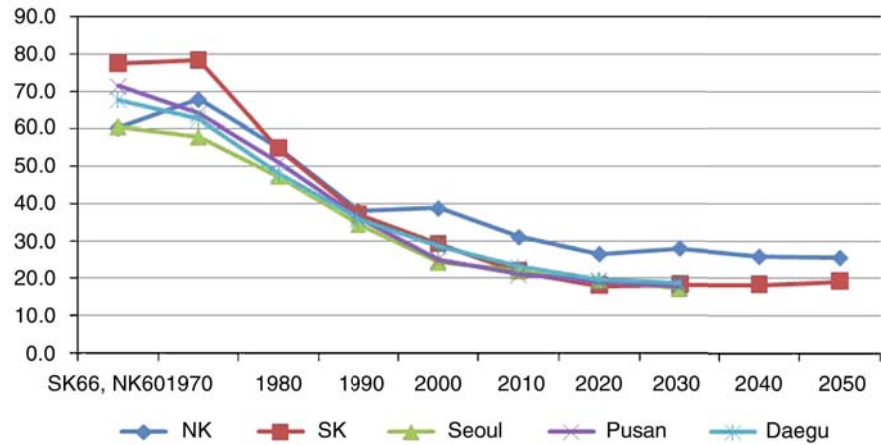
Our examinations of the population pyramids for South Korea, North Korea, Seoul, Pusan and Daegu have painted with broad strokes our consideration of issues of aged dependency. We turn now to more specific examinations.

Aged Dependency

A large number of elderly persons in a population is not problematic if there exists at the same time in the population a large number of producers. It is only when the ratio of elderly to producers becomes high that a host of economic, social and related problems occur. In this section of the chapter we show empirically the current degree of the dependency burden in South Korea, in North Korea and in the three cities of Seoul, Pusan and Daegu and how these burdens will increase in the years ahead.

Total dependency refers to the ratio of persons aged 0–14 plus persons aged 65 and over to persons aged 15–64. The numerator consists in persons who are not typically employed, hence not serving actively as producers of goods, material resources and sustenance. The denominator, persons aged 15–64, contains the age group considered to be productive members of the population. This age group includes many in the labor force who in varying ways, are producing foodstuffs and related goods and services for the population. This ratio is multiplied by 100 and thus indicates the number of dependents in the population per 100 producers. The total dependency ratio (TDR) may be subdivided into a youth dependency ratio (YDR), i.e., persons 0–14

Fig. 9.8 Youth dependency ratios: South Korea, North Korea, Seoul, Pusan and Daegu, 1966 to 2030/2050



Source of Data: United Nations, http://unstats.un.org/unsd/cdb/cdb_advanced_data_extract_fm.asp

divided by persons 15–64; and an aged dependency ratio (ADR), i.e., persons 65+ divided by persons 15–64.

Figure 9.8 presents the youth dependency ratios (YDR) for South Korea and North Korea for 1966 and for every succeeding decennial year through 2050; similar data are presented for Seoul, Pusan and Daegu through 2030. Between 1966 and 2000, the YDRs dropped considerably for the country of South Korea, North Korea and the three cities. In 1966 the YDR for South Korea was 77.3 and for Pusan it was 71.3. Daegu and Seoul had YDRs in 1966 of 67.6 and 60.5, respectively. This means that in South Korea in 1966, for every 100 members of the producing population (persons between the ages of 15 and 64), there were over

77 young dependents (persons between the ages of 0 and 14). By the year 2000 the YDRs of South Korea and its three cities had fallen dramatically to levels between 24 (for Seoul) and 29 (for South Korea).

The YDRs of South Korea and its three cities are not projected to change significantly between 2000 and 2030. The data shown in Fig. 9.8 indicate that these four populations will all have YDRs in the year 2030 of between 17 and 19. This is a situation that would not have been predicted, say back in 1966, when their YDRs were between 60 and 77. Their rapid fertility transitions (discussed and examined earlier) are the major cause of these decreases in youth dependency.

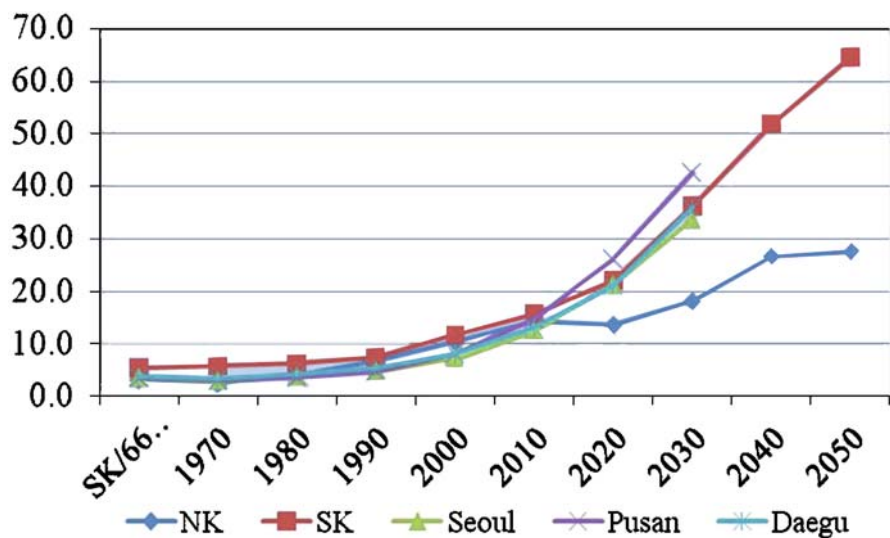


Fig. 9.9 Aged dependency ratios: South Korea, North Korea, Seoul, Pusan and Daegu, 1966 to 2030/2050

Source of Data: United Nations, http://unstats.un.org/unsd/cdb/cdb_advanced_data_extract_fm.asp

Figure 9.9 shows aged dependency ratios for South Korea and for Seoul, Pusan and Daegu. Unlike the situation with respect to the YDR in which these four populations experienced major decreases between 1966 and 2000, there have been modest increases in the ADR. In South Korea the ADR increased from 5/100 in 1966 to 10/100 in 2000. The ADRs for Seoul, Pusan and Daegu were all 4/100 in 1966 and increased to between 7 and 8 by the year 2000. These current ADRs are near the global average. In 1990 the ADR for less developed regions was 8 and was projected to increase to 21 by 2050; the ADR in more developed regions in 1990 was 18 and is expected to increase to 41 by 2050 (Rowland 2003).

To illustrate using different data that reflect the same phenomenon, in 2000 eleven per cent of South Korea's population was over age 60, compared to nine per cent in both Seoul and Daegu and ten per cent in Pusan. By comparison, in 2004, twenty countries, all in Europe except for Japan, had between 15 and 20 per cent of their populations age 65 and above. Italy had the highest percentage (19.2 per cent), followed by Japan (19.0), Greece (18.6), Germany (18.3), Spain (17.6), Sweden (17.3), Belgium (17.3), Bulgaria (17.1), Portugal (16.9), Estonia (16.5) and France (16.4) (Kinsella and Phillips, 2005).

The aged dependency situation changes remarkably when we move ahead 30 years to 2030. South Korea will have become older by 2030, with a heavier aged dependency burden. South Korea's ADR is projected to increase from 10 aged dependents per 100 producers in 2000 to 36 aged dependents per 100 producers in

2030. The levels of the ADR for the three major Korean cities will have increased from 7 to 34 (Seoul), from 8 to 43 (Pusan) and from 8 to 36 (Daegu). However, the ADR for North Korea in 2030 remains at just under 20. North Korea is not projected to have as great a dependency burden as South Korea and its three cities.

By 2030 South Korea and its three cities are expected to have made the transition to becoming demographically very old with heavy age dependency burdens. In the 30 years following 2000, these populations will have become demographically top-heavy. By 2050, the ADR of South Korea is projected to be larger still. For every 100 producers in South Korea in 2050, there are projected to be 63 aged dependents. In contrast, in the U.S. in 2050, there are projected to be 47 aged dependents for every 100 producers.

Another way to consider the relative numbers of aged persons in a population is to calculate a parent-support ratio (PSR), which takes the number of persons 80 years old and over, per 100 persons aged 50–64 (Velkoff and Lawson 1998). The PSR is an indication of the relative burden of the oldest old population, i.e., the elderly parents, on the population aged 50–64, i.e., the children of the elderly parents.

Figure 9.10 presents parent support ratios (PSRs) for 1966 and for the decennial years from 1970 to 2050 for South Korea and North Korea and for the decennial years through 2030 for South Korea's three cities. In 1966 all five populations had low PSRs. They were lowest in South Korea as well as in Seoul, Pusan and Daegu, at between 2 and 3 persons of age 80 and over per 100 persons aged 50–64. In 1966 the elderly par-

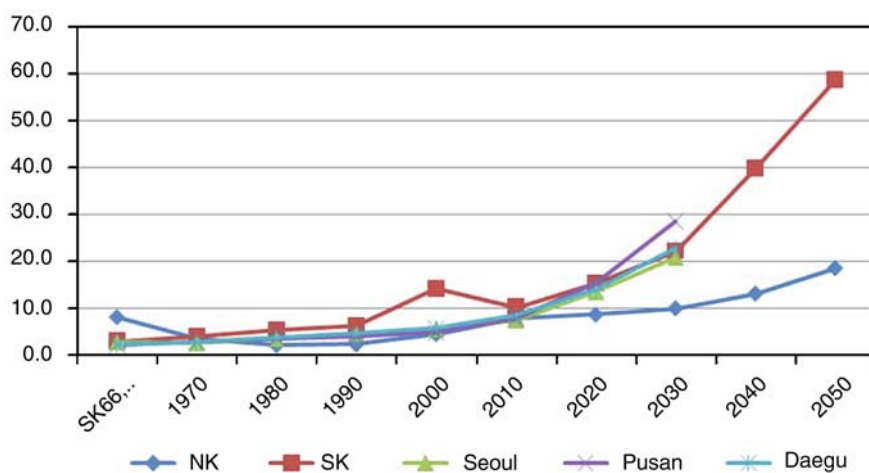


Fig. 9.10 Parent support ratios: South Korea, North Korea, Seoul, Pusan and Daegu, 1966 to 2030/2050

Source: United Nations, http://unstats.un.org/unsd/cdb/cdb_advanced_data_extract_fm.asp

ent burden on their older children in each of these five populations was minimal. By 2000 the parent support ratios had increased to around 12 for South Korea and to levels between 5 and 8 for the other populations. In all five populations, the burden of elderly parents on their children definitely increased but only slightly so.

South Korea and Seoul, Pusan and Daegu are projected to experience even more dramatic increases in the PSR by 2030. The PSR is expected to increase almost three-fold in South Korea from 7.8 in 2000 to 22 in 2030. By 2030, the PSR is projected to be as high as 28.6 in Pusan and 20.8 in Seoul and 22.8 in Daegu. The PSR for North Korea is projected to remain at about 10. The burden of elderly parents on their children will be greatly increased in 2030 in the other four populations.

For instance, in Pusan in 2030, there are projected to be almost 29 persons aged 80+ for every 100 persons aged 50–64. The situation in Pusan in 2030 of elderly children providing and caring for their elderly parents, as well as the situations in South Korea and in Seoul and Daegu, will be dramatically more consequential than they were in the year of 2000. By 2050, the PSR will have increased to the extremely high level of just under 60. The burden of elderly parents in South Korea in 2050 will be 20 times higher than it was in 1966. In the concluding section of this chapter we consider some of the implications of these findings.

Implications

In this chapter we have examined the current and projected levels of the elderly population in North Korea and South Korea and in South Korea's three big cities. By the mid-point of the twenty-first century, South Korea is projected to be one of the oldest countries in Asia and among the oldest countries in the world; it is projected to have one of the heavier old age dependency burdens of any country in the world. The dependency burdens for the cities of Seoul, Pusan and Daegu are also projected to have increased considerably from their low levels in the 1960s. The situation for North Korea is not projected to be as striking. Nevertheless, given these projected levels of the elderly population, there are several social, economic and structural implications that should be addressed. Specifically, will the current pension and health care programs, as

designed, be able to meet the needs of the projected aging populations?

First, we address the funding of health care for the aging population. South Korea currently has full health insurance coverage for all citizens, funded about equally through public social insurance and private employer insurance (Wagstaff 2005). South Korea has made remarkable progress in offering full health insurance since 1963 when a national law passed allowing voluntary health insurance. Subsequent changes led to mandatory requirements for firms to provide medical insurance for employees and their dependents beginning with large firms in 1977; 300 employee firms in 1979 and those with 100 plus employees in 1981. Coverage was extended to smaller firms, civil service employees and teachers in 1979; next was regional coverage for rural residents mandatory in 1988 and for urban residents in 1989. Widespread political support for access to universal health care led to The Unified Health Insurance Act in 1999 (Lee 2003). The health care system has followed the Japanese system of both private employer and government sponsored insurance. The use of private providers, with limited to no oversight also raises issues of whether expensive medical equipment and testing are equitably and efficiently used. Each physician or private provider promotes their own practice without coordination to insure that services are needed or that decisions to use testing or special equipment are equitable among all levels of insured. Thus the use of private medical insurance providers leads to a two tiered system with different services available for the rich and poor (Lee 2003).

Health care expenditures exceed the health insurance income and health care providers complain that only about 65 per cent of customary fees are reimbursable (Lee 2003). These current concerns raise questions of how the system will be able to function with the anticipated ADR increase in the future. Therefore, it continues to be debated whether the current decentralized system of using private providers, with limited oversight is economically feasible.

Second, we address the pension program, also a private pay program recently nationalized to include all. The South Korean pension program has public support following Confucian traditional respect and support for the aged and capitalistic concepts of the use of private enterprise. Consequently, similar to the health insurance program, the formal pension program began in 1953 with a voluntary retirement

program (Bateman 2007). Bateman found that legislation since that time has incrementally increased both the voluntary nature of the pension program and the portion of the workforce covered. In 1961, pension programs became mandatory for firms with over thirty employees. Next coverage was mandated for government employees; in 1960 government workers were covered; in 1963 the military and in 1975 private school teachers. In 1988 the National Pension Scheme (NPS) was initiated, The NPS covered all workers, in places with over ten employees, aged 18–60 (covering about 30 per cent of employees). The next mandate, in 1990, was that firms with over five employees must provide coverage. Coverage included both employee and employer contributions and benefits included retirement, disability and survivor pensions. By 1996, only 37 per cent of the labor force was covered. At the time of the economic crisis in the mid 1990s, the pension coverage was minimal for the aged raising concerns. The various systems were close to deficit funding initiating a series of reforms from 1997–2003 (Bateman, 2007).

The pension reforms over the period 1997–2003 included parametric reforms to the NPS and special public pensions, the introduction of a non-contributory old age pension, improved management of the NPS reserves through the elimination of directed public-sector investments, some funding of retirement allowances, the establishment of a single financial regulator and the consistent taxation of retirement incomes. (Bateman 2007:11,12)

The Federation of Government Employees Union (FGEU) is opposed to governmental plans, labeled as “pay more, receive less”. These plans would increase their contributions by an additional 3 per cent and cutting their benefits in half, while raising the age of receiving benefits from age 60, at the rate of 1 year every two years starting in 2023 to age 65 in 2031 (Hae-in 2007). The pension program’s projected deficit will be 18.1 trillion won by 2030 (Hae-in 2007). This translates into \$19.8 billion dollars, while substantial, however with a 2005 GDP of 787.6 billion is 2.5 per cent of the GDP (U.N. 2007).

Given the current political situation there is also the possibility that the two Koreas will unify within the next 50 years. Corson and Minghi (1993) address the possibility of reunification by comparing the experiences of Vietnam and Germany. They suggest that the two Koreas will likely follow the pattern of reunification of Germany, a peaceful reunification through elec-

tions versus a military takeover. The economic reality is that South Korea has a strong democratic industrial nation and would thus be the “winner”. However, as winner there is the financial obligation of supporting the infrastructure of the weaker, less industrialized nation state. The infrastructure of medical and health care services in the rural north are unknown but are not likely to equal those in South Korea. The culture would support offering the same health insurance and pension to the country, requiring overhauling both systems. The largest employer in the north is the military and government. If the pattern in Germany follows this would leave a large segment of the population unemployed, creating additional strains on public pension and health insurance plans that are currently privatized, based on employee or employer funding.

Third, we address whether the smaller family generated by lower TFRs will be able to provide intergenerational support for the elderly. DeVos and Lee (1993) note that family support of elders is the socially accepted norm in South Korea, in spite of increasing urban living and moves from rural agrarian society to an urban industrialized society. Traditionally in Korea, the support of one’s elder parents has been the responsibility of the sons. The parents usually lived with the oldest son and either with or nearby the other sons (De Vos and Lee,1993; Watari and Gatz 2004) The eldest son and his male siblings tended to be responsible for providing the parents with economic support. The sons would rely on one of their sisters, or sometimes on their wives, i.e., their parents’ daughters-in-law, to provide the parents with emotional support. These norms have been adjusted or modified in past decades, especially in South Korea since the 1960s when the proportion of aged living in family households changed dramatically with urbanization. De Vos and Lee (1993) note that in the years from 1970 to 1980, urbanization increased so that over 57 per cent were urban dwellers and 10 per cent fewer aged lived in intergenerational households.

This change is particularly noticeable among urban residents such as those in Seoul, Pusan and Daegu, the three urban area included in this analysis as they typify the urban population of South Korea. Nevertheless, the provision of economic and emotional support to one’s parents has seldom been a major burden. As one might expect in a population with modestly high levels of fertility, there have usually been many more producers in the population than aged dependents.

However, given the very low levels of fertility in contemporary South and North Korea, as well as the highly unbalanced sex ratio at birth in South Korea, the provision of eldercare will surely be a concern in the years of the twenty-first century, especially in South Korea and its three big cities. For one thing, as we have already noted, in coming decades the two Koreas and the three cities will have many more aged dependents per producers than they have presently. South Korea in particular will have an extremely high aged dependency burden in 2050, likely among the highest of any country in Asia.

In the case of South Korea, when we couple this very high ADR for the year 2050 with its abnormally high sex ratios at birth (SRBs), the issue of eldercare provision in the future becomes even more complex. Although these abnormally high SRBs have begun to fall off in recent years, there nonetheless have already been born in South Korea a large number of males who will find it difficult, if not impossible, to find females to marry. We have estimated that there have already been born in South Korea over one million boys who when they reach marriage age will not be able to find South Korean women to marry.

There could well be a situation in South and North Korea in the next three or so decades with many more aged dependents per producers and, moreover in South Korea a situation with as many as one million male producers without wives. As the TFR is below replacement level, indicating the absence of siblings, along with son preference and the anticipated bride shortage, some of these single males will have the responsibility for providing both the economic and the emotional support for their parents. What might be the social and mental health implications of such a situation? Anthropological research conducted in rural Ireland provides a possible answer.

In rural Ireland, Scheper-Hughes (1979) has noted that the last-born male has the responsibility for remaining with his parents, taking over the responsibility of the family farm and caring for the elderly parents. His older male siblings typically move to the cities, immigrate abroad, or enter the priesthood. His female siblings move away when they marry. The last-born male, sometimes referred to as the “scraping of the pot” (Scheper-Hughes 1979: 163) and often called the “boy-o,” is pre-ordained by his sex and birth order to remain unmarried, to care for the

family plot and to support his parents. This is an economic strategy in the society involving the selection of a male heir, one which is not that uncommon in other societies.

The situation in rural Ireland, however, also involves a related psychological strategy in which the rural families “create a scapegoat, a vulnerable member” (Scheper-Hughes 1979: 165) who is the last-born male; he knows from his earliest years that he will never marry and will forever live at home with his parents until their death. Males finding themselves in the social position of ‘boy-o,’ are more likely than their older sibs, male or female, to become alcoholics and/or to suffer from mental disease, especially schizophrenia.

According to Scheper-Hughes, “the dynamics of rural Irish socialization ... is weighted in favor of the mental health of daughters and earlier-born sons, and against the healthy ego integration of later-born sons in large and traditional farm families” (1979: 166). These last-born males never grow up; they “get stuck by default with the land and (are) saddled with a life of almost certain celibacy and self-negating service to the old people” (Scheper-Hughes 1979: 179). The last-born son is “forever a ‘boy-o,’ and never a man” (Scheper-Hughes 1979: 185).

In South Korea in coming decades, there will be a very large number of unmarried sons who, according to Confucian tradition mentioned earlier, have the cultural expectation to care both economically and emotionally for their aged parents. We project with the lower TFR and the imbalanced sex ratio at birth, that as many as one son in twelve will be in this position. If the situation in rural Ireland is at all relevant for South Korea, one would expect to find higher levels of mental illness among these Korean “boy-o’s” than among the sons whose wives are assisting them in the care of their elder parents.

Unlike the case these days in South Korea and in North Korea, where there are often several married sons, along with their sisters, available to care for the elderly parents, the situation in the two countries and in the three cities of Seoul, Pusan and Daegu, in the next forty to fifty years is projected to be quite different. There will be many more elderly – parents and aunts and uncles – requiring care, than there are today. Moreover, in South Korea and in its three cities, many of the providers will be sons, perhaps only-born sons, without wives. Alcoholism and mental

illness, especially schizophrenia, could well become more prevalent among these bachelor sons than they are today.

Marriage migration may be a solution. One possibility is the immigration to South Korea of Korean women from the northeastern part of China where more than two million Chinese of Korean ancestry reside (Suh and Shultz 1990; Park and Han 1990). Another possibility would be the migration from North Korea of Korean women of marriage-age. Both strategies would of course enlarge the pool of wives in South Korea but would cause marriage-market imbalances in the areas of origin. To date, however, there is little or no evidence of such marriage migration to South Korea from North Korea or from the Korean areas of northeastern China. However, there is some of this kind of marriage migration underway in China (Davin 1998; Fan and Huang 1998). There are still other implications but we will only briefly mention one. The projections of the elderly population of the world and the two Koreas that have been set forth above may well be underestimating the levels of human longevity that will actually be experienced. Biodemographic research conducted by Vaupel and his associates (Vaupel et al. 1998; see also Kannisto et al. 1994) suggests that rates of mortality need not necessarily accelerate with age. Their studies of the genetic and nongenetic causes of survival indicate that it is not unlikely that future generations could live even longer lives than those assumed in the population projections used in this chapter. If the research of Vaupel and his associates is correct, there will be even more elderly in the world and in the two Koreas, by the mid-point of the twenty-first century and later, than indicated earlier in our projections (Table 9.1).

In this chapter we have traced South Korea's and North Korea's fertility transitions, as well as those of South Korea's three big cities, from high levels in the 1960s to low levels today. We have shown that these dramatic reductions, in but a few decades, to below replacement fertility have produced and will continue to produce, unprecedented growth in the old proportion in their populations. In the next several decades of this new century, there will be very heavy aged dependency burdens on the producing populations of South Korea and its three cities and slightly less of a burden in North Korea. The burdens will become even heavier in later decades. Policy leaders in South Korea have only recently become cognizant of the current numbers

of elderly and especially the future numbers of elderly. We have no evidence that North Korean leaders are as aware. In any event, it is our opinion that these issues and their implications require even more attention than they have received.

References

- Bateman H (2007) South Korea—Pension reform and the development of pension systems: An evaluation of World Bank assistance. Working Paper Retrieved on 9/23/07. Available online at http://www-wds.worldbank.org/servlet/WDSContentServer/IW3P/IB/2007/03/21/000020439_20070321155126/Rendered/INDEX/391600KR1pensions01PUBLIC1.txt
- Chang Y (1966) Population in early modernization. Unpublished Ph.D. Dissertation, Princeton University, Korea
- Cho L-J, Arnold F, Kwon TH (1982) The determinants of fertility in the Republic of Korea. National Academy Press, Washington, DC
- Corson MW, Minghi JV (1994) Reunification of partitioned nation-states: Theory versus reality in Vietnam and Germany. *J Geogr.* 93:125–131
- Davin D (1998) Internal migration in contemporary China. MacMillan Press, Basingstoke, England
- De Vos S, Lee Y-J (1993) Change in extended family living among elderly people in South Korea, 1970–1980. *Econ Dev Cult Change* 41:377–393
- Fan CC, Huang Y (1998) Waves of rural brides: Female marriage migration in China. *Ann Assoc Am Geogr* 88:227–251
- Frisbie WP (1986) Trends in ethnic relations: Hispanics and Anglos. Texas Population Research Center papers, series 8. Population Research Center, The University of Texas, Austin
- Goodkind D (1999) Do parents prefer sons in South Korea? *Stud Fam Plann* 30:212–218
- Hae-in S (2007) Government, employees discuss pension reform. *The Korea Herald*, January 26 2007. from <http://www.globalaging.org/pension/world/2007/southkorea.htm>. Retrieved on 9/23/07
- Hull TH (1990) Recent trends in sex ratios at birth in China. *Popul Dev Rev* 16:63–83
- Kannisto V, Lauritsen J, Thatcher AR, Vaupel JW (1994) Reductions in mortality at advanced ages: Several decades of evidence from 27 countries. *Popul Dev Rev* 20:793–810
- Kinsella K, Phillips DR (2005) Global aging: The challenge of success. *Popul Bulletin* 60(1)
- Kim D-S (1997) The pattern of changing trends and the regional difference in the sex ratio at birth: Evidence from Korea and Jilin Province, China. *Korea J Popul Dev* 26:19–42
- Kim D-S (2002) Missing girls in South Korea: Trends, levels and regional variations. *Population (English ed.)* 59:865–878
- Kim Y (1966) The population of Korea. Unpublished Ph.D. Dissertation, Australian National University
- Korea National Statistical Office (1995) 1994 Korean statistical yearbook. National Statistical Office, Seoul

- Korea National Statistics Office (2007) Available online at <http://www.nso.go.kr/eng2006/emain/index.html>. Retrieved on 9/20/07
- Lee J-C (2003) Health care reform in South Korea: Success or failure? *Am J Pub Health* 93:48–51
- Lee HY (1979) Demographic transition in Korea prior to 1960. In: Cho L-J, Kobayashi K (eds) *Fertility transition of the East Asian populations*. The University Press of Hawaii, Honolulu
- Nahm AC (1988) *Korea, tradition and transformation: A history of the Korean people*. Hollym Corporation, Elizabeth, New Jersey and Seoul, Korea
- Park CB, Cho NH (1995) Consequences of son preference in a low-fertility society: Imbalance of the sex ratio at birth in Korea. *Popul Dev Rev* 21:59–84
- Park CB, Han J-Q (1990) A minority group and China's one-child policy: The case of the Koreans. *Stud Fam Plann* 21:161–170
- Population Reference Bureau (1999) *World population data sheet, 1999*. Population Reference Bureau, Washington, DC
- Poston Jr DL, Gu B, Liu PP, McDaniel T (1997) Son preference and the sex ratio at birth in China. *Soc Biol* 44:55–76
- Poston Jr DL, Kim HG (1992) Women's status and fertility in the Republic of Korea. Final Report of Research Grant No. RD 87056 submitted to the Rockefeller Foundation, New York City, New York. 112 pp. College Station, Department of Sociology, Texas A&M University, Texas
- Poston Jr DL, Kim HG, Wu JJ (2000) Patterns and variation in the sex ratio at birth in the Republic of Korea. Paper presented at the annual meeting of the Southern Demographic Association, New Orleans, October
- Poston Jr DL, Wu JJ, Kim HG (2003) Patterns and variation in the sex ratio at birth in the Republic of Korea. *Dev Soc* 32:47–60
- Rowland DT (2003) *Demographic methods and concepts*. Oxford University Press, New York
- Scheper-Hughes N (1979) *Saints, scholars, and schizophrenics: Mental illness in rural Ireland*. University of California Press, Berkeley
- Suh D-S, Shultz EJ (eds) (1990) *Koreans in China*. University of Hawaii Press, Honolulu
- United Nations (1983) *Indirect techniques for demographic estimation, manual X*. New York, United Nations
- United Nations (2007) *UN statistics advanced data extract*. Available online at http://unstats.un.org/unsd/cdb/cdb_advanced_data_extract_yr.asp?HSrID=19450&HCrID=410. Retrieved on 8/20/07
- U.S. Bureau of the Census (1999) *World Population Profile: 1998, Report WP/98*. Government Printing Office, Washington, DC, U.S.
- U.S. Bureau of the Census (2000) *Census bureau international data base* Available at <http://www.census.gov/cgi-bin/ipc/idbagg>. Updated 5/10/2000 and 8/30/2007
- U.S. Bureau of the Census (2007) *Census bureau international data base*. Available online at <http://www.census.gov/cgi-bin/ipc/idbagg>. Retrieved on 8/30/2007
- Vaupel JW, Carey JR, Christensen K, Johnson TE, Yashin AI, Holm NV, Iachine IA, Kannisto V, Khazaeli AA, Liedo P, Longo VD, Zeng Y, Manton KG, Curtsinger JW (1998) Biodemographic trajectories of longevity. *Science* 280:855–860
- Velkoff VA, Lawson VA (1998) Gender and aging caregiving. *International Brief, IB/98-3* (December). Bureau of the Census, Washington, DC, U.S.
- Wagstaff A (2005) Health systems in East Asia: What can developing countries learn from Japan and the Asian Tigers? World bank policy research working paper 3790. Available online at http://econ.worldbank.org/external/default/main?pagePK=64165259&theSitePK=469372&piPK=64165421&menuPK=64166093&entityID=000016406_20051207105757. Retrieved 9/1/07
- Watari KF, Gatz M (2004) Pathways to care for Alzheimer's Disease among Korean Americans. *Cultural Diversity and Ethnic Minority Psychology* 10:23–38

Chapter 10

Population Aging in Canada and the United States

Tracey A. LaPierre and Mary Elizabeth Hughes

Introduction

Population aging is a global phenomenon. The populations of developed nations have aged quickly over the last fifty years, shifting from a median age of 29.0 in 1950 to a median age of 38.6 in 2005 (United Nations 2007). Although the populations of developing nations are younger, with a median age of 25.5, these populations are expected to age rapidly in the future (United Nations 2007). As described in Chapter 1 of this handbook, the aging of the human population is principally the result of worldwide fertility decline, although reductions in old age mortality also play a role. This set of changes is part of the demographic transition, the process by which societies move from high fertility and mortality to low fertility and mortality (Kirk 1996). In turn, these demographic changes are intertwined with social and economic change such that the demographic transition is typically considered a component of modernization.

Although the broad outlines of the demographic transition and consequent population aging are similar across nations, countries differ in their timing, pace and degree. These differences in turn reflect underlying variation in social, political and economic contexts and have varying consequences for these contexts across countries. The U.S. and Canada form an interesting pair in this regard. These two nations are both relatively young and share, among other characteristics, a long,

undefended border, a history of European settlement, a tradition of cross-border migration, democratic forms of government, relatively integrated consumer markets, large post-World War II baby booms and recent large increases in immigration from Asia and Latin America. As post-transition societies, both of their populations have aged rapidly in the twentieth century. However, despite these similarities, the U.S. and Canada also differ in fundamental ways. For example, the population of Canada is one-tenth the size of the population of the U.S. and, although both populations contain members of ethnic minority groups, these minorities are a much larger proportion of the U.S. population than the Canadian population. Another important distinction is that Canada provides National Health Insurance for its citizens, in contrast to the market-based approach used in the U.S. As a result of these and other differences, the pattern of population aging has differed somewhat between the two nations. Even more important, the issues raised by population aging and the potential solutions to these issues, while broadly similar, reflect the circumstances of each nation. Comparing and contrasting population aging in these two nations demonstrates the contingencies of population aging by highlighting the differences between two nations with many similarities.

There is much discussion in both Canada and the U.S., as in other developed countries, of a population aging crisis. In Canada and the U.S. this crisis is mainly attributed to the aging of the large cohorts born during the baby booms. Dire consequences are predicted in both countries if drastic measures are not taken to contain the social and economic costs of population aging. In this chapter, we evaluate population aging in the U.S. and Canada in light of this rhetoric about a population aging crisis. We begin by placing each nation's recent experience of population aging in the context of its long-term

T.A. LaPierre (✉)
Department of Sociology and the Gerontology Center
University of Kansas
1000 Sunnyside Ave., Room 3090
Lawrence, KS 66045-7555, USA
E-mail: tlapie@ku.edu

population history. Next, we describe the characteristics of current and future elderly in each country, emphasizing the ways in which cohort replacement will alter the profile of the older population over time. We then discuss a set of economic, social and political issues that arise from population aging, highlighting the ways in which they are playing out differently in the two nations and their implications for the future. Finally, we discuss why population aging is viewed as a crisis in Canada and the U.S. and assess the evidence supporting this perception.

A Long View of Population Aging in the United States and Canada

In the last ten to twenty years, population aging has become a key issue in both Canada and the U.S. and research on population aging has grown rapidly. As a result, policy makers increasingly focus on managing the potential consequences of an older population, and products and services geared towards the aged are growth industries. In both nations, this interest was spurred by recent demographic changes, including declines in fertility and, especially, the aging of the large baby boom cohorts. The seeming suddenness of population aging has contributed to a sense of crisis in both nations. Implicit in this “aging crisis” perspective is the idea that population aging is a relatively short-term issue that will disappear with the demise of the baby boom cohorts.

However, population aging is not a new phenomenon in either country (Munnell 2004). In fact, both populations have been growing older from the time the nations were established as independent states. Population aging in the U.S. and Canada is also not a transient phenomenon. Under all *probable* scenarios of demographic change, the U.S. and Canadian populations are projected to grow older over the next fifty years, although the pace of aging will slow toward the end of the period (Statistics Canada 2005; United States Census Bureau 2000a, 2004b).

The long-term aging of the Canadian and U.S. populations reflects equally long-term shifts in demographic behavior. Changes in the age structure of a population can occur only through alterations in the fundamental demographic processes of fertility, mortality and migration, which in turn change the relative

size of age groups within the population (Preston et al. 1989). As in the rest of the industrialized world, population aging in the U.S. and Canada is the result of the demographic transition, the shift from high rates of fertility and mortality to low rates. In the U.S. and Canada, this demographic shift has gone hand in hand with their development from fledgling nations with agrarian economies to major powers with post-industrial economies and largely urban populations. This development included profound transformations in technology, economic opportunity, the nature of work, the value of children, relationships within the family and the structure of social institutions. Many of these changes literally affected people’s life chances in that they diminished the risk of sudden death. At the same time, they altered the context in which people made seemingly private decisions about the number of children to have and where to live.

Although the population histories of the U.S. and Canada have much in common with other developed nations, they also have characteristic features, including an initial abundance of land, long traditions of international migration, large twentieth century fertility swings and increasingly multi-ethnic populations. These features have played out somewhat differently in the two nations but they set the Canadian and American populations apart to some extent from their counterparts in the developed world. The legacy of these processes will continue to influence each nation’s age structure as well as their responses to population aging.

The Long View in the United States

When the U.S. declared its independence in 1776, its population reflected the nation’s origins in European colonization. The territories now encompassed by the U.S. were occupied for centuries by varied and widely dispersed indigenous peoples (Thornton 2000). However the nation’s beginnings are typically traced to the European exploration and settlement of these territories beginning in the sixteenth century. The Spanish founded the first permanent European settlement north of Mexico at St. Augustine, Florida in 1565; fifty years later, the British, Dutch and Swedish began forming colonies along the eastern seaboard of the continent that were eventually consolidated under British rule.

The French claimed a vast territory stretching from the Great Lakes southward through the Mississippi valley, which was for the most part unsettled.

The long period of colonization and the different national origins, varied purposes (e.g., plantation agriculture, trading center, religious freedom) and diverse geographic locations of the settlements meant that the colonial period consisted in multiple demographic regimes (Gemery 2000; Thornton 2000; Walsh 2000). Moreover, a substantial fraction of immigrants to the colonies consisted of forced migrants, victims of the transatlantic African slave trade. The demographic behavior of the enslaved African population likely differed from that of neighboring European populations, due to different cultural origins and the grim realities of slave life. Finally, demographic behavior among the heterogeneous indigenous populations was shaped by both traditional practices and by the diseases, war and displacement brought by the Europeans.

Population data from the colonial period is derived from sources such as militia lists, tax rolls, ship passenger lists and local vital event records and is thus available only for certain populations at particular times, nearly all of which are European (Gemery 2000; Walsh 2000). This research has been synthesized by Gemery (2000), providing a broad view of the European colonial population. Fertility was higher than in the European nations who sponsored the colonies and high in an absolute sense as well; estimated total fertility rates for colonial settlements range from 6 to 8, with some as high as 9 births per woman. These high fertility rates were largely due to early and nearly universal marriage for women, in part because of the high sex ratio (number of men per hundred women) in the colonies. Research on colonial mortality suggests that death rates in the northern colonies were low by the standards of the time, with estimated life expectancies ranging from 36 to 55, likely due to a varied and plentiful diet. However, the southern regions experienced significantly higher mortality due to the presence of tropical diseases; so-called “seasoning mortality” was especially high among new arrivals. Not surprisingly, immigration to the colonies was high and movement over what would become provincial, state and national borders was also common.

These patterns are reflected in the characteristics of the American population as documented in the first

U.S. census in 1790, displayed in Table 10.1. From its beginnings as a handful of settlements with populations in the hundreds, the U.S. population had grown to 4 million persons, due both to high rates of natural increase (births minus deaths) and high rates of immigration. In 1800, the first year for which such data are available, the mean age of the population was 16 and half of the population was under age 15. This young age structure is characteristic of high fertility, high mortality populations, which is similar to that found in many developing nations today. Although data on the ratio of men to women became available only in 1820, the high sex ratio reflected the youth of the population. Nearly 20 per cent of the population was African American, almost all of whom were enslaved.

The demographic transition in the U.S. is unusual in that it was initiated by fertility decline (Haines 2000). In the classic version of the demographic transition, mortality decline precedes fertility decline. As shown in Fig. 10.1, which displays U.S. total fertility rates at ten-year intervals from 1800 to 2000, the U.S. fertility decline began in the early nineteenth century, which was decades before any significant declines in mortality. The U.S. fertility decline also began while the U.S. was principally a rural, agricultural society. As a result, fertility decline in the U.S. predated that of any European nation except France. The figure highlights several other important features of the long-term decline in U.S. fertility. First, although U.S. fertility was declining throughout the nineteenth century, it was declining from a high level and thus remained absolutely high – well above replacement level and sufficient for rapid population growth (Haines 2000). The decline in fertility continued in the early twentieth century and in 1930 the U.S. total fertility rate (TFR) was 2.5. After further declines during the Great Depression and World War II, American fertility rebounded in the late 1940s, eventually reaching levels not experienced since the very early twentieth century. This rebound, the baby boom, lasted nearly twenty years. However a second feature visible in Fig. 10.1 is the anomalous nature of the baby boom when seen in long-term perspective. Lower fertility levels after the baby boom were far from a “baby bust”; rather they were a return to the long-term trend. Finally, Figure 10.1 shows that at the turn of the twenty-first century, fertility hovers just below replacement at about 2 children per woman. This level is higher than that observed

Table 10.1 Selected characteristics of the United States population, census years 1790–2000

Census year	Size (1000s)	Per cent change	Median age	Per cent under age 15	Per cent age 65 and over	Sex ratio	Per cent foreign born	Per cent			Per cent hispanic origin ^a
								White	Black	Other race	
1790	3,929	–	na	na	na	na	na	80.7	19.3	na	na
1800	5,308	35	16 ^b	50.1	na	na	na	81.1	18.9	na	na
1810	7,240	36	16 ^b	50.1	na	na	na	81.0	19.0	na	na
1820	9,638	33	16.7	48.9	na	103	na	81.6	18.4	na	na
1830	12,866	34	17.2	45.0	4.0	103	na	81.9	18.1	na	na
1840	17,069	33	17.8	43.2	3.9	104	na	83.2	16.8	na	na
1850	23,192	36	18.9	41.5	4.2 ^d	104	9.7 ^c	84.3	15.7	na	na
1860	31,443	36	19.4	40.4	4.5 ^d	105	13.1 ^c	85.6	14.1	.3	na
1870	39,818	27	20.2	39.2	3.0	102	14.4	87.1	12.7	.2	na
1880	50,189	26	20.9	38.1	3.4	104	13.3	86.5	13.1	.4	na
1890	62,980	26	22.0	35.5	3.8	105	14.7	87.5	11.9	.6	na
1900	76,212	21	22.9	34.4	4.1	104	13.6	87.9	11.6	.5	na
1910	92,228	21	24.1	32.1	4.3	106	14.7	88.9	10.7	.4	na
1920	106,022	15	25.3	31.9	4.7	104	13.2	89.7	9.9	.4	na
1930	123,203	16	26.4	30.4	5.4	103	11.6	89.8	9.7	.5	na
1940	132,165	7	29.0	24.0	6.8	101	8.8	89.8	9.8	.4	na
1950	151,326	15	30.2	26.9	8.1	99	6.9	89.3	9.9	.8	na
1960	179,323	19	29.5	31.1	9.2	97	5.4	88.6	10.5	.9	na
1970	203,302	13	28.1	28.4	9.9	95	4.8	87.6	11.1	1.3	na
1980	226,542	11	30.0	22.6	11.3	95	6.2	85.9	11.8	2.3	6.4
1990	248,748	10	32.8	21.7	12.6	95	7.9	83.9	12.3	3.8	9.0
2000	281,425	13	35.3	21.4	12.4	96	11.1	81.1	12.7	6.2 ^e	12.5

na, Not Available.

^a Persons of hispanic origin may be of any race.

^b Whites only.

^c Nativity of the slave population was not ascertained; figures assume all slaves were native-born.

^d 60 years and over.

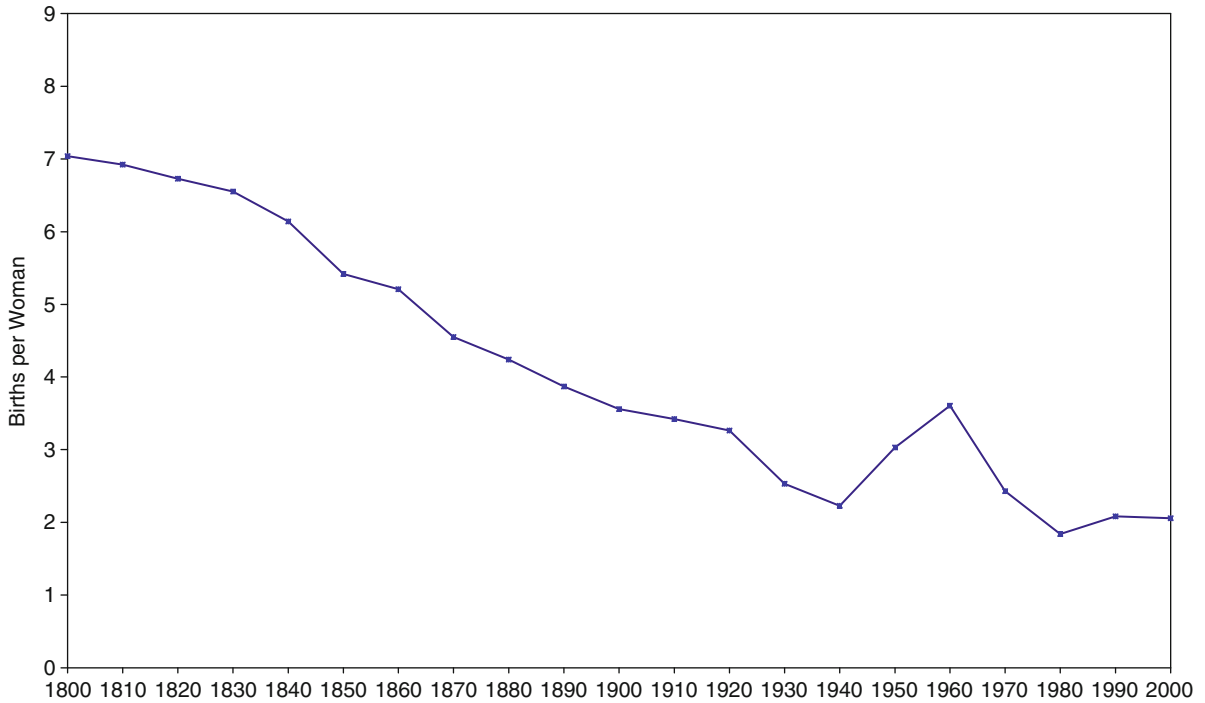
^e Includes multi-racial persons.

Sources: United States Bureau of the Census 1872a: Table IV; 1872b: Table XXII; 1950: Table 17; 1970: Table 21; 1973: Tables 51 and 53; 1975: Series A 143–157 and 119–134; 1988: Tables 17 and 18; 2000b: Table 10; 2002: Table 41; 2005: Table 2-1; 2007: Tables 1, 11 and 14.

in most developed nations (Statistics Canada 2005). Thus the U.S. remains a relatively high fertility society compared to other developed nations.

Compared to the decline in fertility, the U.S. decline in mortality is of relatively recent origin. U.S. death rates were high in the nineteenth century and some evidence suggests that mortality actually rose in the first half of the century (Haines 2000). Haines (1998) estimated that in 1860, life expectancy for whites was

44 years and the white infant mortality rate 181 per thousand; comparable figures for 1890 were 47 years and 151 per thousand. Mortality appears to have begun its sustained decline only around the turn of the century. As shown in Fig. 10.2 which plots life expectancy at birth for men and women from 1900 to 2001, survival improved steadily through the twentieth century (Haines 2000). As in other nations, the initial stage of mortality decline was due to a reduction in the inci-



Note: Total fertility rate is the average number of children born per given current birth rates.
 Sources: Coale and Zelnick 1963; Heuser 1976; National Center for Health Statistics 2008.

Fig. 10.1 Total fertility rate, United States 1800–2000

dence of infectious disease. This reduction was due in large measure to public health efforts that built on the germ theory of disease and sought to prevent the transmission of infectious disease through measures such

as clean water and uncontaminated milk. These efforts reduced episodes of crisis mortality and had a particularly strong impact on the survival of infants and children. As the century progressed, medical interventions

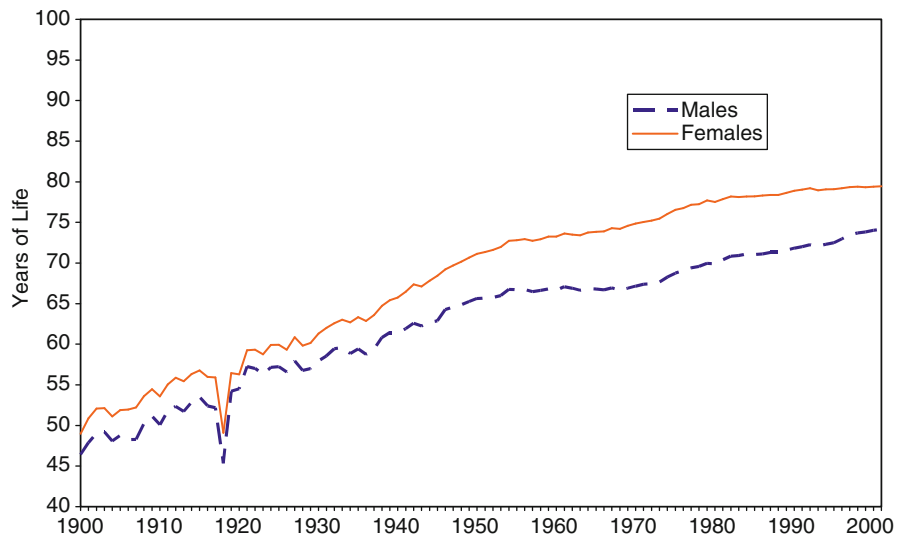


Fig. 10.2 Life expectancy at birth, United States 1900–2001

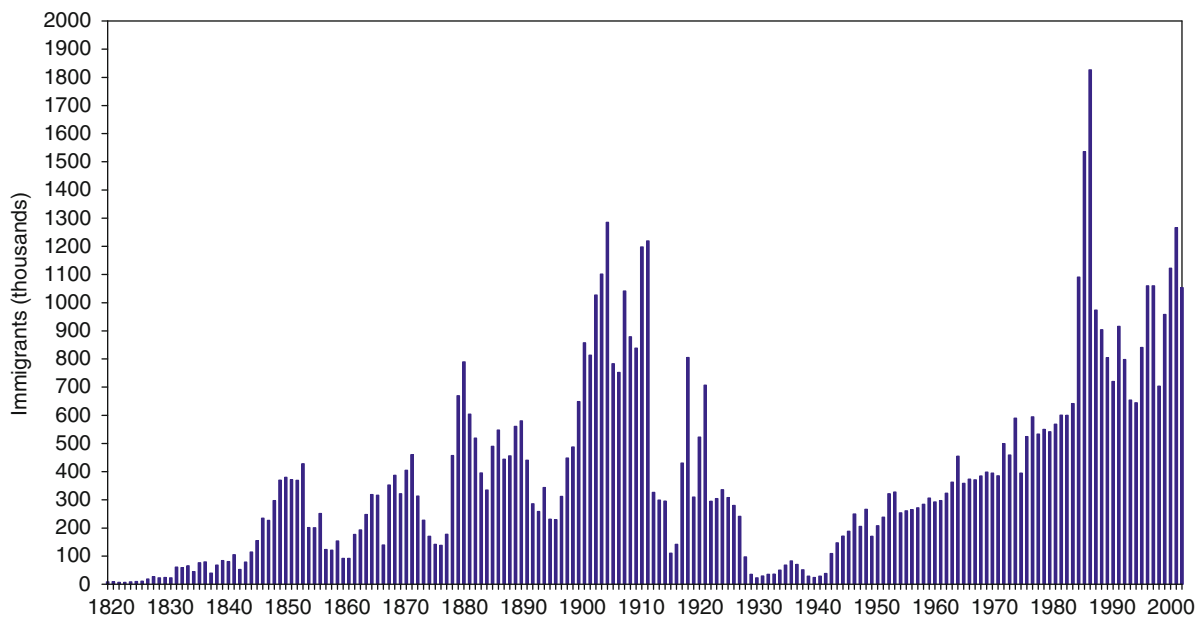
Source: Bell and Miller 2005.

and therapies played more of a role in improving survival probabilities, so much of the improvement in life expectancy reflected declines in adult mortality rates during this time. At the beginning of the twenty-first century, increases in life expectancy are due to declines in death rates in old age. In 2001, life expectancy was 74 years for men and 78 years for women.

Unlike most of today's developed nations but consistent with its colonial past, the U.S. experienced very high rates of immigration during its demographic transition. Figure 10.3 shows the number of immigrants admitted to the U.S. as permanent residents each year between 1820 and 2007. Note that the size of the U.S. population was increasing over this period, so the dramatic increase in the absolute number of immigrants does not reflect equally dramatic increases in immigration rates. Nevertheless, immigration has been an important source of population change over the course of U.S. history. In contrast to fertility and mortality, which show sustained long-term declines (with the exception of the baby boom), immigration waxed and waned, reflecting relative opportunities in sending countries and the U.S. (Haines 2000). Thus, the Irish potato famine and European political unrest led to the well-known increases in immigration from Ireland and Germany in the mid-nineteenth century. The sharp drop in immigration in the 1920s reflects the adoption of a stringent quota system that limited

immigration from many countries, while the resurgence of immigration in the 1970s reflects the abandonment of the quota system for rules favoring family reunification and employment qualifications. Not only did levels of immigration vary over the course of U.S. history but also the origins of immigrants varied. After the slave trade was outlawed in the first decade of the nineteenth century, the immigration stream no longer included large numbers of forced immigrants from Africa. Thereafter, the composition of immigration shifted in response to the same factors as levels of immigration – relative opportunities in the U.S. and the regulatory environment. For example, in the early and middle nineteenth century, the principal sources of immigrants were the nations of Northwest Europe, first Britain and later Ireland and Germany. At the end of the century, the nations of Eastern and Southern Europe sent large numbers of immigrants to the U.S. In the 1970s, the immigration stream changed dramatically as European migrants were replaced by migrants from Central and South America and many parts of Asia (Martin and Midgley 2003).

The impact of these historical population processes on the characteristics of the U.S. population can be traced in the data from successive censuses displayed in Table 10.1 The U.S. population has grown dramatically, especially in the nineteenth century when



Source: Department of Homeland Security 2007.

Fig. 10.3 Number of immigrants, United States 1820–2007

growth rates averaged 2.5 per cent a year and reached 3 per cent in some decades (Haines 2000). These growth rates were unknown in Europe at the time and have only been replicated in the recent demographic experience of some developing nations. In the twentieth century, population growth moderated as fertility declined. In all decades, the majority of population growth was due to natural increase but the fraction attributable to migration varied. Over the entire nineteenth century about 25 per cent of U.S. population growth was attributable to immigration, whereas in the twentieth century the role of immigration has varied, from accounting for 32 per cent of population growth between 1900 and 1910 to -3 per cent between 1930 and 1940, to 40 per cent between 1970 and 1980 (Haines 2000). The key but variable role of immigration in population change is also shown in Table 10.1 by changes in the percentage foreign born from census to census.

Table 10.1 also shows that the mean age of the U.S. population has increased steadily since 1820, with commensurate increases in the proportion of the population aged 65 and over. Despite perceptions about the aging “crisis”, the aging of the U.S. population has accelerated only a little over time. Between 1800 and 1890, the median age of the U.S. population increased 6 years, or 38 per cent; between 1900 and 1990 the median age increased 9.9 years, or 43 per cent. The increases were due to declines in fertility in the nineteenth century and to declining mortality in the twentieth (Preston et al. 1989). The impact of immigration on the age structure of the U.S. population has been mixed, as the effect of immigration on the age structure of a population is not clear a priori. The immediate effect of immigration depends on the ages of migrants but in the longer-term migrants age along with the population and particularly large influxes of immigrants may lead to population aging as these larger cohorts age (Preston et al. 1989). Thus, if not sustained, immigration can eventually accelerate population aging. Differences between immigrant and native fertility and mortality may also shape the impact of immigration on the age structure of a population.

A final feature evident in Table 10.1 is the long history of race/ethnic heterogeneity in the U.S. At independence, the race/ethnic composition of the U.S. reflected the institution of slavery: 20 per cent of the population was African American. This percentage dropped over time as the transatlantic slave trade was abolished and

European immigrants continued to pour into the nation. Although Americans of European heritage are now grouped together as whites, ethnic differences within the European-origin population were once quite salient. The impact of recent immigration from Asia and Central and South America can be seen in the increasing proportions of the population of Asian and Hispanic race/ethnicity. Finally, at all times in U.S. history, race/ethnicity has been cross-cut by nativity, such that demographic differences often appear between native and foreign born persons of similar ethnicity (Easterlin 2000).

The Long View in Canada

Canada also traces its origins to the seventeenth century European colonization of North America. From the beginning, the area that was to become Canada had a strong French presence. Although the French claimed an enormous territory, settlement was concentrated in the St. Lawrence River Valley in what is now Quebec, while the British claimed the settlement of Nova Scotia on the East coast. Reflecting tensions between their founding nations, as well as competition for colonization, the French and British colonies were often in conflict. Eventually, the Laurentian settlements were conquered by Britain and British rule over the entirety of what would become Canada was formalized by the Treaty of Versailles in 1763. One hundred years later, in 1867, the nation of Canada was formed by the confederation of several British colonies (Charbonneau et al. 2000; McInnis 2000a).

The Canadian colonial period thus stretches from the early seventeenth century to the middle of the nineteenth century. The French settlements have been studied extensively, because the colony’s practice of keeping birth, marriage and burial registers along with conducting several censuses provides a wealth of demographic data (Charbonneau et al. 2000); data about the British portion of the colonial population is sparser. As in the other North American colonies, fertility was high in colonial Canada (McInnis 2000a). The Laurentian settlements were especially notable in this regard, achieving some of the highest fertility rates ever recorded, with crude birth rates hovering around 50 per 1000 and often exceeding this level (Charbonneau et al. 2000). Data from the St. Lawrence Valley suggest that mortality was relatively favorable, lower than French

mortality of the time, with a crude death rate of around 30 per thousand. However, the data also show episodic mortality spikes due to epidemics of infectious disease and an apparent increase in infant mortality over time. The original French colonies received very few migrants after their initial settlement, which was concentrated between 1663 and 1673. Fertility was so high that population growth averaged 2.5 per cent a year but the population remained relatively small and this demographic weakness was a factor in the British conquest of French colonial Canada (Charbonneau et al. 2000). After 1761, immigration became an important source of growth for the colonies; in fact immigration was the principal source of population growth from 1761 to 1812 (McInnis 2000a). In this period, most immigrants came from other British North American colonies, including a large influx of loyalists from the

colonies to the south at the time of the U.S. War of Independence. After 1815, immigration from Britain was heavy, although natural increase – on the order of 3 per cent a year, an extremely high level – was the main source of population growth (McInnis 2000a). Few of these immigrants settled in the former French colonies, which thus retained their distinct character.

Table 10.2 shows the characteristics of the Canadian population at the time of the first census after confederation, taken in 1871. The population had grown from an estimated 76,000 in 1761 to slightly under 4 million persons (McInnis 2000a). This figure was 10 per cent of the population of the U.S. in 1870. The 10 per cent ratio of the Canadian and American populations was established very early in the colonial period, due to much sparser settlement in what would become Canada and it persists to this day (McInnis 2000a). The population

Table 10.2 Selected characteristics of the population of Canada, census years 1871–2001

Census year	Size (1000s)	Per cent change	Median age	Per cent under age 15	Per cent age 65 and over	Sex ratio	Per cent foreign born	Per cent		
								White	Aboriginal	Visible minority ^a
1871	3,486	–	na	41.6	3.7	103	16.9	98.5	0.7	0.6
1881	4,325	24	na	38.7	4.1	102	13.9	95.9	2.5	0.6
1891	4,833	12	na	35.7	4.6	104	13.3	na	na	na
1901	5,371	11	22.7	34.4	5.0	105	13.0	96.3	2.4	0.8
1911	7,207	34	23.8	33.0	4.7	113	22.0	97.2	1.5	0.8
1921	8,788	22	23.9	34.4	4.8	106	22.3	97.5	1.3	1.0
1931	10,377	18	24.7	31.6	5.6	107	22.2	97.7	1.2	1.0
1941	11,507	11	27.0	27.8	6.7	105	17.5	97.7	1.4	0.8
1951	14,009	22	27.7	30.3	7.8	102	14.7	97.0	1.2	0.6
1961	18,238	30	26.3	34.0	7.6	102	15.6	96.8	1.2	0.8
1971	21,568	18	26.2	29.6	8.1	100	15.3	96.3	1.5	1.5
1981	24,820	15	29.6	22.3	9.6	98	16.1	< 93.3 ^b	2.0	4.7
1991	28,031	13	33.5	20.7	11.5	97	16.2	< 87.0	3.6	9.4
2001	31,021	11	37.6	18.9	12.6	98	18.4	< 82.3	4.3	13.4

na, Not Available.

^a According to the Canadian Employment Equity Act Aboriginals are not considered visible minorities. Visible minorities include blacks, South Asians, Chinese, Korean, Japanese, Southeast Asian, Filipino, Arab/West Asian, Latin American and others not listed.

^b The white proportion for 1981, 1991 and 2001 was calculated by subtracting visible minorities from the total, so these values are upper limits.

Sources: Basavarajappa and Ram 1983: Tables A78-93, A125-163 and A260-269; Statistics Canada 2002; Table G1 - Summary of Principal Components of Canada's Population 1861–1991.

<http://www12.statcan.ca/english/census01/products/analytic/companion/etoimm/charts/canada/vismin.cfm>

<http://www12.statcan.ca/english/census01/Products/Analytic/companion/abor/charts/abancestry.cfm>

U.S. Census Bureau, International Data Base, <http://www.census.gov/ipc/www/idb/idbprint.html>

was quite young; 42 per cent was under age 15. Reflecting high fertility and the predominance of men in the various immigration streams, the sex ratio was 103 men per 100 women. Finally, the population was nearly all of European origin, reflecting the absence of the slave trade in colonial Canada. However, the European population was divided into anglophone and francophone segments, the former nearly all of British origin and the latter descendents of the original French settlers.

The Canadian fertility transition has not been studied extensively but the broad outlines are described by McInnis (McInnis 2000a, 2000b). As in the colonial period, fertility in the new nation was quite high; one estimate places the crude birth rate for 1851 at 44 per thousand (Haines 2000 Table A2). Whether this represents a decline from a higher level is not known. However, fertility did begin to decline after confederation; estimates for 1901 suggest a crude birth rate of 30 per thousand and a total fertility rate of 4 children per woman (McInnis 2000b). The timing of this change suggests that the Canadian fertility transition may also have preceded mortality decline, although this conclusion is speculative since little is known about nineteenth century Canadian mortality. The decline continued through 1930 at which point the Canadian fertility transition was for the most part completed and the estimated total fertility rate 3.2 children per woman (McInnis 2000b). However, this average conceals considerable ethnic variation. The fertility transition appears to have occurred only in the anglophone segments of the popu-

lation, as fertility in the relatively small francophone population remained relatively high until the end of the baby boom. Vital statistics data became available for Canada beginning in the 1920s. Figure 10.4 uses these data to show Canadian total fertility rates from 1926 to 2003. The Canadian baby boom is prominent in the figure. As in the U.S., fertility increased sharply after World War II and the increase lasted around 20 years. However, even though the time trend is shorter than in Fig. 10.1, the Canadian baby boom also appears to be an anomaly when viewed in the context of long-term fertility decline. Currently, the Canadian total fertility rate is around 1.5 children per woman, well below replacement level. Although it is lower than the total fertility rate in the U.S., this rate is higher than that of many European nations (Statistics Canada 2005).

As noted, very little is known about nineteenth century Canadian mortality (McInnis 2000a). One set of estimates places life expectancy at birth at 41 years in 1851, increasing to 49 years by 1901 (Haines 2000 Table A2). The same source estimates infant mortality rates of 175 per thousand in 1851 and 154 per thousand in 1901. Data on men and women's life expectancy from 1901 to 2001 are plotted in Fig. 10.5, showing steady improvements over the course of the twentieth century. McInnis (2000b) argues that mortality decline in Canada followed the same general outlines as the mortality declines occurring around the same time in other industrialized nations: declines in deaths due to infectious disease, which had a particularly positive

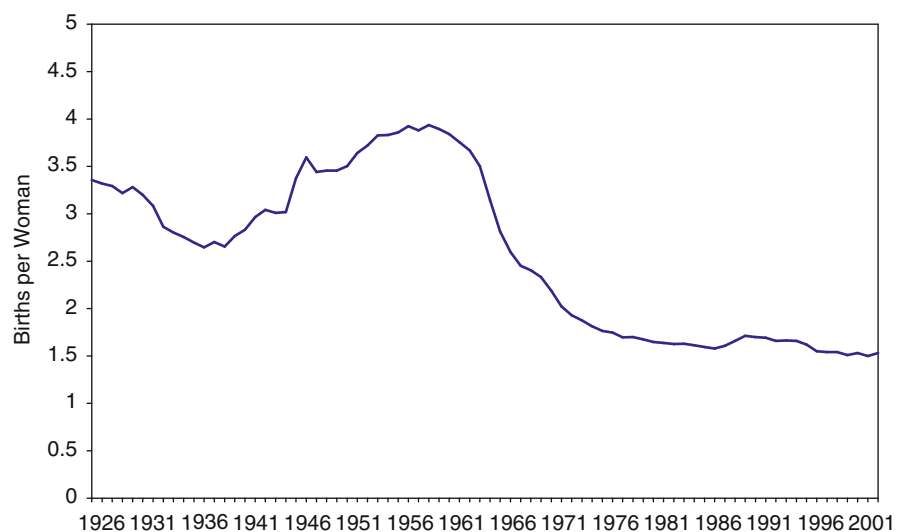
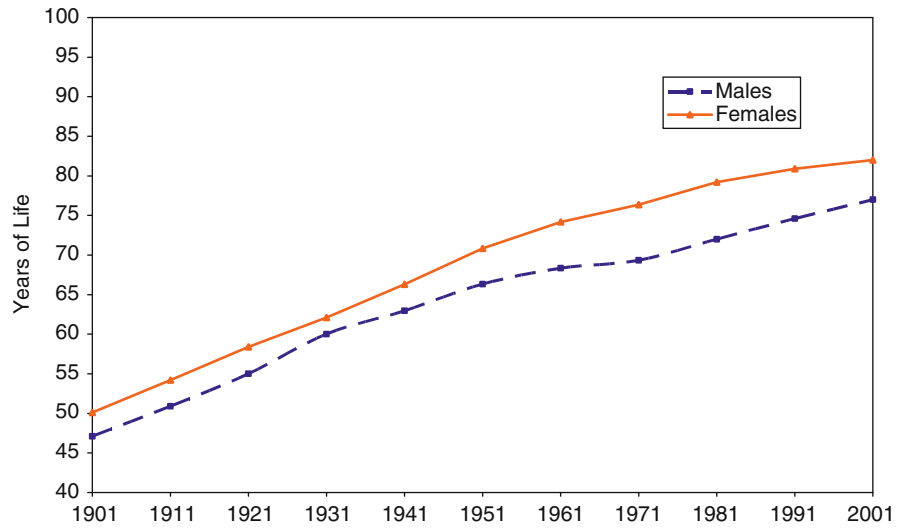


Fig. 10.4 Total fertility rate, Canada, 1962–2003

Note: Total fertility rate is the average number of children born per woman given current birth rates. Sources: Ford & Nault 1996; Statistics Canada 2006a; 2006b; 2006c; 2007b; 2008a.

Fig. 10.5 Life expectancy at birth, Canada 1901–2001

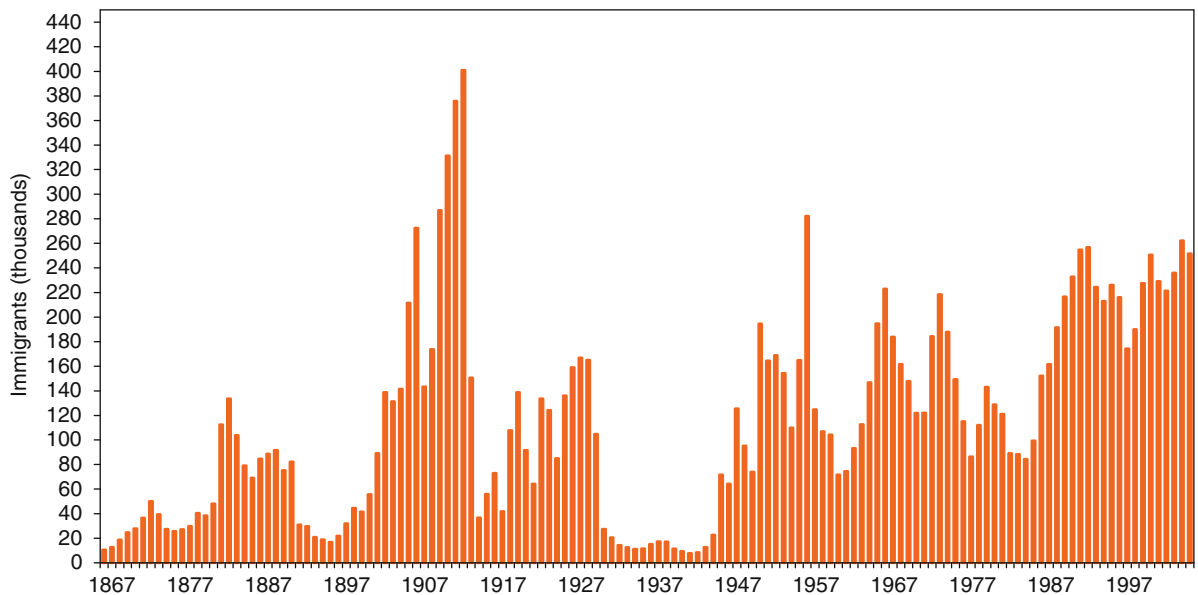


Sources: Statistics Canada 1999a; 1999b; 2006c; 2008.

impact on infant and child mortality, followed later in the century by declines in adult mortality. Canadian variations from this pattern include relatively high infant mortality in the francophone population prior to and in the first decades of the transition and probable reductions in adult deaths early in the transition due to declines in tuberculosis mortality, a cause of many adult deaths. In 1999, Canadian life expectancy was among the best in the world, the third highest among

OECD nations and higher than the U.S. (Statistics Canada 1999a).

As a nation with European colonial roots, migration has been an important factor in Canadian population change. The number of immigrants entering Canada each year between 1867 and 2007 is graphed in Fig. 10.6. As in the comparable figure for the U.S., these are absolute numbers, not rates and the Canadian population increased greatly over this time. Nevertheless, the



Source: Citizenship and Immigration Canada 2007.

Fig. 10.6 Number of immigrants, Canada 1867–2006

temporal variation in immigration is apparent. Between 1871 and 1901 Canada actually lost more citizens to emigration than it gained from immigration – many of these to the U.S.; in fact, rates of emigration in this period of Canadian history were on a par with those of the European nations with the highest rates of emigration to North America (McInnis 2000a). This trend was reversed in the twentieth century, during which immigration was a key component of population growth. In the first three decades of the century, immigration to Canada reached dramatic highs. In 1913, the peak year, 400,000 people immigrated to Canada, increasing the Canadian population by nearly 7 per cent. Between 1901 and 1911, the immigration rate was nearly three times that of the U.S., which was also experiencing a large and legendary influx of immigrants. However, net migration to Canada was lower than immigration statistics suggest, due to a combination of return migration and emigration to the U.S. (McInnis 2000a). After declining due to policy changes and two World Wars, immigration to Canada rose and remained relatively high after World War II. Beginning in the 1970s, Canada experienced a shift towards non-European immigrants similar to that experienced in the U.S, with the exception that Canada experiences very low immigration from Mexico, a major source for the U.S.

Table 10.2 shows how these demographic trends were manifested in the characteristics of the Canadian population at each decennial census since confederation. Population growth was positive over the entire period but exhibited considerable fluctuation. In the late nineteenth century, declining fertility and emigration combined such that the Canadian population grew at a modest 1 per cent a year; while in the twentieth century, higher immigration led to population growth that averaged 1.7 per cent per year (McInnis 2000a). However, the latter rate averages decades of extraordinary growth and decades of more moderate growth. Patterns of immigration are also mirrored in the percentage of the population that was foreign born at each census; this figure was 22 per cent from 1901 to 1931 and in the succeeding decades never fell below 14 per cent. The long-term aging of the Canadian population is also visible in Table 10.2. The median age increased steadily over the time period, while the proportion of the population under age 15 declined and the proportion over age 65 increased. The demographic history of Canada strongly suggests that population aging was a feature

of the nineteenth century as well. Again, aging in the nineteenth and twentieth centuries reflects declining fertility and mortality; while the net impact of immigration is unclear. Thus, as in the U.S., population aging does not appear to be of recent origin in Canada, undermining the “crisis” viewpoint.

Finally, the Canadian population remained more than 90 per cent white, which is of European origin, through the 1981 census. This relative homogeneity reflects the absence of the slave trade, which established a large African population in Canada’s neighbor to the south and the dominance of Britain as a source of immigration until the early twentieth century. However, changes in the origins of the immigration stream are manifest in the striking increase in the proportion of visible minority Canadians between 1971 and 1981. Although Canada has a heritage of immigration, leading to large percentages of foreign-born residents, only recently has immigration resulted in racial/ethnic heterogeneity.

Looking to the Future

Taking a long view of population change in the U.S. and Canada makes clear that population aging is the long-term result of changes in fertility, mortality and, to some extent, immigration. The long view also makes clear that population aging is not a transient phenomenon, as it reflects deep social, economic and demographic transformations.

Tables 10.3 and 10.4 show the projected age structure of the U.S. and Canadian populations over the next 50 years. According to these projections, both populations will continue to grow older, although in both nations the pace of aging will slow towards the end of the period. Like all projections, the projections shown in the tables are based on specific assumptions about future change in the basic components of population change and thus are correct only to the degree that the assumptions are correct. Because of the inherent uncertainty surrounding population projections, demographers calculate multiple projections, using various underlying assumptions to illustrate the range of possible outcomes. Thus, for example, increases in longevity now come from declines in death rates at the oldest ages and different projections incorporate various rates and patterns of decline. The figures in Table 10.3 are from the U.S.

Table 10.3 Median age, per cent under age 15, per cent over age 65 and per cent over age 85, United States 2000 and projected to 2050

	Median age	Per cent under age 15	Per cent age 65 and over	Per cent age 85 and over
2000	35.3	21.4	12.4	1.6
2010	37.0	20.0	13.0	2.0
2020	38.0	20.0	16.3	2.2
2030	39.0	19.7	19.7	2.6
2040	39.0	19.6	20.4	3.9
2050	39.0	19.7	20.7	5.0

Figures for 2010–2050 are “medium variant” projections.
Sources: U.S. Census Bureau 2007 Table 11; 2004b.

Census Bureau’s 2004 projections, which are based on the “middle series” assumptions developed for the 2000 projections, updated to include information from the 2000 census (United States Census Bureau 2004a). The figures in Table 10.4 are from Statistics Canada’s 2005 projections, specifically “Scenario 3”, which also incorporates middle range assumptions about future demographic change (Statistics Canada 2005). However, under all of the assumptions utilized by the two statistical agencies, which together represent a range of probable demographic changes in each nation, the U.S. and Canadian populations will continue to age for the next fifty years. The differences across projections are in the degree of this aging but these differences are relatively modest (Statistics Canada 2005; United States Census Bureau 2000a, 2004b). The pace of population aging is projected to slow in the future, because fertility rates have remained relatively stable and are expected to stay that way and mortality declines at the oldest ages will most likely be incremental.

Concerns over the consequences of population aging have led to questions about whether population

aging can be reversed or moderated. This depends on the extent to which the underlying population processes can be manipulated and whether they can be changed to the extent needed. Few people would advocate increasing mortality, or even halting mortality decline, as solutions to population aging. Increasing immigration has been proposed as a potential solution to population aging in developed nations (Cutler et al. 1990; Merette 2002; United Nations 2001). This option seems especially attractive in the U.S. and Canada given their long traditions of immigration. However, several studies show that only massive, sustained increases in immigration would slow population aging (Espenshade 1994; United Nations 2001). Despite the nations’ histories of immigration, accommodating massive flows of immigrants would likely strain national capacities for integrating newcomers. Moreover, continuing controversies surrounding immigration in the U.S. suggest that immigration high enough to offset population aging would be politically unfeasible.

Cheal (2000) argues that a dramatic increase in fertility is the only action that can significantly alter

Table 10.4 Median age, per cent under age 15, per cent over age 65 and per cent over age 85 Canada 2001 and projected to 2051

	Median age	Per cent under age 15	Per cent age 65 and over	Per cent age 85 and over
2001	37.6	18.9	12.6	1.4
2011	40.1	16.0	14.4	1.9
2021	42.2	15.2	18.7	2.2
2031	44.3	14.6	23.4	2.9
2041	46.1	13.8	25.1	4.5
2051	46.7	13.6	26.5	5.8

Figures for 2011–2051 are “Scenario 3” projections.
Sources: Statistics Canada 2005; 2008; Table 10.2.

projected population aging, as fertility is a much more efficient means of altering the population age-structure than immigration (Henripin 1994). Even though fertility is much more difficult to influence through social policy than immigration, pronatalist policies have been suggested in an attempt to slow down or even reverse population aging (Denton et al. 1998). Empirical studies of the “Allowance for Newborn Children” offered by the Government of Quebec between 1988 and 1997 find evidence that this pronatalist policy did increase fertility (Kim 2007; Milligan 2002). While these programs can be costly (Milligan 2002), less costly accommodations can be made that facilitate the combination of work and family life (such as maternity and family leave policies, day care, flexible work schedules) and make it easier to have children (Henripin 1994).

However, policies and practices aimed at increasing fertility may not be the magic answer to population aging. Fertility rates would have to rise dramatically and remain high to have any appreciable effect on population aging and even then aging would only be slightly slowed (Denton et al. 1998). In addition, while another baby boom might address some of the concerns associated with population aging, the benefits will not be realized for twenty years or more after fertility levels have risen (Denton and Spencer 2000; Henripin 1994). In the meantime, governments and planners would have to worry about providing services for a larger cohort of youth at the same time as they are under increased pressure from a larger cohort of older adults (Denton and Spencer 2000). While a dramatic increase in fertility would affect the population age structure it would not change the fact that the absolute number of elderly individuals in the population will increase as a result of the aging baby boomers and if higher fertility rates were not maintained the cycle could repeat itself in the future.

Population aging is typically viewed in pessimistic terms. While aging populations do pose challenges for societies, as we argue later, some of the apparent challenges discussed in the U.S. and Canada are not attributable to population aging and few of the real challenges are unsolvable. Furthermore, the populations of Canada and the U.S. are considerably younger than those in most European nations. Finally, when considering the consequences of population aging, it is well to remember that it is the outgrowth of many positive changes – for example, increases in longevity, couples’ control over the number of children they have and higher standards of living. The long view of population change shows the

profundity of the shift to an aging and older population. At the same time, it places the shift alongside the many social changes that have transformed human lives and elicited human adaptation. This perspective promotes clearer thinking about the population aging “crisis” by showing how such challenges and many larger ones, have been met in the past.

The Elderly Populations of Canada and the United States

To a certain degree, concerns about population aging in Canada and the U.S. reflect cultural ideas about what it means to be old. For example, ensuring the economic well-being of the aged and meeting their needs for health services and long-term care are central to debates about population aging in both nations. Underlying these concerns is the assumption that older people are economically dependent and in frail health. These assumptions rest in part on fact. As we discuss in the next section, in both nations, large public entitlement programs provide income and medical care to older people. Because of physiological aging, older people are also more likely to be in ill health than younger people.

At the same time, however, the elderly as a group are far from homogeneous in both the U.S. and Canada. One reason for this heterogeneity is that increases in longevity mean that more years of the life course are included in “old age”. In both nations, old age conventionally begins at age 65, largely because this is the age at which people become eligible for public programs for the aged. Between 1901 and 2000, life expectancy at age 65 increased by 6 years in the U.S.; two-thirds of this gain occurred between 1950 and 2000 (United States Bureau of the Census 2005). In Canada, life expectancy at age 65 increased by 6 years between 1921 and 2003 and an even larger fraction of this gain was concentrated in the last fifty years (Turcotte and Schellenberg 2007). Along with increases in life expectancy have come increases in *active* life expectancy, the years a person can expect to live disability free (Robine 2004). Thus these added years are generally years of healthy life, increasing the physical and social variability in the over 65 population. Clearly, the convention that old age begins at 65 is being challenged by empirical reality. This challenge raises important questions about the nature and mean-

ing of both physiological and social aging. We return to this point in the final section of the chapter.

A second source of heterogeneity in the older population is variation across individuals in both physiological aging and the way the later life course unfolds. As a result, even people of the same chronological age may have different physical, cognitive, or social profiles and divergent resources and needs. These differences reflect in part ascribed characteristics such as gender and race/ethnicity and achieved characteristics such as socioeconomic status and family structure. In turn, these characteristics reflect the constraints, opportunities and outcomes embedded in people's life histories, all of which affect how they age.

This variation in the characteristics and life histories of the aged exists not only at a point in time but occurs over time. Turnover in the individuals making up the older population from year to year and decade to decade occurs by a process of cohort replacement. That is, the cohort that is currently ages 60–64 will be in the 65–69 age category five years from now, the cohort that is currently ages 55–59 will fill the 65–69 age bracket ten years from now and so on. In short, the elderly of tomorrow are the middle aged and young of today. Due to social change, successive cohorts are likely to differ in their characteristics and life experience and in the ways that these factors shape the process of aging. As current elderly cohorts are replaced by cohorts born later, the characteristics of “the” aged population will change, introducing variation over time (Mannheim 1952; Ryder 1965).

Although the elderly populations of both Canada and the U.S. are heterogeneous, the degree and type of this variability differs somewhat between the two nations. These national differences reflect the nations' distinct demographic, social and economic histories as summarized in the previous section. Thus, for example, the current elderly population in the U.S. is more heterogeneous with respect to race/ethnicity than the Canadian elderly population; however the Canadian elderly population has a higher percentage of immigrants. In the future, national cross-sectional profiles of the elderly will continue to reflect the nations' distinct histories. However, the similarities in the *changes* to be expected in the elderly populations of the two nations are striking. In the post-World War II era, both nations experienced similar, large-scale social change. As cohorts who participated in these changes enter old age, they will transform the face of the elderly in the U.S. and Canada. This

transformation will begin with the aging of the baby boom cohorts, as they represent the leading edge of these social changes (Hughes and O'Rand 2004).

The Aging of Social Change in the United States and Canada

Age and Gender

The population over age 65 is usually divided into the young-old (ages 65–74), the old-old (ages 75–84) and the oldest-old (85 and over). On average, these age groups differ, with the oldest-old most likely to be dependent and in need of care. Thus, the needs of the elderly population as a whole will change as cohorts of different sizes move through the young-old, old-old and oldest-old age groups, shifting the proportion of the aged in each group. In 2000, 53 per cent of the older population in the U.S. was young-old, 35 per cent old-old and 12 per cent oldest-old; comparable figures for Canada in 2006 were identical (Statistics Canada 2008; United States Bureau of the Census 2005). As members of the baby boom cohorts in both nations begin to turn 65 in 2011, they will swell the ranks of the young-old relative to the old-old and oldest-old; this imbalance will be moderated as more of the baby boom cohorts – who were born over 19 years in the U.S. and 20 years in Canada – enter old age. As the final baby boom cohorts move into the highest age groups, the age distribution will tilt towards the oldest-old. Subsequent shifts in the age structure of the older population should be less dramatic. However, changes in relative death rates at older ages (e.g., larger declines in death rates among the oldest-old relative to the young-old and old-old) can also shift the age distribution of the elderly population and, unlike the relative sizes of cohorts, the future course of these changes is unknown.

Because death rates for men are generally higher than death rates for women around the world, the sex ratio (the number of men per 100 women) in the older populations of the U.S. and Canada favors women. This imbalance becomes striking among the oldest-old: for example in the U.S. in 2000, the sex ratio was 82 among the young-old and 41 among the oldest-old. The preponderance of women is significant to the extent that the needs of older women are differ-

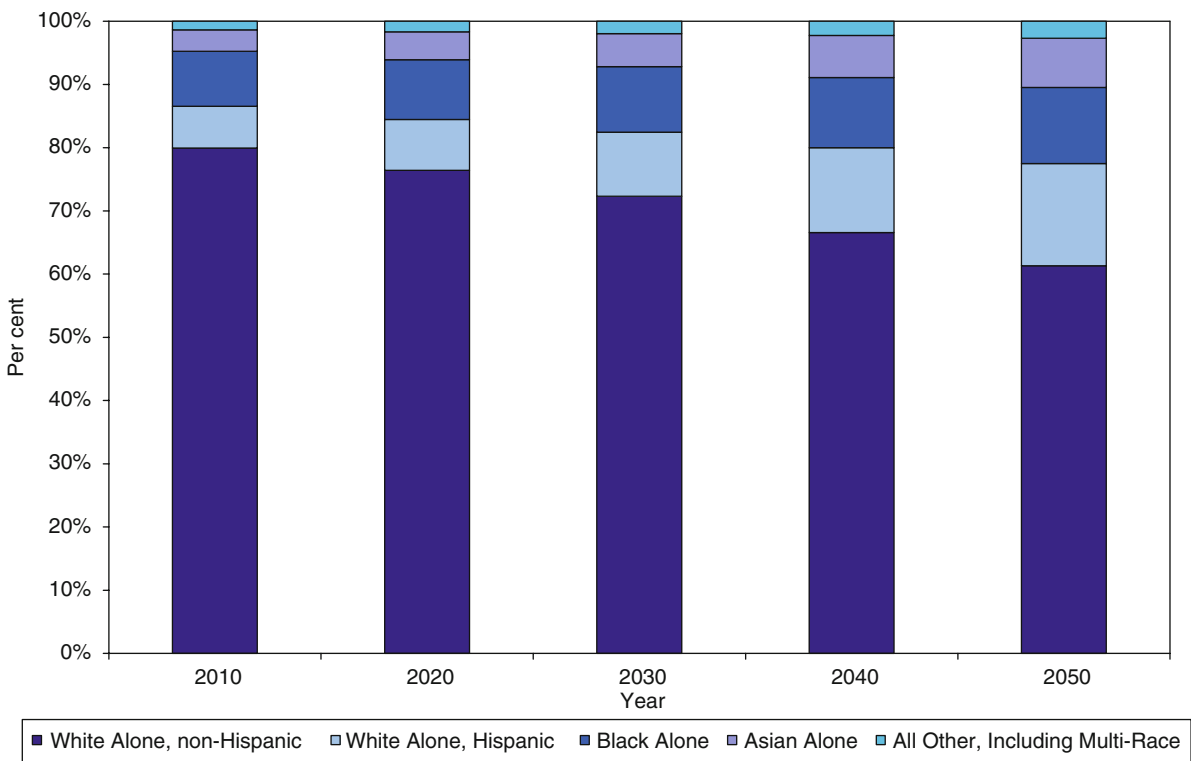
ent from the needs of older men. For example, due to gender differences in death rates, many older women are widowed, while many older men are married to living spouses able to care for them. Future changes in the sex ratio will only occur if the gender differential in mortality across the life course changes substantially, which seems unlikely.

Race / Ethnicity and Nativity

As described in the previous section, the populations of both Canada and the U.S. are multiethnic, although to different degrees. In the U.S., several racial groups, including a multiracial group, are distinguished, as well as Hispanic ethnicity. In Canada, the population is typically divided into three race/ethnic groups: white, aboriginal and visible minority. The three largest visible minority groups in Canada are Chinese, South Asian and Black, which together represent 65 per cent of Canada’s visible minority population (Statistics Canada 2003a). In these two immigrant nations, nativ-

ity is also an important social characteristic and often crosscuts minority status; members of minority groups may also be immigrants and immigrants differ from native-born members of the same group.

A great deal of research in both the U.S. and Canada attests to the relative disadvantage of members of minority groups. Thus members of minority groups are likely to enter old age with poorer health and fewer resources than majority whites, especially in the U.S. However, minorities are not always disadvantaged: U.S. Hispanics are advantaged relative to whites on some dimensions of health and Asian-Americans economic achievement outstrips that of whites. Members of various groups bring these advantages and disadvantages to old age where they help to shape how they age and the needs they experience. Cultural differences among race/ethnic groups may also differentiate the aging process; for example shaping preferences about the relative roles of family and institutional care for the aged. Nativity becomes important to the extent that economic or cultural differences are more pronounced among the foreign-born.



Source: U.S. Census Bureau 2004a.

Fig. 10.7 Projected distribution of U.S. population age 65 and over, 2010–2050

These issues will become increasingly salient in the future because the older populations of both Canada and the U.S. will become more heterogeneous in terms of race/ethnicity. Figure 10.7 presents projected race/ethnic distributions of the U.S. population over age 65 from 2010 to 2050. In this race/ethnic categorization, the proportion of Hispanics is understated, as only Hispanics who identify themselves racially as white alone are shown separately in the figure; the others are combined with the race with which they identify. However, the pattern is quite clear: the higher levels of immigration and changing origins of the immigrant population will increasingly be reflected in the older population. Figure 10.8 shows the percentage of Canadians who were native born, foreign born, and a visible minority and foreign born, and not a visible minority in 2006. The distributions are shown separately by age group to illustrate how recent increases in immigration and the changing composition of the immigrant stream will eventually be manifested in a more heterogeneous older population. These changes have important implications for those working with older adults as interactions and services may have to be tailored to be sensitive to a variety of cultural beliefs and attitudes.

Health

Health status is one of the primary factors driving the need for support and care in late adulthood. Many

dimensions of health are important, including chronic disease, physical functioning, disability, cognitive impairment and mental health, as well as the extent to which people experience co-morbidities and the severity with which conditions are experienced.

Table 10.5 presents the prevalence of selected conditions in the elderly population in Canada and the U.S. Two general patterns are clear from the table. First, with the exception of diabetes, the prevalence of each condition increases with age. Second, although the prevalence of these conditions is high, they are not universal; even the most common condition (arthritis) affects only slightly more than half of the old-old and oldest-old populations combined. This is not to downplay the importance and severity of health issues in old age; however at times the variability in health status within the elderly population is under-emphasized.

At the same time individuals are living longer, healthier lives – this increased life expectancy brings with it increased risk of experiencing some form of dementia. Approximately 10 per cent of adults 65 or older are afflicted with some form of dementia, with the prevalence increasing from approximately 1.5 per cent of 65–69 year olds, to 16.1 per cent of 85–89 year olds, up to more than 50 per cent of individuals 90 years of age or older (Alzheimer Society of Ontario 2007). As the number of older individuals increases so does the number of individuals living with some form of dementia. Alzheimer’s disease (AD) is

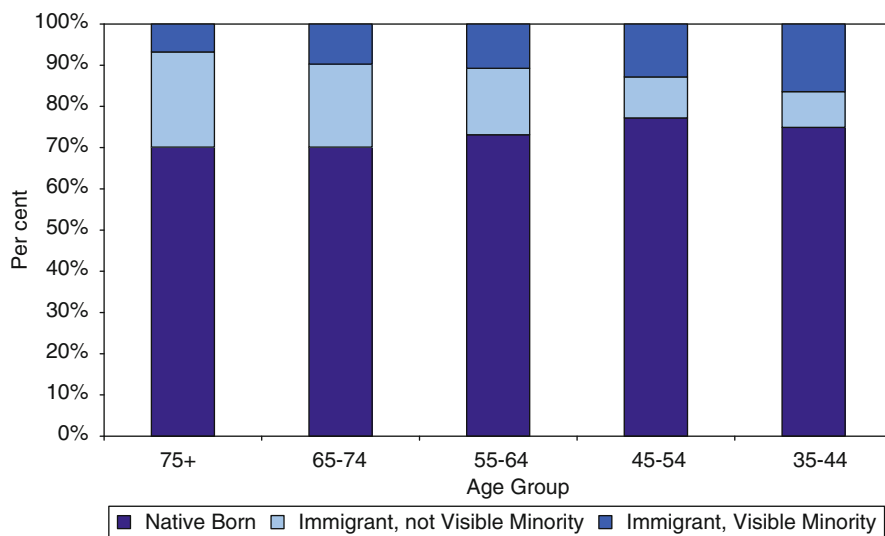


Fig. 10.8 Distribution of the Canadian population by nativity and visible minority status, by age, 2006

Source: Statistics Canada 2008b.

Table 10.5 Prevalence of selected chronic conditions among the population age 65 and over in Canada (2003) and the United States (2003-2005)

	Canada, 2003			United States, 2003-2005		
	65+	65-74	75+	65+	65-74	75+
Hypertension	42.8	41.0	45.2	52.0	49.4	54.8
Heart Disease	19.8	15.7	25.3	31.7	27.1	36.8
Diabetes	13.5	14.1	12.7	17.0	18.2	15.6
Arthritis	47.3	44.2	51.5	50.5	46.5	54.0
Cancer, Ever	5.5	5.0	6.2	21.0	18.6	23.7

Sources: Statistics Canada 2007; National Center for Health Statistics 2008.

the most common form of dementia and it is projected that the prevalence of this disease amongst the United States population will quadruple over the first half of the 21st century, by which time approximately 1 in 45 Americans are anticipated to have AD (Brookmeyer et al. 1998). Caring for older adults with AD and other forms of dementia is often more time consuming and involves more negative employment, social and mental and physical health consequences than caring for a non-demented older adult (Ory et al. 1999). Formal health care costs are also higher for dementia patients, mostly due to the cost of institutional care and assistance with activities of daily living in the community (Ostbye and Crosse 1994). Research shows as many as 90 per cent of individuals diagnosed with dementia eventually enter a nursing home (Smith et al. 2000). The high personal, family and societal costs of dementia, combined with the age-related prevalence of dementia and population aging will have a profound influence on the impact and experience of aging in the future.

Economic Status, Family Structure and Geographic Location

Profound social change, including economic restructuring, technological development, globalization and shifts in ideas about individual self-expression and autonomy, has led to greater variation in the life course in cohorts born after World War II (Hughes and O'Rand 2004). These cohorts will bring their diverse life histories to old age, increasing heterogeneity among the elderly on a number of dimensions.

The personal economic resources with which people approach old age have implications for both how

people age (e.g., whether they can afford to leave the labor force) and whether they can afford to pay for any care they require. Due to national differences in the social safety nets provided to the elderly, especially health care, the importance of personal resources differs between the U.S. and Canada. These differences will be discussed further in the next section. Economic resources also affect the aging process through their influence on health over the life course; in general higher socioeconomic status protects health, while persons of lower socioeconomic status are vulnerable to more health problems and develop these problems earlier in life.

Income levels among the elderly vary according to work status, personal wealth and whether individuals can claim pension income. Among those who continue to work, the circumstances and rewards from participation in the labor force vary as well. Thus, for example, workers with higher education may continue to work and earn substantial incomes because of attachment to an interesting career, while workers with less education may continue to work at low-skill jobs due to economic need and earn much less. In both the U.S. and Canada, income maintenance programs for the elderly act as a floor on elderly income levels; historically, these programs substantially reduced poverty among the elderly. At the same time, however, elderly persons who have no other source of income may have difficulty meeting their needs.

The economic status of future cohorts of the elderly presents something of a paradox. On the one hand, in both the U.S. and Canada, the secular increase in levels of education mean that future elderly will be better educated, with commensurate increases in average income and wealth (Clark 2000). At the same time, variabil-

ity in income and wealth appear to have increased in the baby boom cohorts, suggesting greater economic inequality in future cohorts of elderly (Hughes and O'Rand 2004; Osberg 2003).

The important role of the family in providing care for frail elderly is emphasized in discussions of family and the elderly. However, family relationships in later life are salient beyond caregiving. Family members are central to individuals' social networks and as such shape personal health and well-being along a variety of dimensions (Hughes and Waite 2004). Family structure (e.g., marital status, whether a person has children) and relations (e.g., emotional closeness to family members, exchanges among family members) in later life reflect the development of family relationships over a lifetime.

The families of future cohorts of elderly will differ remarkably from those of current elderly. Canada and the U.S. have participated in what has been termed the Second Demographic transition, that is, the revolution in family life that began in the late 1960s (Les-thaeghe 1995). Central to this transition have been delays in marriage, increases in non-marital cohabitation and non-marital childbearing, higher likelihoods of divorce, greater variation in the timing of parenthood and increases in the likelihood that people will live alone (Casper and Bianchi 2002). These changes have in turn diversified family structure and relationships over the life course, as some individuals experience complicated family histories, while others follow paths that are more "traditional". The consequences of these changes for younger generations, especially for children, have been well studied but their implications for later life are unclear (Hughes and Waite 2007).

The geographic communities in which older people live define the local family and social networks that they may draw on for support, the services that are available to them and the physical environment (e.g., climate, built environment) that they must cope with. From the perspective of communities, the proportion of elderly in the local population influences the services that governments need to provide and many aspects of community character, from tax and electoral bases to the nature of local commercial enterprises. Communities may of course be defined at many levels and several levels are salient to population aging in the U.S. and Canada, including rural vs. urban communities, states and provinces and localities (cities and neighborhoods).

Currently, the elderly are distributed somewhat unequally across the landscapes of Canada and the U.S. (Statistics Canada 2007; United States Census Bureau 2005). Rural communities have higher proportions of elderly than do urban communities and some states and provinces have higher proportions of elderly living in them than the nation as a whole. However, imbalances in the distribution of elderly are most pronounced at local levels, such that some towns and neighborhoods have substantially higher concentrations of elderly than others.

The geographic distribution of future elderly will depend on three factors: their geographic distribution in middle age, their likelihood of moving in later life and geographic shifts in the distribution of other age groups. Geographic mobility is typically low in later life; most people "age in place", so the geographic locations of members of future cohorts when they begin to age will have a large impact on their geographic distribution in later life. Recent data suggest that the populations of both Canada and the U.S. are increasingly concentrated in urban areas and on the coasts and in the U.S., the south. This suggests that future cohorts of elderly may be similarly concentrated – and thus less geographically diverse than prior cohorts. When older people do move, their reasons include adjusting their housing situation to accommodate physical limitations or a decreased need for space, moving closer to kin and moving for amenities. If these underlying motivations are different in future cohorts of elderly, rates of elderly mobility may change. Finally, just as for national populations, the age structure of a community's population depends on changes in the size of *all* age groups in the population. For example, much of the concentration of elderly in rural areas is due to the out-migration of younger people.

The Meaning of Heterogeneity

The older populations of Canada and the U.S. are more heterogeneous than is sometimes assumed. Discussions that focus on the needs of dependent and frail elderly ignore the many elderly who are independent and healthy and reify the dominant cultural image of the elderly. As the baby boom cohorts and those born after them move into old age, they will increase this heterogeneity in two ways. First, there will be an

increasing array of statuses and characteristics among the old. For example, the older population of Canada will begin to include members of new visible minority groups. Second, the population will be more evenly distributed among existing categories. Thus, greater fractions of older people will enter later life having been divorced and remarried than in the past (Hughes and Waite 2007). Some of the forces shaping the lives of future elderly, such as improvements in the treatment of chronic disease, are unknown; and in a few respects future elderly may be less heterogeneous than current elderly, for example in geographic distribution. Nevertheless, the characteristics of cohorts who will be elderly in the future suggest that, on balance, the elderly will become more heterogeneous.

The key question is what this heterogeneity implies for individuals as they age and for the societies in which they age. At one level, greater heterogeneity in the population can be regarded as adding interesting but inconsequential color to the Canadian and American mosaics. However, to the extent that variation in race/ethnicity, health status, economic well-being and family structure increases or changes the needs of elderly population, it is a major concern. At a broad level, greater heterogeneity may mean that the older population has a wider variety of needs, which will be difficult to target with one-size-fits-all policy. Heterogeneity may also increase the likelihood that policies targeted to one group or need have unintended negative consequences for other groups (Hughes and O'Rand 2004). Identifying which characteristics of the population matter for population aging and related policy is an important priority. In the next section, we review key policy issues raised by population aging in the U.S. and Canada; the reader should bear in mind how heterogeneity in the aged population may affect these policies and their reforms.

Population Aging, Intergenerational Equity and Social Policy in the United States and Canada

Population aging would not be such a hot topic of debate or cause for concern if the behaviors and needs of individuals did not change as people age or if government programs were not tied to age as a criteria for eligibility (Merette 2002). Discussions surrounding the

distribution of public resources to various age groups are often couched in terms of intergenerational equity, which refers to the fairness of the relative burdens and opportunities faced by different age groups in a population (Marshall et al. 1993). Population aging is driving a central theme in the intergenerational equity debate: that the young are being deprived of opportunities due to the burden of supporting the old, who are receiving an unfair share of societal resources (Foot and Venne 2005). Here we identify some of the most salient policy issues raised by population aging and the intergenerational equity debate and discuss the current and future state of these policies.

Income Security

When older adults withdraw from the labor force they need to secure alternate sources of income in order to maintain their standard of living. Income security for older adults in the U.S. and Canada comes from three potential sources: 1) guaranteed minimum income and disability insurance, 2) public pensions and 3) private pensions and personal savings. This mix of public and private funding facilitates an ongoing debate about the distribution of public versus private responsibility in financing later life. In light of population aging, questions are being asked about the ability of the governments in both countries to continue the current level of publicly funded benefits and the design of these programs is being carefully scrutinized. In particular, pay-as-you-go public pension systems are particularly vulnerable to population aging and dissatisfaction with the consequences often fans the fires of the intergenerational equity debate. Here we describe how these three sources of income operate in Canada and the U.S. and discuss the long-term outlook for the income security of future cohorts of older adults.

Guaranteed Minimum Income

Both Canada and the U.S. have government programs that ensure a guaranteed minimum income for older adults, which are not contingent on prior labor force participation. The Old Age Security (OAS) program

in Canada ensures that all seniors in Canada receive a modest base income. The OAS program is financed from federal general tax revenues and consists of: 1) an Old Age Security Pension available to most Canadians over age 65 provided they meet certain residency requirements, 2) a Guaranteed Income Supplement (GIS), which low-income seniors receive in addition to the Old Age Security Pension and 3) an Allowance, which provides benefits under certain conditions for a spouse or common-law partner of someone who receives the Old Age Security Pension and GIS, or a survivor (Statistics Canada 2003b).

The U.S. does not have a program of guaranteed minimum income directed specifically to the elderly; however, older adults with little to no income or assets can apply for Supplemental Security Income (SSI) (Social Security Administration 2007b). SSI is available to the blind, the disabled and the elderly, provided they meet the income requirements and pass an asset test (McGarry 1996). This program, which is funded from general tax revenues, provides a very small guaranteed income, as the maximum SSI benefit is only about 75 per cent of the federal poverty level. Thus recipients must rely on other government programs and community services just to reach the poverty level and to have access to health care (Applebaum and Payne 2005).

The SSI program in the U.S. and the OAS program in Canada are both indexed for inflation and financed from general tax revenues. As a result, they will potentially require even larger portions of the governments' budgets as the sizes of the elderly populations grow. However, government forecasters predict only a small increase in the proportion of the U.S. population who will receive SSI benefits over the next 25 years (Social Security Administration 2007a). The age structure of the population has only a small impact on this program as only about 20 per cent of SSI recipients are age 65 and older (Applebaum and Payne 2005) and many older Americans who qualify for the program never apply (McGarry 1996). Even with the predicted growth in SSI recipients over the next 25 years, the real growth in the Gross Domestic Product (GDP) over this time is anticipated to more than compensate for the increased program costs, resulting in projections that SSI payments will actually decline from 0.285 per cent of GDP in 2005 to 0.243 per cent of GDP in 2031 (Social Security Administration 2007a).

The long-term outlook for guaranteed minimum income benefits in Canada is also promising. Changes to the OAS pension over the past twenty years have reduced the cost of the program, making it more viable. Between 1989 and 1991 a tax-back (or claw-back) mechanism was introduced that requires higher income seniors to repay part or all of their OAS pension (Northcott 1994) and in 1996 the reduction in benefits for high-income seniors began to be deducted at the source rather than being taxed back (Statistics Canada 2003b). So, while the number of people receiving OAS pensions will increase in the future, not everyone will receive the full amount. In general the projected future increase in expenditures for the OAS program as a result of population aging does not appear to be drastic (Roberts 2003). Over the past few decades the proportion of OAS recipients receiving GIS benefits has declined and a smaller proportion of GIS and Allowance recipients are qualifying for the maximum amount due to higher incomes from other sources than in the past (Statistics Canada 2003b). As the Canadian population ages the cost of the OAS program is projected to increase from 2.3 per cent of GDP in 2004 to a high of 3.2 per cent in 2030, declining thereafter to 2.0 per cent by 2075 (Chief Actuary of Canada 2003).

Public Pensions and Disability Benefits

Both the U.S. and Canada offer pension plans and disability benefits that are funded through payroll taxes. Individuals in both countries who are unable to work and are receiving disability benefits become incorporated into their respective pension plans when they reach retirement age. In the U.S., the public pension and disability benefits are known as Social Security and consist in two separate government programs: Federal Old-Age Survivors Insurance (OASI) and Disability Insurance (DI), which together are known as OASDI (Hakkio and Wiseman 2006). In Canada, the Federal Government administers the Canada Pension Plan (CPP) that covers workers in all provinces and territories except Quebec, which administers its own plan known as the Quebec Pension Plan (QPP) (Statistics Canada 2003b). While the exact details of how pension benefits are calculated vary between the three programs, in general benefits received are indexed for inflation, tied to age at retirement and depend on how much and how long an individual has

contributed to the plan (Social Security Administration 2008; Statistics Canada 2003b). Under certain conditions family members can receive pension benefits as well.

A portion of income from Social Security is taxable (Social Security Administration 2008), while CPP/QPP benefits are taxed in the same way as regular income (Statistics Canada 2003b). As a result a portion of the benefits paid out are returned to the government (Denton and Spencer 2000), with the taxes on Social Security in the U.S. specifically earmarked for the Social Security program and Medicare, the government health insurance for the aged (Hakkio and Wiseman 2006).

The anticipated growth of the older populations in Canada and the U.S. will substantially increase the cost of maintaining these pension programs, yet there is considerable diversity in the long-term viability of each. The future outlook for the Social Security program in the U.S. is troublesome. In response to increases in life expectancy, the U.S. enacted a policy that is gradually increasing eligibility for full Social Security benefits from 65 to 67 by 2027 (Social Security Administration July 1999). While this change delays the receipt of full Social Security benefits and reduces the overall cost of the program, the long-term solvency of the Social Security program is still in jeopardy.

The Social Security program is principally a pay-as-you-go system, meaning that revenues received from current tax-payers are used to provide benefits to current recipients (Hakkio and Wiseman 2006). Over the past few decades Social Security tax revenues exceeded expenditures, allowing for the creation of the Social Security Trust Funds (one for each program). Despite their name, these Funds are not accounts where tax revenues are paid in and benefits paid out. Rather, they are an IOU from the U.S. government, which has been using these excess funds for other programs (Palmer 2006). The government credits the Trust Funds on paper with the amount that tax revenues exceed benefits, adding interest in exchange for using the funds; however this interest is simply an intergovernmental transfer and does not represent a new source of revenue for the government (Hakkio and Wiseman 2006).

According to the most recent report from the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Fund (2008) annual costs of the Social Security program will begin to exceed tax income beginning in 2017. To make up for

the annual shortfall, the government will have to either begin taking money from other programs or increase the federal deficit to repay the IOU in the Social Security Trust Funds (Palmer 2006). The combined trust funds are projected to be depleted in 2041 (Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Fund 2008), after which benefits paid out will not be allowed to exceed dedicated tax revenue (Hakkio and Wiseman 2006). At that time the government will have no choice but to either increase taxes, redirect money from other government programs, or restrict or reduce benefits, as income from tax revenue will only cover 75–78 per cent of promised benefits between 2041 and 2082 (Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Fund 2008).

The Social Security Board of Trustees has been warning the U.S. government about the financial jeopardy of the Social Security program for decades and since 1991 has recommended that some form of action be taken (Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Fund 1991). As time moves on, the Board of Trustees has been ever more concerned about the lack of action on the part of the government to adequately address this problem (Social Security and Medicare Boards of Trustees 2008). While increasing the extent to which benefits are taxed in 1993 and increasing the minimum age for eligibility for full-benefits has reduced the overall cost of the program, these actions do not even come close to ensuring the long-term viability of Social Security. The cost of Social Security benefits to be paid out over the next 75 years exceeds income from tax revenue by 7 trillion dollars (Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Fund 2008). The problem only becomes more difficult to manage the longer reforms are delayed (Hakkio and Wiseman 2006). An immediate increase in payroll taxes from 12.4 to 14.1 per cent, a decrease in current and future benefits by 11.5 per cent, or some combination of the two is necessary to fund Social Security over the next 75 years, with even bigger changes necessary to fund benefits indefinitely (Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Fund 2008). Delaying the implementation of these changes will necessitate larger increases in taxes or reduction in benefits as the paying for the increased cost is spread out over a shorter period of time.

In contrast to the U.S., action to maintain the Canada and Quebec pension plans over the long-term has already been taken. As a result the long-term sustainability of these programs is very promising. While raising the age of eligibility for benefits in Canada had been proposed (Hering and Klassen 2006; McMullin and Tomchick 2004), the Canadian government opted to increase contributions rather than increase the age of eligibility. The Canada and Quebec pension plans were originally established as pay-as-you-go systems with small reserves (enough to cover two years of expenditures in the case of the QPP). Recognizing the impact of funding pensions for the retiring baby boomers on the future workforce, the Canada Pension Plan revised its funding approach to be a hybrid of a pay-as-you-go and a full funding structure (Human Resources and Social Development Canada 2007). This 'steady state' financing, required that contributions be set no lower than the minimum necessary to ensure the long-term viability of the CPP, and contributions (which are split between employees and employers) were increased gradually from 5.6 per cent of pensionable earnings in 1996 to 9.9 per cent in 2003 where they will remain indefinitely (Human Resources and Social Development Canada 2007). In addition, a law was passed in 2007 requiring that any future changes to the CPP that increase or add benefits be fully funded (Chief Actuary of Canada 2007).

At the end of 2003, the revenue generated by the additional contributions enabled the assets of the fund to exceed liabilities by 12 per cent (up from 7 per cent in 1997) and projections indicate that by 2025 the assets of the fund will exceed liabilities by 25 per cent (Human Resources and Social Development Canada 2007). In 1997, the Canadian Government created the CPP Investment Board, which is separate from the CPP and operates at arms-length from the government, with oversight from an independent board of directors (Human Resources and Social Development Canada 2006a). The CPP Investment Board invests excess funds in fixed income securities, private equity, real estate and infrastructure and publicly traded stocks (Human Resources and Social Development Canada 2006a), further strengthening the reserve. Using the CPP reserve fund, the CPP Investment Board earned over 6 billion dollars in the fiscal year ending March 31, 2005 (Human Resources and Social Development Canada 2006a).

Even after the majority of baby boomers retire, the steady state financing will see assets of the CPP accrue at least as fast as liabilities. The most recent actuarial report for the plan, based on 2006 figures, concludes that the Canada Pension Plan is financially sound and that long-term projections indicate the ability to accommodate the impact of population aging and the resulting decrease in the ratio of workers to retirees (Chief Actuary of Canada 2007).

The Quebec Pension Plan also increased contributions to 9.9 per cent by 2003, at which time the reserve was 2.5 times the size of the expected expenditures for the following year (Regie des rentes du Quebec 2003). Similar to the CPP, the QPP has a board that invests the Fund's excess revenue to generate additional revenue. Despite increasing contributions to the same level as the CPP, the sustainability of the QPP is not as secure as the CPP. In addition to offering more generous benefits than the CPP (Regie des rentes du Quebec 2003), Quebec will experience population aging to a greater extent than the rest of Canada, resulting in more retirees receiving benefits relative to workers making contributions than in the rest of the country. By 2020 the QPP reserve fund is anticipated to increase to 3.9 times the expected expenditures for the following year; however, the reserve is expected to fall to 0.8 times the expected outflows by 2055, below the minimum level necessary to ensure 2 years of expenditures. So while current contribution levels are enough to sustain the plan to 2055, if adjustments are not made before this time contributions will need to increase to 12.5 per cent to cover all expenditures (Regie des rentes du Quebec 2003). These projections suggest future changes to the plan in terms of either benefits or contributions are necessary to guarantee its long-term sustainability. It should be noted that the Federal Government is not obligated to provide CPP benefits to residents of Quebec (Roberts 2003), although if the QPPD cuts benefits severely, older adults in Quebec will qualify for more OAS benefits, increasing federal expenditures.

Private Pensions and Personal Savings

In general, public sources of income in retirement are designed to guarantee a minimum income, replacing 25 per cent of pensionable pre-retirement earnings in

Canada (Statistics Canada 2003b) and 40 per cent of pre-retirement earnings for the average worker in the U.S. (Social Security Administration 2008). Private, employer-sponsored pensions are therefore an important source of retirement income, particularly for those in the middle to high-income range who need more income than is offered under public pension plans to maintain their standard of living. Private pensions generally take one of two forms, or some combination of the two: 1) defined benefit plans, in which pre-tax contributions are made to a pension fund by the employer and benefits, which are based on a percentage of final salary for each year of service, are paid to the employee upon retirement as a lifetime annuity; and 2) defined contribution plans, in which pre-tax contributions are made by both the employee and the employer to a retirement savings account, which is then invested to generate further income and upon retirement the employee can decide how and when to withdraw the funds (Munnell et al. 2002).

Approximately 52 per cent of retirees in the U.S. receive some sort of pension income (General Accounting Office 2002) and these participation rates appear to be fairly consistent over the past thirty years (Munnell et al. 2002), indicating future cohorts of retirees will be as likely to have pension income as those currently retired. Participation in private pensions in Canada is a little lower, with only one-third of the labor force in 2000 indicating coverage in an employer sponsored Retirement Pension Plan (Statistics Canada 2003b). While the rates of participation in private pension plans have remained relatively consistent over time, there is a definite shift in recent years towards defined contribution plans and away from defined benefit plans in both countries (Lusardi et al. 2003; Munnell et al. 2002).

Not everyone qualifies for a private pension and even some that do would like to save additional money for retirement. Registered Retirement Savings Plans (RRSPs) allow Canadians to deposit money into a tax-deferred personal retirement plan. Income from RRSP contributions is taxable and is a source of tax income for the government from older Canadians (Merette 2002). Individual Retirement Accounts (IRAs) in the U.S. are similar to RRSPs in that they allow contributions into a tax-deferred personal retirement plan; however, eligibility and payment rules and the calculation of maximum annual contributions vary between the two countries. The U.S. has recently introduced a

new IRA called the Roth IRA, which allows after tax contributions to grow tax-free as eligible withdrawals are not subject to income tax (Hrung 2004). In 1998, approximately 29 per cent of all Canadian tax filers contributed to an RRSP (Statistics Canada 2003b), while only 5.9 per cent of U.S. tax filers contributed to an IRA (3.1 per cent deductible IRA, 2.8 per cent Roth IRA) (Hrung 2004).

Individuals in the United States who contribute to private or personal retirement savings are more likely to be male, older, non-Hispanic white, married and high-income earners (Springstead and Wilson 2000). Thus certain populations appear at an increased risk of experiencing a reduction in their standard of living upon retirement.

Labor Force Participation and Productivity

The impact of an aging population on the size and composition of the workforce is of concern for a number of reasons. The size of the labor force has a direct influence on the capacity of an economy to produce goods and services (Purcell 2005). A shrinking workforce could therefore contribute to a decline in GDP and standards of living if productivity cannot rise fast enough to compensate for the decline in the number of workers (Peterson 1999). In addition, a smaller workforce means a smaller overall tax base for the generation of government revenue (Merette 2002). Both the Canadian and U.S. governments receive income from retired workers, since many forms of retirement income are taxable, however, retired workers tend to be in lower tax brackets and some retirement income may be exempt or taxed at a lower rate. Foot and Stoffman (1996) argue that the retirement of the baby boom cohorts need not lead to anxiety over a worker-shortage, as the large “echo” generation – the children of the baby boom cohorts – will reinforce the labor force and their numbers combined with the “baby bust” generation – the smaller cohorts born after the baby boom – outnumber the retiring boomers. Despite this argument, concerns remain in both Canada and the U.S. and policy makers are considering strategies to increase the size of the labor force.

Although labor force participation rates among women have risen remarkably over the past 30 years,

they are still below those of men. Encouraging further increases in female labor force participation is one strategy to increase the number of workers. These strategies could include family friendly policies such as paid maternity leave, day care and more flexible work schedules (Henripin 1994). However, increased labor force participation rates for women, especially middle-aged and older women, may have the unintended consequence of further limiting the availability of women to provide informal care to frail older adults and increase reliance on the formal sector to provide these services (Wiener and Tilly 2002).

Some strategies to increase labor force participation can be applied to all age groups, although most are directed towards older workers because of their relatively low labor force participation rates. Both Canada and the U.S. experienced a strong trend in the post World War II era towards earlier and earlier retirement. While there is evidence that this trend may have tapered off recently in Canada (Kieran 2001) and even begun to reverse itself in the U.S. (Purcell 2005), future retirement trends are not set in stone and can be influenced by the incentives embedded in current and future policy initiatives (Quinn 2002). Many observers have pointed out that certain elements of both private and public pensions and other government policies encourage early retirement and/or discourage work at older ages.

In Canada, individuals become eligible to receive CPP/QPP benefits anytime between the ages of 60 and 70, with benefits being permanently reduced by $\frac{1}{2}$ a per cent for each month before age 65 that the benefits are taken and an increase in monthly benefits of the same scale if they delay receipt of benefits past age 65 (Social Development Canada 2005). Similarly, in the U.S. individuals can take early retirement starting at age 62, which permanently reduces their monthly Social Security payment, or delay taking benefits when they reach full retirement age (until age 70) and permanently increase their monthly payments (Social Security Administration 2008). The idea behind these adjustments in both countries is to keep the net present value of the benefits paid the same regardless of the age at which the individual retires. However, research in both countries shows that when income from other government programs is considered, the net benefits are greater for those who retire at younger ages, which possibly encourages lower income workers to retire early (Baker and Benjamin 1999; Powers and Neumark 2005). Baker and Benjamin (1999) find that when the

Guaranteed Income Supplement is also considered the financial benefits of retiring early are even greater, particularly for low-income individuals. For individuals whose only income is from CPP/QPP, OAS and GIS, approximately half of the penalty to benefits resulting from early retirement is made up for by higher GIS benefits when the individual becomes eligible at age 65 (Baker and Benjamin 1999). Powers and Neumark (2005) find a similar relationship between SSI and Social Security benefits and calculate a net annual loss in income of 7 per cent when SSI recipients claim Social Security benefits at age 65 rather than age 62. In addition, subgroups of the population who have lower life expectancies benefit more from taking early retirement with lower payments because they anticipate collecting benefits for fewer years and the higher benefits obtained by waiting will not make up for the lost pension income from the years that benefits were delayed (Burtless and Quinn 2000).

One requirement for collecting CPP benefits between the ages of 60 and 64 is that one must either stop working the month before benefits begin and not be working the month benefits begin, or earn below a certain amount during this same time frame (Social Development Canada 2005). After benefits begin, people can return to work and earn as much as they want without affecting benefits, although they will no longer be allowed to make contributions to the CPP from their earnings. These policies limit the possibilities for flexible or phased retirement before age 65 and once older adults leave the labor force they may have a difficult time re-entering (McMullin and Tomchick 2004). Quebec has similar provisions for benefits before age 65 but allows a further option of reducing employment earnings by at least 20 per cent per pay period in accordance with an agreement with the employer to reduce work hours leading up to retirement (Regie des rentes du Quebec 2008). In the U.S., Social Security benefits for those below the normal age of retirement are subject to an earnings test that reduces monthly benefits in relation to the amount of employment income an individual receives over a specified amount (Burtless and Quinn 2000). This rule reduces the financial returns to working and may encourage older workers who collect Social Security benefits early to completely withdraw from the labor force, particularly low-income workers who could receive the same monthly income solely from Social Security as they would from working while receiving benefits.

Employer-sponsored pension plans, in particular defined benefit (DB) plans, are often structured in a way that discourages continued labor force participation at older ages. Workers in DB plans often see the value of their pension increase with years of employment up to a certain point, after which the returns to further work after a particular age can drop dramatically (Burtless and Quinn 2000). DB plans also discourage phased retirement in two ways. First, benefit amounts are often tied to the amount of earnings in the years prior to receiving a pension rather than the highest earning years. Reducing hours of work before retirement therefore reduces the value of the DB pension so potential retirees are more inclined to stop working completely. DB plans may also have an earnings test that reduces the amount of the monthly benefit if beneficiaries continue to receive income from the sponsoring employer. While employment earnings from a source other than the sponsoring employer do not affect benefits, older workers find it difficult to get jobs that pay as well once they leave their career jobs and may give up looking for a job and call themselves retired (Burtless and Quinn 2000; McMullin and Tomchick 2004). While there has been a definite shift away from DB pension plans towards more age-neutral DC plans in recent years, a large group of future retirees are still covered by DB plans and may be pushed in the direction of early retirement if these policies are not changed.

Other government policies such as mandatory retirement laws can also have an impact on age at retirement. In the U.S., mandatory retirement policies have been outlawed for the vast majority of workers (Burtless and Quinn 2000). In Canada however, under the Human Rights Act the termination of employment because an individual has reached the normal retirement age for that profession is not viewed as discriminatory (Human Resources and Social Development Canada 2006b). At the provincial level there is considerable variation in the legal provisions governing mandatory retirement, with some provinces and territories outlawing mandatory retirement policies at any age and others protecting older workers from age-based discrimination up to age 65 or in other specific situations. Banning mandatory retirement policies would prevent companies from forcing employees out of their jobs when they are still willing and able to work. Gunderson (2004) cautions however, that mandatory retirement should not be viewed as blanket

age discrimination but rather an important component of mutually agreed upon agreements entered into by groups with reasonable bargaining power. Removing this option from collective agreements could undermine the private contractual arrangements of various companies and their employees and have negative consequences for both parties.

These are just a few examples of the ways in which Canadian and American laws and policies fail to encourage or even accommodate older workers. Taking everything together, there is an implicit tax on work at older ages and as a result a diminished return on continuing to work (Butrica et al. 2006). Not only does this reduce the productive potential of the economy but it reduces the number of workers paying taxes while at the same time increasing the number of retired workers receiving benefits (Denton and Spencer 2000). Other suggestions for increasing labor force participation at older ages include targeting employment training programs to older displaced workers, raising the minimum age for public and private retirement benefits, providing more opportunities for phased retirement, providing tax incentives for employers to employ older workers and offering tax credits or a reduction in payroll taxes for older workers (Burtless and Quinn 2000; Butrica et al. 2006; McMullin and Tomchick 2004). Whatever policies are adopted in the future to increase labor force participation at older ages, careful consideration must be given to the unintended consequences of these policy changes.

Health Care

The relationship between the age structure of a nation's population and its per capita health spending is not clear-cut. Most studies fail to find a significant association between them when other variables are controlled (Gerdtham et al. 1992; Getzen 1992), although O'Connell (1996) found a significant relationship in some countries but not others. However, within nations, older individuals do have higher per capita health care costs and service utilization rates than younger individuals (Barer et al. 1995; Barer et al. 1994; Denton 2002). Thus, even in the absence of a strong relationship between population age structure and aggregate health care spending, both Canadians and Americans are concerned about the impact

of an aging population on the cost and availability of health services.

Financing and Cost

One of the most dramatic differences in social policy between Canada and the U.S. is in the financing of and entitlement to health care services. Canada has a publicly funded Universal Health Care System that covers medically necessary hospital and physician services for the entire population. The system is funded through federal and provincial corporate and individual income taxes, with some provinces receiving additional funds from sales taxes, payroll levies and lottery proceeds (National Coalition on Health Care 2008). Alberta and British Columbia charge a modest health insurance premium but services can not be denied if premiums have not been paid and in Alberta, premiums are waived for people over the age 65 (Barer et al. 1994). Originally, the Federal Government offered grants that covered half the cost of the provincial health care plans. However, over time the funding formulas were changed such that federal contributions were no longer related to the actual cost of the provincial health care programs and funding for health care was grouped with funding for other programs. This change means that the proportion of health care expenditures funded by the Federal Government has been steadily declining since 1977 (Roberts 2003). This funding structure protects the Federal Government from any potential age-related increases in health-care spending (Roberts 2003) but leaves the provincial governments at increased risk, as any increase in cost is not shared equally between the two levels of government. This is especially problematic given that provinces vary in their exposure to potential age-related increases in health-care spending and could result in a reduction of coverage for certain health-care services for older adults in the provinces hardest hit.

In the U.S., people over the age of 65 are entitled to Medicare, a public health care program that covers acute care needs. Medicare consists in multiple parts that are funded by different sources. Part A provides hospital insurance and is funded through payroll taxes on covered workers and employers, premiums from those who did not pay or did not have a spouse who paid Medicare taxes while working and taxes paid on Social Security Benefits. Part B provides supplemen-

tary medical insurance to cover outpatient care, which is financed from monthly premiums and general revenue transfers from the U.S. Treasury. Part C is an alternative to Parts A and B that allows a beneficiary to enroll in a private managed care plan that is paid for by Medicare but may also involve a monthly premium paid by recipients because of extra benefits that are offered. Finally, Part D provides prescription drug coverage and is financed by premiums, general federal revenues and state payments for individuals eligible for both Medicare and Medicaid (Centers for Medicare and Medicaid Services 2007; Hakkio and Wiseman 2006; Kaiser Family Foundation 2007).

Unlike the Canadian Health Care System, Medicare does not cover all medically necessary hospital and physician services and long-term care for chronic conditions and many services that are covered require co-payments and/or deductibles (Centers for Medicare and Medicaid Services 2008). As a result, the majority of older Americans end up purchasing additional supplementary health insurance if they can afford it (Chulis et al. 1993; Crystal et al. 2000). However, not all older Americans can afford this additional coverage. Even with the additional coverage, the average Medicare beneficiary spends 19 per cent of his or her annual income on out-of-pocket health care expenses; low income beneficiaries spend 31.5 per cent (Crystal et al. 2000). Low-income seniors may also qualify for Medicaid, which covers the out-of-pocket expenses associated with Medicare and provides access to additional acute and long-term care services (Centers for Medicare and Medicaid Services 2005). Medicaid is a state administered program designed to provide health care to specific groups of low-income individuals and is jointly funded by the Federal and State Governments (Wachino et al. 2005).

Aging populations have different implications under the Canadian and U.S. models for the provision and financing of health care services. Population aging will lead to a less dramatic increase in aggregate government spending on health care in Canada than in the U.S. Canada provides publicly funded health care to all its citizens, regardless of age and while the cost of providing health care to the elderly increases with population aging, the cost of providing care to younger Canadians decreases. The changing age structure of the population means that health care spending will be redistributed across age groups, which will absorb some but not all, of the increased costs associated

with an aging population. For example in the five year period between 1999 and 2004, the proportion of national health care spending on Canadians 65 and older increased by 1.7 per cent and spending on those aged 45–64 increased by 1.9 per cent, while spending on 15–44 year olds decreased by 2.5 per cent and spending on Canadians under age 15 decreased by 1 per cent (Canadian Institute for Health Information, 2006 calculated from Tables E.1.2 and E.1.7).

In contrast, Medicare expenditures in the U.S. are restricted to the older population, thus as the older population grows no relief will be provided from a decrease in health care expenditures for younger age groups. In addition, the prices paid for health services in the U.S. are higher than in other countries (Wiener and Tilly 2002), which translate into a more drastic increase in aggregate health care spending associated with population aging. As a result, population aging will have a significant impact on the cost of the Medicare program and there is justifiable concern over the program's ability to sustain a growing number of older people (Porterba and Summers 1987; Roberts 2003). An aging population will also affect Medicaid expenditures, because poor elderly people rely on a combination of Medicare and Medicaid to finance their health care needs (Chulis et al. 1993; Crystal et al. 2000). Efforts to reform Medicare and Medicaid are difficult as these federal programs are susceptible to powerful lobby groups (Roberts 2003).

In Canada, the increase in the aggregate cost of physician services due to population change is projected to be the same between 2000 and 2010 as it was between 1990 and 2000 and to be lower in subsequent decades (Denton et al. 2002). The reason for this is that population growth is the main component of population-based increases in aggregate spending on health care and the anticipated slowing of population growth will compensate for increased per capita spending due to population aging. Furthermore, the impact of an aging population on health care expenditures will occur over time. While the cumulative impact over a long period can be substantial, the gradual process allows time for the government to respond (Barer et al. 1995). Providing Canada's GDP increases at the same rate it did between 1990 and 2000, or at least remains on par with other historically observed increases, increases in the cost of health care associated with population change (both size and age composition) should be manageable (Barer et al. 1995; Denton et al. 2002). Henripin (1994),

however, has some reservations about this assumption, arguing that increases in general productivity could translate into higher wages for all; thus unless the increases in productivity occur in the health care sector specifically, these higher wages will translate into higher health care costs. In addition, these projections only cover increases in cost associated with population change and do not account for other factors that affect aggregate health care spending, such as the rising cost of health care services.

Studies in Canada, the U.S. and other developed countries agree that aggregate health care spending will increase in the future but that population aging will not be the driving force (Barer et al. 1995; Evans et al. 2001; Reinhardt 2003). Factors such as population growth, rising per capita income, changes in health care utilization patterns and advances in medical technology (including the development of new and more expensive pharmaceuticals) appear to play a more pivotal role in driving overall future health care demands and costs (Barer et al. 1995; Denton et al. 2003; Evans et al. 2001; Reinhardt 2003; Strunk et al. 2006). This evidence does not mean that the future cost of health care should not be a concern. However, the evidence allows attention to be directed to the real causes of these increases and should give pause to those who want to point the finger at population aging in order to distract attention from the real issues.

The presence of older adults in hospitals, physician's offices and at the pharmacy counter has increased dramatically over the past few decades but this increase in health care utilization by the elderly has little to do with population aging. The principal cause is that the health care system is doing more for older adults than it has in the past (Barer et al. 1995; Getzen 1992). In fact, age-specific medical utilization rates have been increasing across all age groups but the increases are most striking amongst the oldest-old (Barer et al. 1989). Surgical procedures are being performed on adults over the age of 65 more frequently than in the past (Anderson et al. 1990; Riley and Kanigan 1989) and specialist consultations have increased among older adults in self-reported good health as well as poor health (Black et al. 1995). A study of pharmaceutical utilization among older adults in British Columbia over 7 years in the 1980s found that approximately 33 per cent of the observed increase in utilization could be attributed to new products, just under 25 per cent

was due to increased age-specific utilization rates and 20 per cent was due to increased prices for previously available products (Anderson et al. 1993).

The degree to which increases in elderly health care utilization reflect increased need, previously unmet need, or the provision of inappropriate services is unclear. What is clear is that a central issue for health care policy and management should be the appropriate care of older adults (Barer et al. 1995). Soaring medical costs are a challenge that the governments of Canada and the U.S. need to address, even if the root cause of the problem cannot be attributed to aging populations. The fact that demographic change is not the cause of the problem should provide some sense of relief, as the real causes are within government's power to control, even if they do involve making tough decisions about social priorities (Barer et al. 1995). Implementing policy changes to contain medical costs may be more difficult in the U.S. than in Canada. The free-market nature of the American system makes it more difficult to contain health care costs than in Canada, where the government determines reimbursement rates for services and regulates the cost of pharmaceuticals for the general population and the administrative costs associated with health care delivery are much lower (Barer et al. 1994; Danzon 2000; Hollis 2004). The proliferation of costly medical technology on a per capita basis is also more extensive in the U.S. than in Canada (Ruble 1994). All of these factors contribute to greater increases in health care costs over time in the U.S. compared to Canada. In addition, powerful corporate interests in the U.S. make it difficult for the government to take direct action to reduce the escalation of health care costs (Quadagno 2004).

As a result of differences in the funding structure of health care for older adults in Canada and the U.S., the burden of future costs in Canada will be borne mainly by the Provincial Governments and to a lesser extent the Federal Government, while in the U.S. the burden will be borne by both the State and Federal Governments and in addition affect the financial security of individual older adults. Rhetoric about the catastrophic consequences of the aging baby boomers for the Canadian Health Care system continues to thrive despite numerous empirical studies providing evidence to the contrary (Evans et al. 2001) and is being used to promote changes in the health care system that are not consistent with the

views of the majority of Canadians (McDaniel and Chappell 1999). Similar concerns are expressed in the U.S. regarding the impact of aging baby boomers on Medicare spending (Porterba and Summers 1987; Roberts 2003) and although there is some truth behind these concerns, the role of population aging in increasing health care expenditures has been exaggerated. If medical costs can be contained, increases in the older population can be accommodated by the current Medicare system without radical restructuring (Marmor and Oberlander 1998). In an effort to control the impact of rising health care costs on the federal budget, recent proposals in the U.S. include provisions to shift more of the costs of Medicaid to individual states and suggest that federal funding of this program may be restructured to cap federal spending on at least parts of the program (Wachino et al. 2005). While these changes may shelter the Federal Government from uncontrolled increases in health care costs, they make the individual states more vulnerable and do not address the underlying problem of escalating health care costs and Americans' inability to pay them.

Service Delivery

Concerns have been raised in both nations about the impact of population aging on the demand for health services and the capacity to meet these needs. Research suggests that increases in the demand for doctors and hospital services will reflect population growth, not population aging. A study of the supply of doctors in Canada showed that even with the aging of the baby boomers, the majority of the increase in the demand for doctors will be a result of population growth, not population aging and that the anticipated slowdown of population growth will more than compensate for the increase in demand from an older population (Denton et al. 2003). A similar type of study examining the demand for inpatient hospital services in the U.S. projected an increase in demand of about 0.74 per cent per year as a result of population aging and an increase of 0.9 per cent per year as a result of population growth (Strunk et al. 2006). This research suggests that the increase in demand for doctors and hospital beds that result from population aging will be manageable. The aging of the nursing workforce paints a bleaker picture however, as the nursing profession is not attracting as

many younger workers as in the past and there is growing concern about the ability to meet the demand for registered nurses in Canada and the U.S. as older nurses retire and there is no one to replace them (Buerhaus et al. 2000; Spurgeon 2000).

In addition to affecting the level of demand for health services, population aging will have a substantial effect on the types of medical services and specialties in demand and even the ways in which medicine is practiced. The extent to which these needs will be met is unclear. Thus, for example, a study projecting only modest increases in hospital days due to changing service utilization and population aging notes that the more significant change will be in the age distribution of hospital patients, which in turn will have far reaching effects on the types of services required and which may require additional training for medical practitioners and other hospital staff (Carriere 2000). The changing age structure of the Canadian and American populations will increase the demand for specialties such as ophthalmology and thoracic/cardiovascular surgery, while the demand for pediatric, obstetrics/gynecology and mental health services will grow at a much slower rate or even decline (Denton et al. 2002; Strunk et al. 2006). The extent to which the Canadian and American medical associations and schools are preparing for these transitions is unclear and a lack of forethought could pose significant problems in the future. In addition, Wiener and Tilly (2002) anticipate that “the style of medicine will have to change from one-time interventions that correct a single problem to the ongoing management of multiple diseases and disabilities; doctors and patients will have to have an ongoing relationship designed to help patients cope with illnesses rather than curing them” (p. 776). The current system of care for the majority of elderly patients has been criticized as being too fragmented, resulting in the overuse of acute care hospitals and long-term care institutions when community-based care would be more desirable and appropriate (Bergman et al. 1997).

Long-Term Care

Although Canadians and Americans are living longer, healthier lives, many older people will require long-term care services at some point. Long-term

care services include both medical and non-medical care for individuals with a chronic illness or disability. In both nations, family and friends provide the majority of this care but people who can afford them or who have some form of long-term care insurance also use paid long-term care services (National Advisory Council on Aging 1999; National Alliance for Caregiving 2005). Paid long-term care services can be provided in a number of settings, including nursing homes, assisted living facilities and other forms of congregate housing, adult day care and in the home through the use of home health workers (Stone and Wiener 2001).

The growing size of the elderly population, particularly the oldest-old (persons 85 and older), will result in an increased need for long-term care services. The U.S. and Canada have radically different philosophies regarding long-term care. Both countries rely heavily on the informal support of friends and family; however, formal long-term care in Canada is primarily the responsibility of the government, while in the U.S. the individual bears this responsibility with the government playing a role only when the individual has exhausted all possible resources (Kane and Kane 1994). Despite these different approaches, the cost of long-term care and how it will be provided and paid for is a concern shared by Canadians and Americans.

In Canada, there are no federal requirements for the provision of long-term care services, leaving the provinces in charge of determining the types of long-term care services covered (Di Matteo and Di Matteo 2001). While all provinces cover various amounts of home health care, two provinces do not provide universal institutional long-term care coverage and instead finance nursing home care in a manner similar to the U.S. (Kane and Kane 1994). As a result, the type and amount of publicly funded long-term care services available to Canadians varies considerably depending on where they live. This raises concerns about inequalities in access to long-term care services, treatment appropriateness, informal caregiver burden and out-of-pocket versus government formal care costs across provinces (Coyte 2000).

Long-term care in the U.S. is supported through a patchwork of private and public sources. Except for home care or short-term nursing home placement related to an acute illness, Medicare and most private insurance plans do not cover long-term care services. Very few older adults have purchased long-term care insurance (Wiener and Stevenson 1998). Thus, most

frail U.S. seniors rely on informal care supplemented by formal care services paid for out-of-pocket (Congressional Budget Office 2004). Older adults who have not adequately prepared to finance their long-term care needs eventually spend down their assets and income to the point where they qualify for Medicaid or other state-funded programs (Wiener and Stevenson 1998). The high cost of long-term care, particularly nursing home placement, often means that even those who initially have the financial resources to contribute to the cost of their long-term care may eventually require public assistance. Some providers of long-term care services will not accept Medicaid clients because of its many regulations or low reimbursement rates, leaving older adults who rely on Medicaid with fewer options with which to meet their care needs (Kane and Kane 1994). This raises concerns about the quality of long-term care provided to Medicaid beneficiaries compared to those who can afford to tap into the private care market.

As government expenditures for long-term care services grow, program changes that limit eligibility and restrict the types of services available are being used to cut costs (Wiener and Stevenson 1998). However, limiting access to publicly funded long-term care will not reduce the need for it among those who cannot afford to purchase it privately. Efforts at cost containment thus jeopardize the well-being of the elderly and may burden the family members who step in to provide care. Some argue that shrinking the social safety net for long-term care will force Americans to purchase private long-term care insurance or to increase their savings (Congressional Budget Office 2004). While these options may prevent wealthier Americans from eventually relying on public programs to fund their long-term care, they are not viable for those who have more meager incomes.

The deinstitutionalization of long-term care in Canada and the U.S. is shifting even more care for the frail elderly away from institutions and back into the home and community (Rosenthal 1994) and whether families will be able to meet these needs is unclear. Increased labor force participation of women, rising divorce rates and declining family size limit the availability of informal caregivers (Johnson et al. 2007; National Advisory Council on Aging 1999; National Alliance for Caregiving 2005) and their ability to maintain, let alone increase, levels of care to the elderly (Cheal 2000). Caregivers may experience high personal costs, which

may also limit their ability to provide care. If families will be relied on to provide care to frail elderly, these barriers and costs need to be recognized and policies developed to support and sustain caregivers. In particular, initiatives will be needed to facilitate the combination of work and family caregiving responsibilities (Rosenthal 1994).

Even with additional supports to help informal caregivers, over time informal care received by the frail elderly is projected to decline and a reliance on paid services to increase (Johnson et al. 2007). Unfortunately, the supply of formal long-term care workers is also an issue. Even without the increased demand from an aging population, the long-term care workforce is in crisis (Stone and Wiener 2001). The front-line long-term care workforce consists of various types of paraprofessionals: nursing assistants, home health and home care aides, personal care workers and personal care attendants (Stone and Wiener 2001). Long-term care workers are in short supply due to the heavy demands of the job, coupled with low wages and benefits and little societal appreciation for the work that they do (Wiener and Tilly 2002).

There has been a focus by health care financiers in Canada and the U.S. on increasing the paid long-term care services available in the community and in the home. However, this may mean that there will not be enough beds in nursing homes or skilled nursing facilities to meet future needs (Rosenthal 1994). While the development of alternatives in the delivery of long-term care services allows more individuals to avoid nursing home placement, there will always be a segment of the population that needs the 24-hour nursing care provided by a nursing home. Residents of long-term care facilities tend to be among the oldest-old (above age 85) with high disability rates, incontinence and/or cognitive impairment (Barer et al. 1995; Sahyoun et al. 2001). The high care needs of these individuals are difficult to meet in the community or at home. The oldest-old may also have a more limited supply of informal caregivers than the young old, as potential caregivers such as spouses and adult children may have died or require care themselves. Because of the growth in the oldest-old population, even if the proportion of elderly requiring nursing home placement over the next thirty years fell by one-third, the number of beds in traditional long-term care facilities would need to increase to meet demand (Sahyoun et al. 2001).

Overall Government Spending

A major concern surrounding population aging is how the demands of supporting growing older populations will be balanced by the resources derived from shrinking working-age populations (Denton and Spencer 2000). This concern is founded on the assumption that certain segments of the population (i.e., older adults) are dependent on other segments of the population (i.e., working age adults) to meet their needs. This assumption is often quantified in dependency ratios, which are calculated as the ratio of individuals in a population who are considered dependent (ages 0–15, 18 or 20 depending on the source and those aged 65 and older) to those considered labor force age (Gee 2002).

The old-age or elderly dependency ratio, which is the ratio of the population aged 65 and older to the population considered labor force age, has gained considerable attention from ‘apocalyptic’ commentators on population aging. Indeed, old-age dependency ratios do present a grim picture when examined in

isolation. Table 10.6 shows observed and projected old-age dependency ratios for the U.S. and Canada. In 1870, the U.S. old-age dependency ratio was 0.05, in 2000 it was 0.19 and it is projected to be 0.35 in 2050. Canada shows a similar pattern with observed old-age dependency ratios of 0.07 in 1871 and 0.18 in 2001 and a projected ratio of 0.44 in 2051. Although the projected ratios may seem high, note that even after the majority of the baby boom cohorts reach age 65 (in 2030), old-age dependency ratios in the U.S. and Canada are projected to be lower than in Europe and Japan (Denton and Spencer 2000).

However, dependency ratios, especially the old-age dependency ratio, may be a misleading guide to the impact of aging populations. First, the old-age dependency ratio assumes that all members of society who are working age are productive and all members who are elderly are dependent, ignoring unemployment among working age adults and employment among older adults (Gee 2002; McDaniel 1986). The old-age dependency ratio also fails to consider the

Table 10.6 Observed and projected dependency ratios: the United States and Canada

United States				Canada			
Year	Old age	Young age	Total	Year	Old age	Young age	Total
1870	0.05	0.68	0.73	1871	0.07	0.76	0.83
1880	0.06	0.65	0.71	1881	0.07	0.68	0.75
1890	0.06	0.58	0.65	1891	0.08	0.60	0.67
1900	0.07	0.56	0.63	1901	0.08	0.57	0.65
1910	0.07	0.50	0.57	1911	0.07	0.53	0.60
1920	0.07	0.50	0.58	1921	0.08	0.57	0.64
1930	0.08	0.47	0.56	1931	0.09	0.50	0.59
1940	0.10	0.35	0.45	1941	0.10	0.42	0.53
1950	0.12	0.41	0.54	1951	0.13	0.49	0.62
1960	0.15	0.52	0.68	1961	0.13	0.58	0.71
1970	0.16	0.46	0.62	1971	0.13	0.47	0.60
1980	0.17	0.34	0.51	1981	0.14	0.33	0.47
1990	0.19	0.33	0.52	1991	0.17	0.31	0.47
2000	0.19	0.32	0.51	2001	0.18	0.28	0.46
2010	0.19	0.28	0.47	2011	0.21	0.23	0.44
2020	0.26	0.31	0.57	2021	0.28	0.23	0.51
2030	0.33	0.33	0.65	2031	0.38	0.24	0.61
2040	0.34	0.33	0.67	2041	0.41	0.23	0.64
2050	0.35	0.33	0.68	2051	0.44	0.23	0.67

Source: Authors' calculations from data in Tables 10.1–10.4.

value of unpaid labor (Gee 2000); many older adults are actively engaged in volunteer work and informal caregiving. Second, trends in the old-age dependency ratio do not incorporate changes in dependency levels in the early part of the life course, so they do not provide a complete picture of changes in population-level dependence. At the same time that the proportion of the population in the oldest-age groups is increasing in Canada and the U.S., the proportion in the youngest age groups is decreasing. This trend can be observed in Tables 10.1–10.4. The net effect of these offsetting trends on dependency ratios can also be seen in Table 10.6; the increase in the total dependency ratio over time is not as alarming as a sole focus on old-age dependency suggests. In fact between 1990 and 2010, the working-age population in the U.S. was growing faster than the dependent population, leading to a *decline* in dependency ratios (Cutler et al. 1990). Projected total dependency ratios that take into account the impact of the baby boom cohort turning 65 are similar to and in most cases even lower than those observed in Canada and the U.S. in the 1960s during the height of the baby boom (Denton and Spencer 2000; Little and Triest 2002). The only difference is that the majority of dependents now and in the foreseeable future are elderly rather than young.

These findings indicate that in Canada and the U.S. the increased social burden triggered by changing age structure is likely manageable, as similar levels of dependency have been experienced in the past. Governments will simply need to shift resources that will no longer be needed by a shrinking younger population to a growing older population. However, the total dependency ratio also suffers from some implicit assumptions, some of which weaken this argument. Most important, the total dependency ratio does not distinguish between the young and elderly dependent populations and therefore assumes that a dependent young person and a dependent older person will have the same social impact. However, the argument can be made that children have lower resource consumption needs than the elderly and moreover, that most financial transfers to children occur within the family, while those to the elderly are more likely to involve the government (Cutler et al. 1990; Foot 1989; Gee 2002). In this case a total dependency ratio weighted to account for the higher social burden of the elderly relative to the young would be more appropriate. Research using weighted measures of total dependency shows more

dramatic increases in overall dependency (Foot 1989; Little and Triest 2002). However, simulations for the Canadian population by Denton et al. (1998) using a variety of age-based weights found that for weighted dependency ratios to exceed those observed when the baby boomers were in their youth, the per capita cost of the elderly would have to be three times the per capita cost of dependents in their youth, a scenario the researchers concluded was unlikely.

The rhetoric of an aging population crisis tends to focus only on the areas where government expenditures will increase as a result of increases in the proportion of the population that is elderly. As we have reviewed, in both nations government spending in certain areas will have to increase in order to maintain publicly funded benefits at the levels that today's seniors enjoy. However, this narrow view of the consequences of a changing age structure misses the bigger picture and overestimates the net costs of population aging because it fails to consider that, while expenditures for the oldest segment of society will increase, expenditures for the youngest and middle age groups will decrease. These decreases will to some extent counterbalance the increases associated with the elderly (Denton and Spencer 2000). Henripin (1994) however, is less optimistic about the degree to which the reduction in expenditures on younger age groups will compensate for the large increases in public health costs and pension benefits for older adults.

Reductions in expenditures for the youngest and middle age groups will not result from robbing resources from the young to care for the old. Instead, these reductions reflect the fact that these age groups represent a smaller proportion of the population than previously and will therefore claim a smaller proportion of government budgets, even while per capita spending for these age groups is maintained. Areas of government expenditure that will likely see relative decreases as a result of smaller proportions of young and middle-age groups include education, employment programs (e.g., unemployment insurance and worker's compensation) and correctional services (Denton and Spencer 2000). This is truer for Canada than the U.S., as Canada currently has a lower fertility rate than the U.S. and has more social spending geared towards younger age groups, such as family allowances, child tax credits and child-care subsidies. Even so, based on empirical studies to date, the real issue for both governments does not appear to be how to deal

with a demand for a larger overall budget but how to rearrange money across various types of expenditures in relation to increased demand in some areas and a reduction in others (Denton and Spencer 2000). To the extent that this is not the case, Canadians and Americans will have to make some important decisions regarding how much they value the support provided to older adults and how much they are willing to pay as a society to maintain it.

Why is Population Aging Perceived as a Crisis?

In this chapter, we have reviewed a number of issues related to population aging and their potential consequences for the future. Despite empirical support about the manageability of these consequences and evidence that where problems are imminent, population aging is not to blame, the crisis rhetoric continues to prevail. It seems worthwhile to ask why the perception of an aging crisis is so widespread in both Canada and the U.S.

The public perception of a population aging crisis is largely fueled by the media, which tends to use dramatic and inflammatory language to characterize population aging as a current and/or impending crisis (Northcott 1994). This crisis framework is often manifested in discussions of intergenerational equity. The intergenerational equity debate surfaced at least a decade earlier in the U.S. (1980s) than in Canada (1990s) (Foot and Venne 2005), possibly because of the age-based criteria in the U.S. for large programs such as Medicare and greater opportunities for lobbying by special interest groups (Cook et al. 1994).

The portrayal of population aging in the media as an unchangeable and inescapable force with drastic negative consequences has imbued it with power and meaning and left the public and policy makers largely immune to contrary evidence (McDaniel 2003). According to the political economy perspective on aging, the characterization of population aging as a crisis is being promoted by governments for two reasons: "First, it focuses attention on a simple, visible 'cause,' i.e., population aging and deflects attention away from the other significant causes which may be more threatening politically. Second, it is argued that blaming the population aging trend justifies and legiti-

mates sacrifices to be borne by the public generally and by seniors in particular." (Northcott 1994: 68).

A study by Northcott (1994) found that the idea of a population aging crisis was widely accepted amongst Canadians living in Edmonton, Alberta and that this acceptance cut across socio-demographic and socio-economic groups. Furthermore, acceptance of the crisis scenario was related to personal willingness to accept tax increases and reduce old-age security benefits for higher income seniors. An additional finding of this study was that over 80 per cent of respondents were unwilling to endorse an across-the-board reduction in benefits for seniors, despite the concern by the majority of respondents (77 per cent) that Canada will have problems in supporting its elderly citizens in the future.

How old age is defined and categorized into particular age groups is important to any discussion of population aging (Denton and Spencer 2002). One of the reasons that aging populations are seen as a crisis is because old age is usually associated with declining health, dependence and the inability to work (Posner 1995). Population aging is often quantified by examining the changing proportion of the population over the age of 65; however, this approach loses sight of the fact that the association between this age group and old age is a social and historical construction (Elder 1975). Age 65 is associated with retirement and old age because it is the age at which individuals qualify for full pension benefits and Old Age Security in Canada and, until recently, Social Security benefits in the U.S. Earlier cohorts of older adults who reached retirement age were more likely to be in poor health, dependent and unable to work than current and future cohorts as they reach age 65. Essentially, the average 65-year-old 50 years ago was "older" than the average 65-year-old is today. With the age at which one typically becomes 'old' increasing over time the proportion of 'old people' in the population at any point in time can remain constant, even when the underlying age structure of the population is changing (Mullan 2000). While old age cannot be eliminated, we have certainly delayed it (Posner 1995). As people live longer disability free lives after turning 65, this demarcation of becoming old at age 65 has become outdated and lost its original meaning. Despite this fact, we still cling to this age marker as a representation of who is old and therefore in poor health, dependent and unable to work.

Given the substantial gains in active life expectancy it has been suggested that the age marker for old age, currently set at 65, be moved to an older age. While any age marker could be viewed as just as arbitrary, it is clear that continuing to use age 65 to represent old age exaggerates the future increase in the 'older population' (Denton et al. 2002; Denton and Spencer 2002). Even though adjusting the old age marker upward would reduce the number of people classified as old, it will not eliminate population aging (Denton and Spencer 2002). By adjusting this age marker to reflect real changes in the observed characteristics and circumstances of older adults we will have an age based indicator of old age that more accurately represents what we mean when we say old and is therefore more meaningful. Gains in active life expectancy have yet to plateau, so it is important to recognize that any static age markers that may seem appropriate today, may not be suitable in the future (Denton and Spencer 2002).

Despite the considerable variability in later life with regard to health, dependence and work patterns, it is unlikely that we will be able to escape our reliance on age markers to represent old age. As Denton and Spencer (2002) point out, age markers can be used as rough indicators of "need" for health care and other publicly funded services because in comparison to other age groups older adults have relatively similar lifestyles and social needs (Neugarten 1975). In addition, many of the public programs from which older adults can benefit use age-based criteria for qualification. This offers administrative simplicity over alternative qualification criteria that might be a more accurate measure of need but can also be viewed as invasive and demeaning (Denton and Spencer 2002). In general, the ways in which Canada and the U.S. use age and age-related categories as criteria for social policies and programs in the future will influence the impact of population aging (Cheal 2000).

The focus of population aging tends to revolve around the potential negative impact on society. However, a growing number of older people can also have a positive impact that is often overlooked. Future generations of older adults will be wealthier and healthier than previous generations and as a result have more disposable income and time available to contribute to the well-being of others. Much of the discourse on the impact of an aging population on the family has centered around the potential burden placed on families to care for their older relatives. This is

unfortunate because there is more to family life than caregiving and there has been little research on other ways in which population aging has impacted the family (Rosenthal 2000). Increases in life expectancy over the past century have resulted in a greater likelihood of families containing elderly members and more opportunities for relationships to continue as multiple generations co-exist for extended periods of time (Gee 1990; Uhlenberg 1996). In general, older adults give more emotional, financial and instrumental support to younger generations than they receive until fairly advanced ages (Morgan et al. 1991). In conjunction with population aging we will also see a greater opportunity for the development and maintenance of healthy intergenerational relationships that have the potential to greatly enrich the lives of young people, as well as old.

The positive influence of older adults on society extends beyond their impact within families. The amount of time spent volunteering by older people, as well as their larger financial contributions to charities relative to younger age groups are two such areas (Cheal 2000). Both formal and informal volunteer work performed by older adults provides considerable cost savings for individuals or organizations that would otherwise have to pay someone to perform those roles (Johnson and Schaner 2005). In the absence of volunteers or the funds to pay workers, many individual and organizational needs would go unmet with potentially disastrous consequences. Volunteering has also been shown to be beneficial for the physical and mental health of older adults (Lum and Lightfoot 2005). Given the benefits for both society and older adults, volunteering and other forms of civic engagement are being promoted as a strategy for healthy, successful and productive aging (Cullinane 2006/2007). However, careful attention should be paid to the potential negative consequences of framing successful aging in this way for older adults who can not, or choose not, to become civically engaged (Martinson 2006/2007).

The changing age structure of the population will also provide opportunities and developments that can positively influence society through market forces. Merette (2002) reminds us that market economies are highly adaptive and the scarcity of workers that will occur as the baby boomers retire will likely inspire labor saving technological advances. In addition, we can expect greater investments in human capital resulting in an increase in productivity and consequently

higher economic growth and standards of living. Businesses and even individuals can profit from the changing composition of the population and attention is now being given to the spending potential and needs of older consumers (Prince 2000). Some view the forthcoming retirement of the baby boomers with dollar signs in their eyes, as can be illustrated in the title of the best selling book by Foot and Stoffman (1996) *Boom, Bust, and Echo – How to Profit from the Coming Demographic Shift*. An aging population will likely see an increase in demand for products and services in a wide range of areas including but not limited to, home products, health care, wellness and youth-enhancing products, recreation and leisure services, financial services and products and business consulting (Doka 1992). Not only will this mean handsome profits for some, the innovative development and tailoring of products and services to meet the needs of an older population will also increase the well-being and life-satisfaction of older consumers.

An additional positive consequence of population aging that is often overlooked has to do with the potential impact of the changing age structure in Canada and the U.S. on crime and victimization. If current age-specific crime and victimization rates hold in the future, both countries should experience an overall reduction in the amount of crime and victimization in the future as a result of population aging (Carrington 2001; Levitt 1999). Even if other characteristics of the population change in ways that would lead to an increase in overall crime, the changing age-structure of the population will offset these changes to some extent and we will experience lower aggregate crime rates than if the population were not aging.

Conclusions

Population aging in the U.S. and Canada is not merely a result of each nation's aging baby boom cohort. Because of the demographic transition, the nations' populations have been aging for the past two centuries; this process would have led to older populations regardless of the baby boomers. Geographic variation in the distribution of older adults in Canada and the United States means that some areas will be impacted to a greater degree than others. While an aging population poses many challenges for both countries, the evidence suggests that

these challenges can be overcome without reductions in the standard of living for older adults or younger generations. It is important to remember that other developed countries are already experiencing population aging to a much greater extent than is projected for Canada and the United States and lessons can be learned from these countries on effective strategies for managing the consequences of population aging.

Instead of viewing population aging as a crisis, we suggest viewing it as an opportunity for change. However, care should be taken in how population aging is used as a motivation for change and close attention should be paid to the indirect consequences of any proposed changes. Appropriate data should be collected to monitor and be responsive to the complex issues that emerge from aging populations, particularly in the areas of health and income (Cheal 2000). This involves not only looking more closely at older adults but at decisions and experiences earlier in the life course that set the stage for the opportunities and constraints experienced later in life.

Acknowledgement The authors thank David Ekerdt for helpful comments on an earlier draft.

References

- Alzheimer Society of Ontario (2007) Projected prevalence of dementia: Ontario's local health integration networks. Retrieved January 25, 2009, from <http://alzheimerontario.org/local/files/Web%20site/Public%20Policy/Projected-Prevalence-of-Dementia-LHINS-April-2007.pdf>
- Anderson GF, Kerluke KJ, Pulcins IR, Hertzman C, Barer ML (1993) Trends and determinants of prescription drug expenditures in the elderly: Data from the British Columbia Pharmacare program. *Inquiry* 30:199–207
- Anderson GF, Pulcins IR, Barer ML, Evans RG, Hertzman C (1990) Acute care hospital utilization under Canadian National Health Insurance: The British Columbia experience from 1969–1988. *Inquiry* 27:352–358
- Applebaum R, Payne M (2005) How supplemental security income works. *Generations* 29(1):27–29
- Baker M, Benjamin D (1999) Early retirement provisions and the labor force behavior of older men: Evidence from Canada. *J Lab Econ* 17(4, pt 1):724
- Barer ML, Evans RG, Hertzman C (1995) Avalanche or glacier?: Health care and the demographic rhetoric. *Can J Aging/La Revue Canadienne du Vieillessement* 14(2):193–224
- Barer ML, Hertzman C, Miller R, Pascali MV (1994) On being old and sick: The burden of health care for the elderly in Canada and the United States. In: Marmor TR, Smeeding TM, Greene VL (eds) *Economic security and intergenera-*

- tional justice: A look at North America, The Urban Institute Press, Washington, DC, pp 263–286
- Barer ML, Pulcins IR, Evans RG, Hertzman C, Lomas J, Anderson GF (1989) Trends in use of medical services by the elderly in British Columbia. *Can Med Ass J* 141:39–45
- Bell F, Miller ML (2005) Life tables for the United States Social Security Area 1900–2100. Social Security Administration, Washington DC
- Bergman H, Beland F, Lebel P, Contandriopoulos AP, Tousignant P, Brunelle Y et al (1997) Care for Canada's frail elderly population: Fragmentation or integration? *Can Med Assoc J* 157(8):1116–1121
- Black C, Roos NP, Havens B, MacWilliam L (1995) Rising use of physician services by the elderly: The contribution of morbidity. *Can J Aging/La Revue Canadienne du Vieillissement* 14(2):225–244
- Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Fund (1991) 1991 Annual report of trustees of the federal old-age and survivors insurance and disability insurance trust funds. Retrieved April 27, 2008, from <http://www.ssa.gov/history/pdf/1991.pdf>
- Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Fund (2008) The 2008 Annual report of the board of trustees of the federal old-age and survivors insurance and federal disability insurance trust fund. Retrieved April 27, 2008, from <http://www.ssa.gov/OACT/TR/TR08/tr08.pdf>
- Brookmeyer R, Gray S, Kawas C (1998) Projections of Alzheimer's disease in the United States and the public health impact of delaying disease onset. *Am J Public Health* 88(9):1337–1342
- Buerhaus PI, Staiger DO, Auerbach DI (2000) Implications of an aging registered nurse workforce. *J Am Med Assoc* 283(22):2948–2945
- Burtless G, Quinn JF (2000) Retirement trends and policies to encourage work among older Americans. Working Papers in Economics Retrieved March 26, 2008, from escholarship.bc.edu/econ_papers/175
- Butrica BA, Johnson RW, Smith KE, Steuerle CE (2006) The implicit tax on work at older ages. *Natl Tax J, LVIV*(2):211–234
- Canadian Institute for Health Information (2006) National health expenditure trends 1975–2006. CIHI, Ottawa
- Carriere Y (2000) The impact of population aging and hospital days: Will there be a problem? In: Gee EM, Gutman GM (eds) *The overselling of population aging: Apocalyptic demography, intergenerational challenges, and social policy*, Oxford University Press, Don Mills, ON, pp 26–44
- Carrington PJ (2001) Population aging and crime in Canada, 2000–2041. *Can J Criminol/Revue Canadienne de Criminologie* 43, 331–356
- Casper LM, Bianchi SM (2002) *Continuity and change in the American family*. Sage Publications, Thousand Oaks, CA
- Centers for Medicare and Medicaid Services (2005) *Medicaid at-a-glance 2005: A Medicaid information source*. Retrieved March 27, 2008, from <http://www.cms.hhs.gov/MedicaidGenInfo/Downloads/MedicaidAtAGlance2005.pdf>
- Centers for Medicare and Medicaid Services (2007) *Medicare*. Retrieved March 27, 2008, from www.ssa.gov/pubs/10043.pdf
- Centers for Medicare and Medicaid Services (2008) *Medicare and you 2008*. Retrieved March 27, 2008, from www.medicare.gov/Publications/Pubs/pdf/10050.pdf
- Charbonneau H, Desjardins B, Legare J, Denis H (2000) The population of the St. Lawrence Valley, 1608–1760. In: Haines MR, Steckel RH (eds), *A population history of North America*, Cambridge University Press, Cambridge, pp 99–142
- Cheal D (2000) Aging and demographic change. *Canadian Public Policy - Analyse de Politiques* 26(Supplement: The Trends):S109–S122
- Chief Actuary of Canada (2003) 7th actuarial report on the old age security program. Office of the Superintendent of Financial Institutions, Ottawa, ON
- Chief Actuary of Canada (2007) 23rd actuarial report on the Canada Pension Plan as at 31 December 2006. Office of the Superintendent of Financial Institutions Canada, Ottawa, ON
- Chulis GS, Eppig FJ, Hogan MO, Waldo DR, Arnett III, RH (1993) Data watch: Health insurance and the elderly. *Health Aff* 12(1):111–118
- Citizenship and Immigration Canada (2007) *Facts and figures 2005 Immigration overview: Permanent and temporary residents*. Retrieved July 1, 2007, from <http://www.cic.gc.ca/english/resources/statistics/facts2005/foreword/index.asp>
- Clark (2000) 100 years of education. *Can Soc Trends* 59(Winter):3–7
- Congressional Budget Office (2004) *Financing long-term care for the elderly*. Congress of the United States, Washington, DC, Retrieved November 13, 2007, from <http://www.cbo.gov/ftpdocs/54xx/doc5400/04-26-LongTermCare.pdf>
- Coale AJ, Zelnik M (1963) *New estimates of fertility and population in the United States: A study of annual white births from 1855 to 1960 and of completeness of enumeration in the censuses from 1880 to 1960*. Princeton University Press, Princeton, NJ
- Cook FL, Marshall VW, Marshall JG, Kaufman JE (1994) The salience of intergenerational equity in Canada and the United States. In: Marmor T, Smeeding T, Greene V (eds), *Economic security and intergenerational justice: A look at North America*, Urban Institute Press, Washington, DC, pp 91–129
- Coyte PC (2000) *Home care in Canada: Passing the buck*. University of Toronto, Toronto, ON
- Crystal S, Johnson RW, Harman J, Sambamoorthi U, Kumar R (2000) Out-of-pocket health care costs among older Americans. *J Gerontol: Soc Sci* 55B(1):S51–S62
- Cullinane P (2006/2007) Promoting purposeful lives for greater good: Civic engagement programs of aging organizations. *Generations* 30(4):109–111
- Cutler DM, Poterba JM, Sheiner LM, Summers LH (1990) An aging society: Opportunity of challenge. *Brook Pap Econ Act* 1990(1):1–73
- Danzon PM (2000) Making sense of drug prices. *Regulation* 23(1):56–63
- Denton FT, Feaver CH, Spencer BG (1998) The future population of Canada: Its age distribution and dependency relations. *Can J Aging/La Revue Canadienne du Vieillissement* 17(1):83–109
- Denton FT, Gafni A, Spencer BG (2002) Exploring the effects of population change on the costs of physician services. *J Health Econ* 21:781–803

- Denton FT, Gafni A, Spencer BG (2003) Requirements for physicians in 2030: Why population aging matters less than you may think. *Can Med Assoc J* 168(12):1545–1547
- Denton FT, Spencer BG (2000) Population aging and its economic costs: A survey of the issues and evidence. *Can J Aging/La Revue Canadienne du Vieillissement* 19(Suppl 1):1–31
- Denton FT, Spencer BG (2002) Some demographic consequences of revising the definition of “Old Age” to reflect future changes in life table probabilities. *Can J Aging/La Revue Canadienne du Vieillissement* 21(3):349–356
- Department of Homeland Security (2008) Yearbook of immigration statistics: 2007. Retrieved April 1, 2008, from <http://www.dhs.gov/ximgt/statistics/publications/LPR07.shtm>
- Di Matteo L, Di Matteo R (2001) Public home care expenditures in Canada. *Can Public Policy - Analyse de Politiques* 37(3):313–333
- Doka KJ (1992) When gray is golden: Business in an aging America. *Futurist* 26(4):16–20
- Easterlin RA (2000) Growth and composition of the American population in the twentieth century. In: Haines MR, Steckel RH (eds): *A population history of North America*. Cambridge University Press, Cambridge, pp 631–675
- Elder GHJ (1975) Age differentiation and the life course. *Annu Rev Sociol* 1:165–190
- Espenshade TJ (1994) Can immigration slow U.S. population aging? *J Policy Anal Manag* 13(4):759–768
- Evans RG, McGrail KM, Morgan SG, Barer ML, Hertzman C (2001) Apocalypse no: Population aging and the future of health care systems. *Can J Aging/La Revue Canadienne du Vieillissement* 20(suppl. 1):160–191
- Foot DK (1989) Public expenditures, population aging and economic dependency in Canada, 1921–2021. *Popul Res Policy Rev* 8(1):97–117
- Foot DK, Stoffman D (1996) Boom, bust and echo: How to profit from the coming demographic shift. Macfarlane, Walter and Ross, Toronto, ON
- Foot DK, Venne R (2005) Awakening to the intergenerational equity debate in Canada. *J Can Stud* 39(1):5–21
- Ford D, Nault F (1996) Changing fertility patterns, 1974 to 1994. *Health Rep* 8(3):39–46
- Gee EM (1990) Demographic change and intergenerational relations in Canadian families: Findings and social policy implications. *Can Public Pol - Analyse de Politiques* 16(2):191–199
- Gee EM (2000) Population and politics: voodoo demography, population aging, and Canadian social policy. In: Gee EM, Gutman GM (eds) *The overselling of population aging: Apocalyptic demography, intergenerational challenges, and social policy*. Oxford University Press, Don Mills, ON, pp 5–25
- Gee EM (2002) Misconceptions and misapprehensions about population ageing. *Int J Epidemiol* 31(4):750–753
- Gemery HA (2000) The white population of the colonial United States, 1607–1790. In: Haines MR, Steckel RH, (eds), *A population history of North America*. Cambridge University Press, Cambridge, pp 143–190
- General Accounting Office (2002) Private pensions: Improving worker coverage and benefits. GAO, Washington, DC. Retrieved March 25, 2008, from <http://www.gao.gov/new.items/d02225.pdf>
- Gerdtham UG, Sogaard J, Andersson F, Jonsson B (1992) An econometric analysis of health care expenditure: A cross-section study of the OECD countries. *J Health Econ* 11:63–84
- Getzen TE (1992) Population aging and the growth of health expenditures. *J Gerontol* 47(3):S98–S104
- Gunderson M (2004) Banning mandatory retirement: Throwing out the baby with the bathwater. Background No. 79 Retrieved March 20, 2008, from www.cdhow.org/pdf/backgrounder_79.pdf
- Haines MR (1998) Estimated life tables for the United States, 1850–1910. *Hist Meth* 31(4):149–169
- Haines MR (2000) The white population of the United States, 1790–1920. In: Haines MR, Steckel RH (eds), *A population history of North America*. Cambridge University Press, Cambridge, pp 305–370
- Hakkio CS, Wiseman EJ (2006) Social security and medicare: The impending fiscal challenge. *Econ Rev - Fed Res Bank Kansas City* 91(1):7–41
- Henripen J (1994) The financial consequences of population aging. *Can Public Policy - Analyse de Politiques* 20(1):78–94
- Hering M, Klassen T (2006) Welfare regimes and retirement ages: Reform options and policy choices in Canada, Germany and South Korea, 1995–2005. Paper presented at the American Political Science Association Annual Meeting. Retrieved March 18, 2008, from <http://www.glendon.yorku.ca/english/faculty/researchcentres/api/pdf/retire.pdf>
- Heuser RL (1976) Fertility tables for birth cohorts by color: United States, 1917–1973. DHEW Publication (HRA) 76-1152. U.S. Government Printing Office, Washington, DC
- Hollis A (2004) How cheap are Canada’s drugs really? *J Pharm Pharm Sci* 7(2):215–216
- Hrung WB (2004) Information, the introduction of Roths, and IRA participation. *Cont Econ Anal Policy* 3(1):1–19
- Hughes ME, O’Rand AM (2004) The lives and times of the baby boomers. Population Reference Bureau and Russell Sage Foundation, Washington, DC and New York
- Hughes ME, Waite LJ (2004) The American family as a context for aging. In: Harper S (ed), *The family in an aging society*. Oxford University Press, Oxford
- Hughes ME, Waite LJ (2007) The aging of the second demographic transition. In: Schaie KW, Uhlenberg P (eds), *Social structures: The impact of demographic changes on the well-being of older persons*, Springer, New York, NY, pp 179–211
- Human Resources and Social Development Canada (2006a) Annual report of the Canada Pension Plan: Fiscal year 2004–2005. Government of Canada, Ottawa, ON
- Human Resources and Social Development Canada (2006b) Legislative framework: Mandatory retirement. Retrieved January 29, 2009, from http://www.hrsdc.gc.ca/eng/lp/spila/wlb/aw/27retirement_legislative02.shtml
- Human Resources and Social Development Canada (2007) Annual report of the Canada Pension Plan 2006–2007. Government of Canada, Ottawa, ON
- Johnson RW, Schaner SG (2005) Value of unpaid activities of older Americans tops \$165 billion per year. The Urban Institute, Washington, DC
- Johnson RW, Toohey D, Wiener J (2007) Meeting the long-term care needs of the baby boomers: How changing families

- will affect paid helpers and institutions. The Urban Institute, Washington, DC
- Kaiser Family Foundation (2007) Medicare: Medicare spending and financing. The Henry J. Kaiser Family Foundation, Washington, DC
- Kane RL, Kane RA (1994) Financing long-term care: Lessons from Canada. In: Marmor TR, Smeeding TM, Greene VL (eds), *Economic security and intergenerational justice: A look at North America*. The Urban Institute Press, Washington, DC, pp 301–323
- Kieran P (2001) Early retirement trends. *Perspectives* 2(9):5–11
- Kim YIA (2007) Impact of birth subsidies on fertility: Empirical study of allowance for newborn children, a pronatal policy. University of Chicago, IL
- Kirk D (1996) Demographic transition theory. *Popul Stud* 50(3):361–387
- Lesthaeghe R (1995) The second demographic transition in western countries: An interpretation. In: Mason KO, Jensen AM (eds), *Gender and family change in industrialized countries*. Clarendon Press, Oxford, pp 17–62
- Levitt SD (1999) The limited role of changing age structure in explaining aggregate crime rates. *Criminology* 37(3):581–597
- Little JS, Triest RK (2002) The impact of demographic change on US labor markets. *New Engl Econ Rev (First Quarter)*, 47–68
- Lum TY, Lightfoot E (2005) The effects of volunteering on the physical and mental health of older people. *Res Aging* 27(1):31–55
- Lusardi A, Skinner J, Venti S (2003) Pension accounting and personal saving. Center for Retirement Research at Boston College, Boston, MA
- Mannheim K (1952) The problem of generations. In: *Essays on the sociology of knowledge*. Routledge and Kegan Paul, London, pp 276–322
- Marmor T, Oberlander J (1998) Rethinking medicare reform. *Health Aff* 17(1):52–68
- Marshall VW, Cook FL, Marshall JG (1993) Conflict over intergenerational equity: Rhetoric and reality in a comparative context. In: Bengtson VL, Achenbaum WA (eds), *The changing contract across generations*. Aldine De Gruyter, New York, pp 119–140
- Martin P, Midgley E (2003) Immigration: Shaping and reshaping America. *Popul Bull* 58(2):1–44
- Martinson M (2006/2007) Opportunities or obligations? Civic engagement and older adults. *Generations* 30(4):59–65
- McDaniel SA (1986) Canada's aging population. Butterworths, Toronto, ON
- McDaniel SA (2003) Toward disentangling policy implications of economic and demographic changes in Canada's aging population. *Can Public Policy - Analyse de Politiques* 29(4):491–510
- McDaniel SA, Chappell NL (1999) Health care in regression: Contradictions, tensions and implications for Canadian seniors. *Can Public Policy - Analyse de Politiques* 25(1):123–132
- McGarry K (1996) Factors determining participation of the elderly in supplemental security income. *J Hum Res* 31(2):331–358
- McInnis M (2000a) The population of Canada in the nineteenth century. In: Haines MR, Steckel RH (eds), *A population history of North America*, Cambridge University Press, Cambridge, pp 371–432
- McInnis M (2000b) Canada's population in the twentieth century. In: Haines MR, Steckel RH (eds) *A population history of North America*, Cambridge University Press, Cambridge, pp 529–600
- McMullin JA, Tomchick TL (2004) To be employed or not to be employed?: An examination of employment incentives and disincentives for older workers in Canada. *Workforce Aging in the New Economy*, University of Western Ontario, ON
- Merette M (2002) The bright side: A positive view on the economics of aging. *Choices: Econ Growth, Inst Res Public Policy* 8(1):2–28
- Milligan K (2002) Quebec's baby bonus: Can public policy raise fertility? C.D. Howe Institute, Toronto, ON
- Morgan DL, Schuster TL, Butler EW (1991) Role reversals in the exchange of social support. *J Gerontol: Soc Sci* 46: S278–S287
- Mullan P (2000) The imaginary time bomb: Why an ageing population is not a social problem. St. Martin's Press, New York, NY
- Munnell AH, Sunden A, Lidstone E (2002) How important are private pensions? Center for Retirement Research at Boston College, Boston, MA
- Munnell AH (2004) Population aging: It's not just the baby boom. Center for Retirement Research at Boston College, Boston, MA
- National Advisory Council on Aging (1999) 1999 and beyond: Challenges for an aging Canadian society. National Advisory Council on Aging, Ottawa, ON
- National Alliance for Caregiving (2005) Caregiving in the U.S. AARP, Washington, DC
- National Center for Health Statistics (2008) Vital statistics of the United States, 2002 Volume I, Natality, Internet Release. Retrieved April 2, 2008, from http://www.cdc.gov/nchs/data/statab/natfinal2002.annvol1_07.pdf
- National Center for Health Statistics (2008) Health data for all ages. Retrieved April 15, 2008, from http://www.cdc.gov/nchs/health_data_for_all_ages.html
- National Coalition on Health Care (2008) Health care in Canada. World Health Care Data Retrieved March 27, 2008, from <http://www.nchc.org/facts/Canada.pdf>
- Neugarten BL (1975) The future and the young-old. *Gerontologist*, 15(1):4–9
- Northcott HC (1994) Public perceptions of the population aging 'Crisis'. *Can Public Policy - Analyse de Politiques* 20(1):66–77
- O'Connell JM (1996) The relationship between health expenditures and the age structure of the population in OECD countries. *Health Econ* 5:573–578
- Ory MG, Hoffman RR, Yee JL, Tennstedt S, Schulz R (1999) Prevalence and impact of caregiving: A detailed comparison between dementia and nondementia caregivers. *Gerontologist* 39(2):177–185
- Osberg L (2003) Long run trends in income inequality in the United States, UK, Sweden, Germany and Canada: A birth cohort view. *East Econ J* 29(1)
- Ostbye T, Crosse E (1994) Net economic costs of dementia in Canada. *Can Med Assoc J* 51(10):1457–1464
- Palmer JL (2006) Entitlement programs for the aged: The long-term fiscal context. *Res Aging* 28(3):289–302

- Peterson PG (1999) Gray dawn: The global aging crises. *Foreign Aff* 78(1):43–55
- Porterba JM, Summers LH (1987) Public policy implications of declining old age mortality. In: Burtless G (ed) *Work, health and income among the elderly*, Brookings, Washington, DC, pp 19–51
- Posner RA (1995) *Aging and old age*. University of Chicago Press, Chicago, IL
- Powers ET, Neumark D (2005) The supplemental security income program and incentives to claim social security retirement early. *Natl Tax J* 58(1):5–26
- Preston S, Himes C, Eggers M (1989) Demographic conditions responsible for population aging. *Demography* 26(4):691–704
- Prince MJ (2000) Apocalyptic, opportunistic, and realistic demographic discourse: Retirement income and social policy or chicken littles, nest-eggies, and humpty dumpties. In: Gee EM, Gutman GM (eds) *The overselling of population aging: Apocalyptic demography, intergenerational challenges, and social policy*, Oxford University Press, Don Mills, ON, pp 99–113
- Purcell P (2005) Older workers: Employment and retirement trends. In: Mitchell OS, Clark RL (eds) *Reinventing the retirement paradigm*, Oxford University Press, Oxford, pp 55–69
- Quadagno J (2004) Why the United States has no national health insurance: Stakeholder mobilization against the welfare states, 1945–1996. *J Health Soc Behav* 25(Extra Issue):25–44
- Quinn JF (2002) Changing retirement trends and their impact on elderly entitlement programs. In: Altman SH, Schactman DI (eds) *Policies for an aging society*, The Johns Hopkins University Press, Baltimore, MD: pp 293–315
- Regie des rentes du Quebec (2003) Actuarial report of the Quebec Pension Plan as at 31 December 2003. Regie des rentes du Quebec, Quebec City, QC
- Regie des rentes du Quebec (2008) Application for a retirement pension. Retrieved March 1, 2008, from www.rrq.gouv.qc.ca/NR/rdonlyres/40986E1D-BB7D-46D9-9FEA-7E756B5DEc94/0/B001_en.pdf
- Reinhardt UE (2003) Does the aging of the population really drive the demand for health care? *Health Aff* 22(6):27–39
- Riley R, Kanigan M (1989) Surgical procedures and treatments, 1985–1986. *Health Reports* 1(2):253–254
- Roberts A (2003) In the eye of the storm? Societal aging and the future of public-service reform. *Public Admin Rev* 63(6):720–733
- Robine JM, Michel JP (2004) Looking forward to a general theory on population aging. *J Gerontol: Med Sci* 59A(6):590–597
- Rosenthal CJ (1994) Editorial: Long-term care reform and “family” care: A worrisome combination. *Can J Aging/ La Revue Canadienne du Vieillessement* 13(4):419–422
- Rosenthal CJ (2000) Aging families: Have current changes and challenges been ‘oversold’? In: Gee EM, Gutman GM (eds) *The overselling of population aging: Apocalyptic demography, intergenerational challenges, and social policy*. Oxford University Press, Don Mills, ON, pp 45–63
- Ruble DA (1994) Medical technology in Canada, Germany, and the United States: An update. *Health Aff* 13(4):113–117
- Ryder NB (1965) The cohort as a concept in the study of social change. *Am Sociol Rev* 30:843–861
- Sahyoun N, Pratt LA, Lentzner H, Dey A, Robinson KN (2001) *The changing profile of nursing home residents: 1985–1997*. National Center for Health Statistics, Hyattsville, MD
- Smith GE, Kokmen E, O’Brien PC (2000) Risk factors for nursing home placement in a population-based dementia cohort. *J Am Geriatr Soc* 48(5):519–525
- Social Development Canada (2005) *Canada pension plan*. Social Development Canada, Ottawa, ON
- Social Security Administration (1999, July) *The future of social security*, Pub. No. 05-10055
- Social Security Administration (2007a) *Annual report of the supplemental security income program*. Retrieved March 20, 2008, from www.socialsecurity.gov/OACT/ssir/SSI07/ssi2007.pdf
- Social Security Administration (2007b) *Understanding supplemental security income (SSI)*. Retrieved March 27, 2008, from www.ssa.gov/ssi/USI2007final.pdf
- Social Security Administration (2008) *Retirement benefits*. Retrieved March 20, 2008, from www.socialsecurity.gov/pubs/10035.pdf
- Social Security and Medicare Boards of Trustees (2008) *Status of the social security and medicare programs: A summary of the 2008 annual reports*. Retrieved April 23, 2008, from <http://www.ssa.gov/OACT/TRSUM/index.html>
- Springstead GR, Wilson TM (2000) Participation in voluntary individual savings accounts: An analysis of IRAs, 401(K)s, and the TSP. *Soc Secur Bull* 63(1):34–39
- Spurgeon D (2000) Canada faces nurse shortage. *Br Med J* 320(7241):1030
- Statistics Canada (1999a) *Report on the demographic situation in Canada 1998*. Minister of Industry, Ottawa, ON. Retrieved April 3, 2008, from <http://www.statcan.ca/english/freepub/91-209-XIE/91-209-XIE1999000.pdf>
- Statistics Canada (1999b) *Vital statistics compendium 1996*. Minister of Industry, Ottawa, ON. Retrieved April 2, 2008, from <http://www.statcan.ca/english/freepub/84-214-XIE/0009684-214-XIE.pdf>
- Statistics Canada (2002) *2001 Census Analysis Series - Profile of the Canadian population by age and sex: Canada ages*. Statistics Canada, Ottawa, ON. Retrieved January 28, 2009, from <http://www12.statcan.gc.ca/english/census01/Products/Analytic/companion/age/images/96F0030XIE2001002.pdf>
- Statistics Canada (2003a) *Canada’s ethnocultural portrait: The changing mosaic*. Statistics Canada Catalogue No. 96f003xie2001008. Minister of Industry, Ottawa, ON
- Statistics Canada (2003b) *Canada’s retirement income programs: Statistical overview (1990–2000)*. Statistics Canada catalogue No. 74-507-Xpe. Minister of Industry, Ottawa, ON
- Statistics Canada (2005) *Population projections for Canada, Provinces and Territories 2005–2031*. Demography Division, Ottawa, ON
- Statistics Canada (2006a) *The Daily*, July 21 2006. Minister of Industry, Ottawa, ON. Retrieved April 2, 2008, from <http://www.statcan.ca/Daily/English/070921/d070921.pdf>
- Statistics Canada (2006b) *Report on the demographic situation in Canada 2000*. Minister of Industry, Ottawa, ON. Retrieved April 2, 2008, from <http://www.statcan.ca/english/freepub/91-209-XIE/91-209-XIE2000000.pdf>
- Statistics Canada (2006c) *Report on the demographic situation in Canada 2003 and 2004*. Minister of Industry, Ottawa, ON.

- Retrieved April 2, 2008, from <http://www.statcan.ca/english/freepub/91-209-XIE/91-209-XIE2003000.pdf>
- Statistics Canada (2006d) Annual demographic estimates: Canada, Provinces and Territories 2005–2006. Minister of Industry, Ottawa, ON
- Statistics Canada (2007) A portrait of seniors in Canada: 2006. Minister of Industry, Ottawa, ON
- Statistics Canada (2007a) Portrait of the Canadian population in 2006. Minister of Industry, Ottawa, ON. Retrieved April 2, 2008, from <http://www12.statcan.ca/english/census06/analysis/popdwell/index.cfm>
- Statistics Canada (2007b) The Daily, September 21 2007. Minister of Industry, Ottawa, ON. Retrieved April 2, 2008, from <http://www.statcan.ca/Daily/English/060731/d060731.pdf>
- Statistics Canada (2008) Census 2001 standard data products: Topic based tabulations. Retrieved April 5, 2008, from <http://www12.statcan.ca/english/census01/products/standard/themes/index.cfm>
- Statistics Canada (2008a) Historical statistics of Canada, Section B: Vital Statistics and Health Retrieved April 14, 2008, from <http://www.statcan.ca/bsolc/english/bsolc?catno=11-516-X>
- Statistics Canada (2008b) Census 2006 standard data products: Topic based tabulations. Retrieved April 5, 2008, from <http://www12.statcan.ca/english/census06/data/topics/index.cfm?Temporal=2006andAPATH=3>
- Stone RI, Wiener JM (2001) Who will care for us? Addressing the long-term care workforce crisis. The Urban Institute and the American Association of Homes and Services for the Aging, Washington, DC
- Strunk BC, Ginsburg PB, Banker MI (2006) The effect of population aging on future hospital demand. *Health Aff* 25, W141–W149
- Thornton R (2000) Population history of North American Indians. In: Haines MR, Steckel RH (eds) *A population history of North America*. Cambridge University Press, Cambridge, pp 9–50
- Turcotte M, Schellenberg G (2007) A portrait of seniors in Canada: 2006. Statistics Canada Catalogue No. 89-519-Xie2006001. Minister of Industry, Ottawa, ON
- Uhlenberg P (1996) Mortality decline in the twentieth century and supply of kin over the life course. *Gerontologist* 36:681–685
- United Nations (2001) Replacement migration: Is it a solution to declining and ageing populations? Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, New York, NY
- United Nations (2007) World population prospects: The 2006 Revision. Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, New York, NY
- United States Census Bureau (1872a) Ninth census, Volume I: Statistics of the population of the United States. Retrieved June 6, 2007, from <http://www2.census.gov/prod2/decennial/documents/1870a-10.pdf>
- United States Census Bureau (1872b) Ninth Census, Volume II: The vital statistics of the United States. Retrieved June 6, 2007, from <http://www2.census.gov/prod2/decennial/documents/1870b-09.pdf>
- United States Census Bureau (1950) Statistical abstract of the United States 1950. Retrieved June 6, 2007, from <http://www2.census.gov/prod2/statcomp/documents/1950-02.pdf>
- United States Census Bureau (1970) Statistical abstract of the United States 1970. Retrieved June 6, 2007, from <http://www2.census.gov/prod2/statcomp/documents/1970-02.pdf>
- United States Census Bureau (1973) 1970 Census of the Population, Volume 1 Part 1. Retrieved June 8, 2007, from http://www2.census.gov/prod2/decennial/documents/1970a_us1-07.pdf
- United States Census Bureau (1975) Historical statistics of the United States, Colonial times to the present, volume I. Government Printing Office, Washington, DC
- United States Census Bureau (1988) Statistical abstract of the United States 1988. Retrieved June 6, 2007, from <http://www2.census.gov/prod2/statcomp/documents/1988-02.pdf>
- United States Census Bureau (2000a) National population projections. Retrieved April 11, 2008, from <http://www.census.gov/population/www/projections/natproj.html>
- United States Census Bureau (2000b) Statistical abstract of the United States 2000. Retrieved June 6, 2007, from <http://www.census.gov/prod/2001pubs/statab/sec01.pdf>
- United States Census Bureau (2002) Statistical abstract of the United States 2002. Retrieved June 6, 2007, from <http://www.census.gov/prod/2003pubs/02statab/pop.pdf>
- United States Census Bureau (2004a) Interim projections of the US population by age, sex, race, and Hispanic origin: Summary methodology and assumptions. Retrieved April 11, 2008, from <http://www.census.gov/ipc/www/usinterimproj/idbsummeth.html>
- United States Census Bureau (2004b) U.S. interim projections by age, sex, race, and Hispanic origin. Retrieved April 11, 2008, from <http://www.census.gov/ipc/www/usinterimproj>
- United States Census Bureau (2005) 65+ in the United States: 2005. United States Government Printing Office, Washington, DC
- United States Census Bureau (2007) Statistical abstract of the United States 2007. Retrieved June 6, 2007, from www.census.gov/prod/2006pubs/07statab/pop.pdf
- Wachino V, Schneider A, Ku L (2005) Medicaid budget proposals would shift costs to states and be likely to cause reductions in health coverage. Center on Budget and Policy Priorities, Washington, DC
- Walsh LS (2000) The African American population of the Colonial United States. In: Haines MR, Steckel RH (eds) *A population history of North America*, Cambridge University Press, Cambridge, pp 191–240
- Wiener JM, Stevenson DG (1998) Long-term care for the elderly: Profiles of thirteen states. The Urban Institute, Washington, DC
- Wiener JM, Tilly J (2002) Population ageing in the United States of America: Implications for public programs. *Int J Epidemiol* 31(4):776–781

Chapter 11

Aging in Mexico and Latin America

Rebeca Wong and Alberto Palloni

Introduction

Latin America and the Caribbean (LAC) is one of the fastest aging geographic regions in the developing world. The growth in the percentage of elderly (the number of those aged 65 and older divided by the total population) between 2000 and 2025 is projected to be 17 per cent for Sub-Saharan Africa, 47 per cent for the Near East, 79 per cent for Asia (excluding Near East) and 82 per cent for LAC (U.S. Bureau of the Census 2000). Rapid mortality and fertility decline in the last half of the twentieth century started the process of aging in the LAC region, a process that should accelerate starting around 2030. Thus, the period for investment in infrastructure to assist LAC societies is imminent, in particular because infrastructures such as financial markets, human resources to provide health care and investments in the young are deemed to translate into well-being of the future elderly of the region but these systems take two or three decades to formulate or reach maturity. The geographic location of this region, just south of the United States and Canada, also represents peculiar challenges and opportunities for the aging of the LAC populations. Overall, the current and future aging of the countries in this region convey a mixed picture of privileges and disadvantages.

This chapter provides an overview of the aging process in the region of Latin America and the Caribbean, briefly and in more detail in Mexico. We take an approach that considers aging from a broad socio-

economic perspective; we focus on a select group of economic, social, institutional and health factors that relate to aging of a population and highlight what we consider unique features of the aging process in the region. For the section that refers to Mexico, we look at the aging process in more detail from the perspective of the past, present and future. The *past* demographic, economic and political context of Mexico set the stage in which the current elderly grew up and developed and formed the blueprint of their current old age conditions. We characterize the *current* cohorts of older adults to provide a picture of the challenges that the Mexican society faces in the short- and medium-term to secure well-being of their aging population. And finally, the *future*; we consider the attributes of the current young as well as the future generations of older Mexicans, to speculate about the aging scenario in Mexico in the decades to come.

Aging in Latin America and the Caribbean

Regional Trends and Peculiarities

According to the United Nations, Latin America and the Caribbean refers to the region formed by the 20 countries south of the United States (Brea 2003). This region experienced explosive population growth towards the middle of the 20th century, when two demographic trends overlapped and broadly swept the region: increasing fertility and falling mortality. Population growth reached 2.8 per cent per year in the decade of the 1960s and decelerated around 1970 when fertility started falling sharply. This demographic process

R. Wong (✉)
Department of Preventive Medicine and Community Health
University of Texas Medical Branch
301 University Boulevard
Galveston, TX, USA
E-mail: rewong@utmb.edu

was concurrent with an economic transformation of the region, changing from predominantly agriculture-dominant rural to manufacture- and services-oriented urban economies. Around the year 2000, the population of LAC was approximately 520 million people; three-quarters resided in urban areas, and by then most of the population growth took place in cities of medium size as opposed to the mega-cities (Brea 2003). In addition, with the fall of fertility and mortality well established by the year 2000, aging of the population started. This aging phenomenon represents at once the success of the population and health policies set in place over the previous 30–50 years and challenges for the future to meet the needs of the growing number of older adults (Kinsella and Phillips 2005).

The demographic transition swept the region at different rates across the countries. In the year 2000, the proportion of the population aged 65 years and older in the region was 5 per cent and is projected to reach 17 per cent in 2050. However, by 2025, the front-runners – Argentina, Barbados, Brazil, Chile, Cuba, Puerto Rico, Trinidad and Uruguay – should have already achieved fractions of at least 15 per cent. Although all countries in the region experienced *mortality* declines that began mostly after World War II, again not all countries experienced similar pace in the transition. For example, Bolivia and Haiti still lag significantly behind in the mortality gains enjoyed by the rest of the region. Although *fertility* began to drop prior to 1945 in several countries (Argentina, Cuba, Puerto Rico and Uruguay), most countries had high fertility until the late 1960s and early 1970s. Uruguay is currently the oldest country, with 13 per cent of the population aged 65 or older in 2000, compared to 3.5 per cent in Honduras and Nicaragua. The countries that experienced the most rapid fertility decline will also undergo the fastest aging. Between 2000 and 2050, the fraction of the population aged 65 and older will increase from 10 to 27 per cent in Cuba and from 5 to 18 per cent in Brazil.

Several features distinguish future aging in the region (Palloni et al. 2002). *First*, the projected speed of demographic aging in LAC will be faster than has ever been experienced in the world. The time it will take a typical country in the region to attain a substantial fraction of people above age 60, say around 15 per cent, from current levels of around 8 per cent is less than two fifths the length of time it took the U.S. and between one fifth and two fifths of the time it took an average Western European country to attain similar

levels (Palloni and Pelaez 2002; Kinsella and Velkoff 2001). If current demographic trends continue, we should expect that for the next three to five decades the speed of aging in the region will persist on a singularly fast course, as a consequence of demographic forces set in motion long ago.

Second, demographically premature aging takes place in countries unable to generate sustained high standards of living. Comparisons between the wealthiest countries in LAC, on the one hand and the United States, Sweden or Japan, on the other, are revealing. Even optimistic projections of growth in gross national product (GNP) per capita imply that when the fraction of elderly people begins to exceed 10 per cent, countries of the region will attain no more than a small fraction (about one tenth) of the levels of GNP per capita enjoyed *by developed countries when they were reaching similar levels of aging*. By comparison, Sweden spent 77 per cent of the time during which rapid aging was occurring and enjoying a high standard of living; the U.S. spent 95 per cent of the time and Japan 100 per cent of the time. Without unprecedented economic expansion, countries in LAC will generally experience rapid aging combined with precarious standards of living.

Third, another generalized trend in the region is the relative speed and magnitude of aging, on the one hand and the social and political contexts within which the process is taking place, on the other. A traditional order in which elderly well-being rests on the younger generation is being gradually subverted by shifts in norms regulating living arrangements and by rapid fertility declines (De Vos 1990; De Vos and Palloni 2002; Palloni 2001). Admittedly, traditional living arrangements changed dramatically in North America and Western Europe as well but this occurred well before rapid aging (Ruggles 1996; Palloni 2001). Furthermore, aging is occurring in a fragile institutional environment (Cutler et al. 2000), one in which the bulk of sources guaranteeing minimum levels of social and economic support for the elderly are being reformed and in some cases, eliminated. A good example of this is the sustained and widespread drive toward reform of social security systems with a tendency towards privatization (Cruz-Saco and Mesa-Lago 1998; Barrientos 1997; Klinsberg 2000). In summary: in almost all cases a highly compressed aging process will take place in the midst of weak economic performance, rapidly changing inter-generational relations, fragile institutional contexts and shrinking access to health care services.

Fourth, birth cohorts reaching age 60 and over after 1990 in LAC are unique in that they are largely the product of medical interventions that increased childhood survival in the absence of significant improvements in standards of living. An estimated 50–70 per cent of the mortality decline taking place after 1945 was associated with medical interventions (Preston 1976; Palloni and Wyrick 1981). An interesting feature of the phenomenon is that a large fraction of these gains were concentrated early in life, between birth and age 5 or 10. Frailty among members of cohorts blessed by new medical technology could be higher than if mortality had remained constant or had declined due to improved standards of living. This is so for two reasons. First, the lives saved by mortality decline were not random relative to conditions affecting health status (Vaupel et al. 1979). They were drawn from populations exposed to higher risks, whose morbidity experiences were dominated by exposure to infectious diseases and early malnutrition. Second, since most childhood morbid conditions responsible for higher mortality before the interventions continued to affect children, their influence must have been felt by a growing number of survivors drawn from high mortality subpopulations. This has important implications *if early childhood conditions exert an impact on adult health and mortality*. Evidence that early childhood conditions affect adult health is mounting fast and cannot be ignored. Empirical data (Ruiz-Pantoja and Ham-Chande 2007) as well as theoretical arguments (Barker 1998; Kuh and Ben-Shlomo 2004; Elo and Preston 1992; Schaffer 2000) implicate a broad array of factors.

Four sets of factors experienced early in childhood that may influence later health are identified in the literature. First, conditions in utero or developed shortly before or around birth may remain latent for long periods and can become expressed in late adulthood as chronic conditions. These factors could involve either fixed traits that individuals are born with or, more interestingly, stresses and uneven development of physiological systems that follow periods of moderate and severe deprivation and that remain latent until late in life (what is known as “the fetal origins hypothesis,” Barker 1998). Some examples of this are the connection between substandard early growth and development and diabetes (Barker, 1998; Lithell et al. 1996). The hypothesis has been generalized to suggest that substandard nutritional status early in childhood can induce similar responses later in adulthood (Scrimshaw 1997). A sec-

ond set of factors are episodes of illnesses experienced during early childhood that may directly cause the late onset of some chronic diseases (Elo and Preston 1992; Hertzman 1994; Barker 1998). The most frequently invoked example of this type of mechanism is the one relating adult heart disease and rheumatic heart fever. A third set of factors is the connection between recurrent bouts of infectious diseases during early childhood, processes of sustained inflammation in later life and the early onset of coronary heart disease (Finch and Crimmins 2004; Crimmins and Finch 2006; Costa et al. 2007; Fong 2000). The original conjecture is that individuals who benefit from reduced exposure to *some* infectious and parasitic diseases during early childhood (Fong 2000) will be, *ceteris paribus*, less exposed to the risk of some chronic conditions. But, if the connection between recurrent infections, inflammation and chronic conditions proves to be correct, it could lead to *more, not less* prevalence of adult chronic conditions whenever excess survival to adult ages is due to augmented resistance to infections or to reductions in their intensity or lethality rather than to factors that reduce overall exposure. A fourth set of factors is more general and refers to socioeconomic conditions experienced in early childhood that could have deleterious effects on late adult health. The interpretation of the effects of these factors conventionally invokes either the existence of “Barker-effects” or the influence of early illnesses, or oftentimes implicates complicated mechanisms that lead from, for example, deprivation early in life to life-styles that produce cumulative deleterious effects in the absence of the intervention of either “Barker-effects” or early episode of illnesses (Hertzman 1994; Cynader 1994; Barker 1998; Schaffer 2000).

If any of these factors has significant effects, increases in frailty among elderly whose earlier experiences fit the description provided above are likely to be pronounced. Our understanding of the relations between early childhood exposures and adult health status is still too primitive to establish precise predictions regarding the nature of expected health impairments.

Fifth, the regimes of morbidity and mortality experienced by elderly people in developing countries such as those in LAC are unique. There is an expansion of chronic conditions such as heart and lung disease, cancers, diabetes and arthritis. Some of these conditions are connected with the adoption of a Western life style whereas others are increasing as a result of a higher

number of individuals surviving to old ages. Simultaneously, however, older adults continue to experience significant levels of infectious diseases (Frenk et al. 1991). Whether through clinical or epidemiological studies, we know little about the consequences of these types of disease environments on general health status, disability or mortality, absent from the much heralded epidemiological transition framework (Omran 1982). The demographic and epidemiological literature has to make substantial strides before we can fully understand the implications of these mixed regimes of disease on the adult population (Popkin 1993; Albala et al. 2000). The countries of LAC fit this characterization in general.

Sixth, perhaps the most salient feature of recent appraisals of the health status of elderly populations in LAC as well as in countries with heavy Hispanic origins (such as Puerto Rico), is the markedly high prevalence of obesity and diabetes, particularly among women (Palloni et al. 2003, 2006, 2007). This finding is consistent with the rapid increase of obesity and diabetes in young and adult populations in the area (Albala et al. 2000). It has been variously attributed to the adoption of a “Western” diet paired with increasingly sedentary life styles (Popkin 1993; Albala et al. 2000). In addition, other forces are probably at play. In particular, late onset diabetes is one of the conditions somewhat successfully linked to early nutritional deprivation (Barker 1998; Kuh and Ben-Shlomo 2004). There is partial evidence that finds an association between diabetes prevalence and incidence and unfavorable experience of early childhood conditions or with indicators of early malnutrition (Palloni et al. 2007). Although the conjecture that obesity during late adolescence and early adulthood is related to malnutrition and health conditions early in life has been tested (Schroeder et al. 1999; Martorell et al. 2001), there is also population-based evidence linking early life conditions and obesity in late life (Palloni and McEniry 2007).

Inequality and Indigenous Populations

Rapid urbanization swept the region during the 20th century as mentioned above, such that LAC is now one of the most urbanized regions of the world, with urban shares comparable to the ones in Europe and the United States (Brea 2003). And because of massive migration

from rural areas to the cities that peaked in the 1960s, most of the population now lives in urban areas. This is again a regional trend, masking the diversity across the countries. For example, as of the year 2000, less than 50 per cent of the population in Guatemala, Haiti and Honduras lived in urban areas. In general, large public investments tended to be directed to cities, creating inequalities in access to human capital such as education and health care between residents of cities and small towns. Urban-rural differences are well known and historical in the region, with rural residents often having poor or no access to health care or basic sanitary services. According to data from the Mexican census for example, around the year 2000, 16 per cent of the population who lived in small rural communities (populations less than 2500) had access to health insurance, compared to 56 per cent of those in large cities (populations of 100,000 or more). It is worth mentioning that ethnic minorities, among the poorest strata in the countries, tend to reside in rural areas. Mexico has the largest absolute number of indigenous persons in LAC, with 10.4 million around the year 2000, followed by Peru (9 million) and Bolivia (4 million). In Guatemala almost 90 per cent of the indigenous population was living below the poverty line around the year 2000, compared with two-thirds of the overall population (Torres et al. 2003). These divides may have long-term consequences on the well-being of the older adults in the region; the burden of disability may be larger for the poorest and isolated groups of the population.

Countries in the LAC region differ greatly not only economically and politically but also in the way they protect citizens and households from the economic consequences of negative health outcomes in terms of catastrophic health expenses, health care needs and loss of income. These results impact the elderly in particular. For example, Brazil, Chile and Mexico have health expenditures per capita about one-half of those of Argentina, Barbados and Uruguay. Cuba spends about one-fifth but public expenditure as a part of the GDP reveals, however, that Cuba’s investment in health is relatively high. There is also large variation across countries in the structure and achievement of health care systems and the role played by the public health sector. For example, in Barbados, Brazil and Cuba the Health Ministry guarantees services to all. In Mexico and Uruguay, different social security programs combine to cover the employed population,

with nominal universal coverage for the uninsured. In Mexico, the uninsured includes those working in the informal sectors, which tend to opt out of coverage (Parker and Wong 2001). In Argentina and Chile the private sector plays a major role, resulting in a system that combines individual social security programs and compulsory individual insurance. As a reference, the United States system offers public-sector coverage only to vulnerable groups, such as the elderly or the poor. Thus the contrasts in overall health coverage are wide, ranging from virtually universal coverage in Cuba, to 40 per cent lacking access to care in Mexico, 13 per cent in Uruguay and 4 per cent in Chile (CISS 2003).

In the presence of fragile institutional environments, as has been described for the region, the network of social and institutional support available to older adults plays a prominent role in the likely consequences of aging. Glaser et al. (2006) examined the family structure and support for older persons with a cross-national perspective, using data from seven urban centers in LAC. In countries with very advanced fertility transition (such as Argentina and Uruguay), adults aged 60 or older have fewer children (2.3–2.8 on average) compared to those with advanced transitions (such as Chile and Cuba), which report an average of 3–3.5 and those with progressing transitions (such as Mexico) with an average of 4.9 children. Older adults in societies with earlier transitions report more childlessness, higher levels of living alone and lower propensity to live with their children. The receipt of support by older adults broadly reflects the timing of fertility transition as well. For example, financial help from children is generally higher in Mexico than in Argentina or Uruguay (Glaser et al. 2006: 281). Despite this generalized prevalence of family support, in general the provision of support by community groups or other institutions is low across the countries in LAC.

In addition to health care, the provision of economic support in old age is perceived as a critical challenge for governments in the region over the next few decades, given the imminent volumes of elderly expected in the foreseeable future. During the last two decades, a handful of countries in LAC instituted social security reforms aimed at making the old-age pension systems financially sustainable and beneficial for economic growth. These are consistent with the movement that took place in transition economies of Eastern and Central Europe and the former Soviet Union, as well as

many OECD countries. A pioneer in the LAC region was the reform instituted by Chile in 1981. The new systems tend to replace a public (government-managed) system with a multi-pillar scheme that combines private accounts managed by private institutions and public components usually including a minimum pension. With substantial variations, other countries have set up similar systems, for example Argentina in 1994 and Mexico in 1997 (James et al. 2003). The new systems have not been in effect long enough to mature and current retirees are subject to a mixture of old and new system benefits. Further refinements to the new systems are expected as impact evaluations on a variety of dimensions are performed, including financial sustainability, savings rates, well-being of sub-groups of the population and health (Sinha and Yanez 2007). However, the steps taken thus far seem instrumental to initiate reforms in systems that take about three decades to mature. Critical populations that are excluded from this generation of reforms are the workers in the informal labor markets, who tend to be predominantly those with low education and women. Overall in the region however, there are few provisions to extend coverage of the social security systems to the overall population because these extensions are perceived as financially unsustainable.

International Migration and Aging

The geographical proximity of LAC to the United States and Canada sets the aging process of the region apart from the global aging picture as well. In the year 2000, almost 13 per cent of the United States and Canada combined populations were aged 65 or older, compared with 5 per cent of the collective LAC populations. For 2030, the corresponding projections are 20.3 per cent and 11.6 per cent respectively (Brea 2003; Palloni et al. 2002). For small sending countries in Central America and the Caribbean, emigration to the United States has contributed to aging of the sending countries in a significant way, since young adults are most likely to leave looking for economic opportunities. Although a distant second, Canada has begun to gain importance as a destination country for LAC emigrants. The flip side of this flow of migrants is that sizable remittances sent back by migrants are a large means of support in the sending countries, espe-

cially support of elderly relatives. Later in this chapter we provide details for the case of Mexico. The interdependence between north and south will likely persist in the decades to come; the flow of “young” migrants will continue to foster the north’s economic competitiveness in global markets; increasingly this flow of labor may help to meet the needs for hands-on health care of aging societies in the north; and remittances will continue to help the well-being of people in the south, in particular older adults.

Comparative Studies of Aging in the LAC Region

Several population-based studies have emerged in LAC in recent years, to study population aging and health processes with a wide socioeconomic perspective and some allow cross-national comparisons as well. For example, a multi-center study on the health and well-being of older adults in seven urban centers (capital cities or largest cities) of LAC, *Salud y Bienestar en el Envejecimiento*, was conducted around the year 2000 for individuals aged 60 and older (SABE 2007). This study has representative samples from the cities of Buenos Aires, Bridgetown, Sao Paulo, Habana, Santiago, Mexico City and Montevideo. Although representative of major cities only, this study offers the potential to compare aging processes within the countries in LAC, because the data were gathered with strictly comparable survey protocols and instruments (Palloni and Peláez 2002; Wong et al. 2006). In Mexico, a national prospective *Mexican Health and Aging Study* on adults age 50 and older conducted a baseline survey in 2001, with a follow-up of the same individuals in 2003 (more on this study below; see also MHAS 2007). In Puerto Rico, the study *Condiciones de Salud de los Adultos de Edad Mayor* (PREHCO 2007) was fielded in 2002 to gather data on a national representative sample of adults aged 60 and older and their spouse or partner. In Costa Rica, the longitudinal study *Estudio de Longevidad y Envejecimiento Saludable* (CRELES 2007) conducted a baseline interview in 2004–2006 of a national sample of persons born in 1946 or earlier. While these studies have unique characteristics tailored to meet the needs of the context or countries of study, they share common attributes that allow for in-depth cross-national studies in LAC. Also,

these same attributes allow for comparisons with the U.S. and other countries in Europe and Asia.

Comparative population-based studies in the region have devoted attention to chronic conditions, disability and use of health care services as main determinants of the quality of life of older adults (Reyes-Ortiz et al. 2006a, b). Diseases that are highly prevalent in LAC or among Latino populations living in developed countries include arthritis, diabetes (Barceló et al. 2006) and hypertension. For example, using data from SABE, Al Snih, Ray and Markides (2006) showed that the rates of self-reported arthritis among adults aged 60 and older ranges from 24 per cent in Mexico City (Mexico) to 56 per cent in Havana (Cuba). In comparison, Mexican-American adults aged 65 and older in the southwestern United States have a prevalence of 40 per cent. In all populations, after controlling for socioeconomic and health conditions, arthritis is associated with functional limitations with daily activities of daily living (such as walking, eating, bathing, dressing, getting in and out of bed and using the toilet). The odds of having functional limitations are doubled for those with arthritis compared to those without it. Similar results, although less substantial in dimension, are obtained for instrumental activities of daily living (such as making phone calls, shopping, or taking medicines).

Interestingly, in very recent work using both the SABE and PREHCO study, it has been shown that poor early health status is associated not only with self-reported diabetes and heart disease (Palloni 2008) but also with disability. The relation appears to be not only indirect (that is, increasing the risk of experiencing chronic conditions associated with disability) but also direct (Monteverde et al. 2008).

Aging in Mexico

Demography of Aging

Over the 20th century, the demographic transition in Mexico followed a familiar pattern of high mortality and high fertility, followed by declining mortality first and a subsequent decline in fertility. Three phases are recognized in the transition (Partida 1999, 2005). At pre-transition, there was a peak in mortality during the war of Mexican Revolution from 1910 to 1921, with

a slight decline in the size of the population. After the war, the first stage of the demographic transition started, with declining mortality and constant-high or slightly increasing fertility rates between 1945 and 1960. Fertility started to decrease in the decade of the 1960s and the second phase of the transition started in 1970 when fertility declines were quite evident and accelerated. The third stage of the process, when both fertility and mortality rates converge at low levels is expected to be complete in the first half of the 21st century. The annual rate of population growth was around 1 per cent through 1910, increased to 1.4 by 1921 and 1.7 in 1930, reaching 2.7 in 1950 and 3.5 by 1965. From this point, population growth rates declined rapidly, from 3.1 in 1970 to 2.3 in 1985, and returning full circle to 1.3 per cent in 2000. However, the total population went from 16 million people in 1921 to roughly 100 million people in 2000 (Partida 2006).

The pace of decline in mortality rates is quite remarkable, as it was in many countries of the Latin America region. In 1921, life expectancy at birth was 32.9 years, compared to 74.0 years in the year 2000, with the most accelerated gains occurring between 1942 and 1960 (Partida 2006). Mortality due to infectious diseases fell from 7.7 per 1000 in 1950 to 0.75

in 1990, while mortality due to chronic-degenerative diseases increased from 1.04 to 2.15 per 1000 in the same period (Castro et al. 1996). According to population projections from the Mexican National Population Council (CONAPO 2005), the per cent of population aged 60 and older is expected to grow steadily, from 6 per cent in the year 2000, to 15 per cent in 2027 (See Fig. 11.1). This 27-year pace is relatively fast compared to other developing and developed countries as mentioned above. By way of comparison, it will have taken the United States 70 years to achieve a similar percentage (in 2013), while it took Japan about 40 years (from 1947 to 1985) to reach similar levels.

The fast epidemiologic transition in Mexico is evident also in the main causes of death. Using data from the Mexican Ministry of Health based on death certificates, Ham Chande (2003) orders the causes of death according to their numerical importance. Although caveats apply regarding the quality of the data on causes of death, this examination nevertheless illustrates the decline in infectious diseases and the emergence of chronic conditions as main causes of death among adults over the period 1970–2000. For example, among men aged 65 and older, while heart disease remains as the main cause of death throughout

Per cent of Population Aged 60+ and 0-15 in Mexico for Male, Female and Total Population

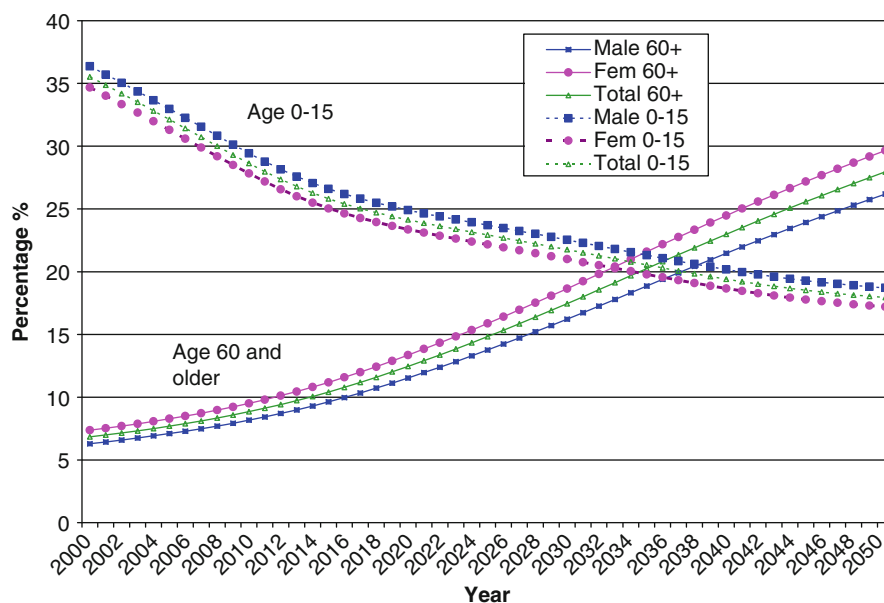


Fig. 11.1 Projected share of total population by young and old age in Mexico 2000–2050

Source: Population Projections from the Mexican National Population Council (CONAPO), 2005.

the period, pneumonia and influenza lose importance, moving from 2nd cause of death in 1970, to 3rd in 1980, 5th in 1990 and 7th in 2000. Similarly, intestinal infections move from 3rd in 1970, to 9th in 1980, 11th in 1990 and 13th in 2000. Diabetes mellitus gains importance, moving from 8th in importance in 1970, to 3rd by the year 2000, while accidents moved from 11th to 5th in importance over the 1970–2000 period.

Historical Context of Current Aging

The historical context of the 20th century set the general stage for the aforementioned epidemiological and demographic transitions and for the well-being of the current elderly. The current cohorts of adults aged 50 or older were born roughly between 1900 and 1950. These cohorts are survivors of a revolutionary war from 1910 to 1921, and secured basic rights to Mexican citizenship when the (still ruling) Constitution was approved in 1917. Among these rights was basic education and the Ministry of Education was created in 1921. Starting around 1930 there were gains in literacy rates, particularly among those in rural areas (Ham Chande 2003). Still, in 1943, the general literacy rate was about 50 per cent, compared to 90 per cent in 2000. In 1950, just 17 per cent of Mexican dwellings had running water available; this reached 88 per cent in 2000. The Mexican Social Security Institute (IMSS) was created in 1943, offering old-age and disability pensions to workers in the formal labor market, while the equivalent institution for federal workers (ISSSTE) was created in 1959. Around the same time, state-level and other decentralized organizations launched their social security systems, such as the Oil Company (PEMEX), Electricity, Railroad Company, the Army, Central Bank and others (Montes de Oca 2001). All these institutions initially covered urban population and offered health care services as well as old-age pensions to their beneficiaries. The uninsured population has traditionally been taken care of by the Ministry of Health, also created in 1943, which provides care to those in the informal labor market, the unemployed and those out of the labor force. All of these institutions of the health care system contributed to the major gains in mortality experienced in the second half of the 20th century.

More recently, the Mexican government has launched a series of reforms and experimental programs that may have an impact on the well-being of the elderly in significant ways. For example, a feature of the anti-poverty program “Oportunidades” (formerly “Progresa”), originally targeted to children, now includes cash assistance to the elderly. The program aims to improve the living conditions of older adults in households of extreme-poverty that participate in Oportunidades. The program selects localities where the poorest households are more likely to be found and then selects the poorest households within the localities (Skoufias et al. 1999). Elderly supplements go to participating households with elderly members. The first financial transfer from Oportunidades was made in early 2006, when 360,000 adults aged 70 or older received a cash transfer. Almost 75 per cent of the recipients lived in small rural communities of 2,500 people or less. The cash transfer is given every two months, conditional on the older adult getting health check-ups every 6 months. The amount is 250 pesos (about \$25 US dollars) per month per elderly and the payment is made to the Oportunidades household in addition to other anti-poverty payments (for children, for example). By the end of 2006, the program met the goal of reaching the approximately 970,000 elderly living in all Oportunidades households. Another program of the Mexican government policies is a cash transfer to the elderly given (without means test) to every resident aged 70 or older of the Federal District starting in 2001–2002. The recipient must show proof of age and residence in the Federal District for the previous three years. This is a flat benefit of 600 pesos (about 60 US dollars) per month. The program started distributing the cash benefit to 250,000 elderly, with a goal to reach all 325,000 age-eligible persons by the end of 2006. A handful of other states have started similar programs on an experimental basis.

Another reform started in the health sector. In 2003, a structural reform was launched, with the goal of offering publicly provided health insurance to the 50 million poor Mexicans not covered by social security. This new system of social protection of the poor operates through a “seguro popular” (popular health insurance); it was passed into law in 2003 and began operating in 2004 (Knaul and Frenk 2005). From the beginning, the system has included a package of high-cost tertiary-level services and has focused on cancers, cardiovascular problems, cerebro-vascular disease,

severe injuries and long-term rehabilitation, all of which disproportionately affect older adults. The system works through a three-pillar system to which affiliated families, the state governments and the federal government each contribute per affiliated household. By the end of 2006, an estimated 4 million families were affiliated (Knaul et al. 2007). The impact of these programs is unknown, as it is still too early for an evaluation of health or poverty outcomes.

Despite these recent attempts to improve well-being of the Mexican elderly, the social and political context in which aging of the population is taking place offers two overriding concerns. First, the social order in which the well-being of the elderly depends on the younger generation is gradually shifting due to a rapid fertility decline and a transformation in living arrangements. Unlike in developed countries, where traditional living arrangements changed prior to aging, these transformations and population aging are simultaneous in Mexico (DeVos and Palloni 2002). Second, aging is occurring in an environment in which the proportion of population protected by public health and social security systems has been traditionally limited (Cutler et al. 2000). According to the 2000 Mexican Population Census, about one-half of the population aged 65 or older reported to have no health-care-coverage, while only about one-fifth were receiving an old-age pension (INEGI 2000). Most recent reforms include a move towards privatization, likely to further reduce access to social protection, while including public components to protect the poorest (Cruz-Saco and Mesa-Lago 1998; Klinsberg 2000; James et al. 2003). These are still in progress and evaluations of their impact and sustainability are still premature. Thus, the highly compressed aging process in Mexico is likely to take place under a regime of weak economic performance with deep inequality between urban and rural populations, under changing intergenerational relations and fragile institutional contexts.

In what follows, we describe the Mexican older adults according to several socioeconomic, health and family support dimensions. Unless otherwise specified, we use results that we have reported elsewhere, or that were reported by other researchers, using the Mexican Health and Aging Study (MHAS). This is a prospective panel of individuals aged 50 and older in Mexico, with representation in national, urban (defined as areas with 100,000 people) and non-urban (hereaf-

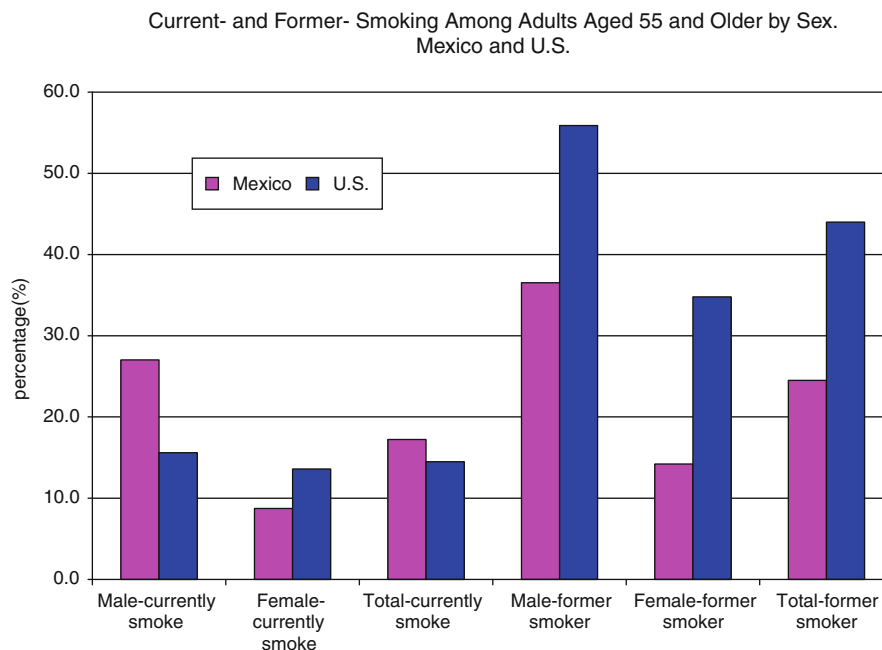
ter referred as rural) areas. The baseline survey was completed in 2001, with a follow-up in 2003 (Wong et al. 2007; ENASEM 2004).

Socioeconomic Characteristics of Current Older Adults

According to 2000 estimates, there are 14 million older adults (aged 50 or more) in Mexico. They are survivors of mixed mortality regimes, witnessed rapid epidemiologic and fertility changes and have attributes consistent with the historical context outlined above. These are cohorts with low educational achievement, who lived their reproductive years over periods of predominantly high fertility and have long working careers. Slightly over half are women (53 per cent), slightly over half are aged 60 or older and almost half (45 per cent) live in urban areas (with more than 100,000 people). About one-quarter of the women are widowed compared to 9 per cent of the men. Over two-thirds of older adults have four or more children-ever-born and 6 per cent declare that they have none. Approximately one-third has no years of formal education and one-fifth has 7 or more years of education. About 8 per cent report that they live alone, 55 per cent live in nuclear households and about one-third live in extended households. One in six (14 per cent) men and 3 per cent of women were at some time migrants (lived or worked) in the United States, while 40 per cent declare that they have never lived in a community different than their community of residence (Wong et al. 2007).

The socioeconomic divide by area of residence that characterizes Mexico is evident among older adults as well. In contrast to their urban counterparts, rural older adults have lower levels of education, are more likely to be married and are less likely to have ever migrated. About 83 per cent of rural older adults have less than 6 years of formal education, compared to 50 per cent of those living in urban areas. In rural areas 71 per cent declare that they have 5 or more living children, compared to 50 per cent of those who reside in urban areas. (Wong et al. 2007). Virtually all men (98 per cent) have worked for pay at some time over their life, compared to 65 per cent of the women. Regarding current employment, 57 per cent of rural and 45 per cent of urban men are currently employed; the

Fig. 11.2 Unadjusted current and former smoking among older adults by sex in Mexico and U.S.



Source: Wong, Ofstedal, Agree and Yount (2008), using MHAS 2001 and HRS 2000.

comparable figures for women are 15 per cent in both urban and rural areas (Wong and DeGraff 2007).

Main Health Behaviors and Risk Factors

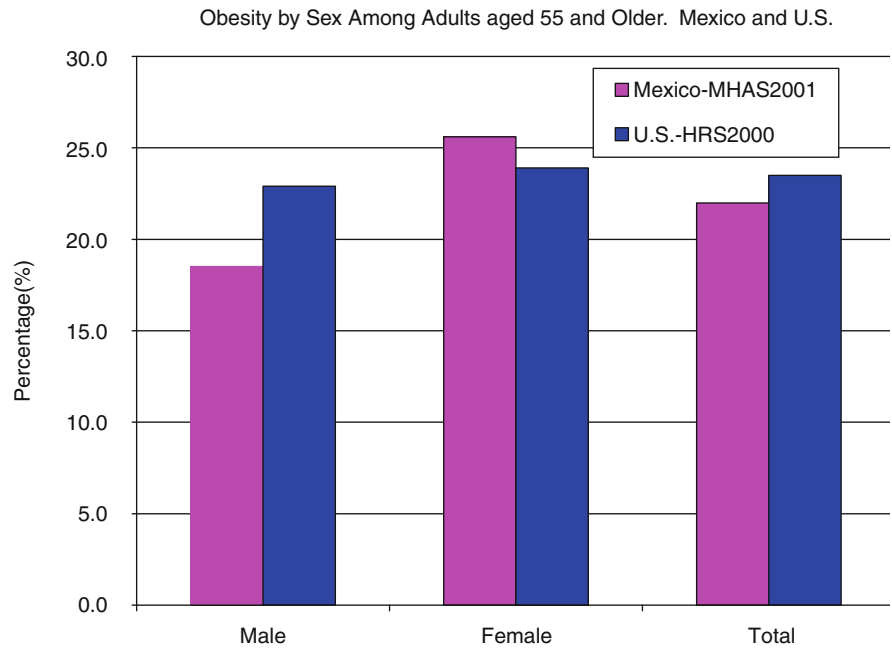
As mentioned above, the early-life conditions of older adults in Mexico is likely to have important effects on the burden of aging for Mexico. However, not only will the socioeconomic and health disadvantage of their childhood have consequences for old age but so also will the lifestyle and risk factors experienced during their life course. Data from the Mexican National Health Survey (ENSA) 2000 shows that the number of those currently smoking is relatively high compared to levels in developed countries among older adults but this holds only for men. Among men aged 60–69, 25.5 per cent report that they currently smoke, compared to 7.5 per cent of women. Similar to developed countries, current smoking is less prevalent among older adults compared to younger ones; 18.6 per cent of men and 5 per cent of women aged 70–79 are current smokers, whereas 16.4 per cent and 4.8 per cent of those aged 80 and older smoke (Olaitz et al. 2003).

Figure 11.2 compares the rates of smoking of older adults in Mexico and the U.S. and illustrates the

lagged stage of tobacco smoking transition that Mexico is undergoing relative to a developed country. Even though the proportion of current smokers among older adults is similar in both countries, around 17 per cent, the gender differences reveal interesting patterns of lifestyle transitions. A higher share of men smoke in Mexico than in the U.S., whereas a higher proportion of women smoke in the U.S. than in Mexico. However, in relative terms, there are more former smokers in the U.S. than in Mexico, indicating a more advanced stage of tobacco transition for the U.S., at least for men (Wong et al. 2008).

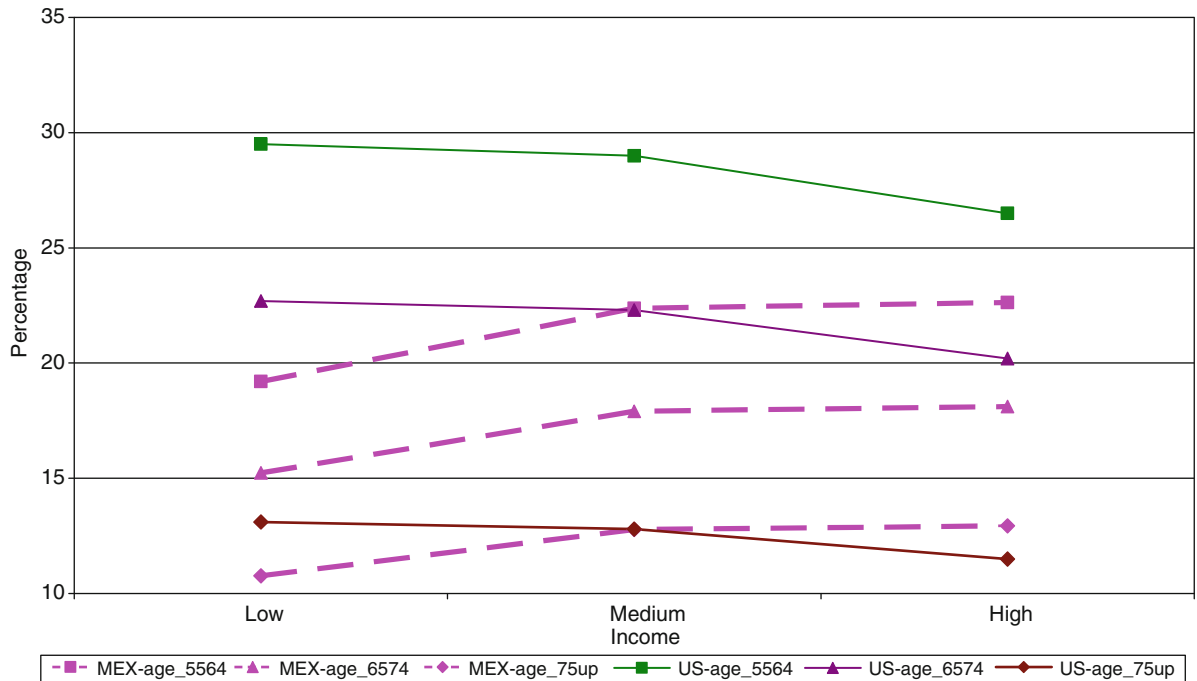
Figure 11.3 shows the prevalence of obesity among older adults in Mexico and the U.S. The levels are quite similar between the two countries (around 23 per cent) but men are less likely to be obese in Mexico while women are more likely to be obese in Mexico, compared to the U.S. This pattern seems indicative of a nutrition transition among older *men* when we compare the two countries. Figure 11.4 shows the predicted probabilities obtained from logit regressions of obesity among men, controlling for demographic attributes, social support, health insurance and socioeconomic influences in early life. The patterns by age show that younger cohorts are more likely to be obese than older cohorts in both countries. However, the figure also illustrates that high income is associated with

Fig. 11.3 Unadjusted obesity among older adults by sex in Mexico and U.S.



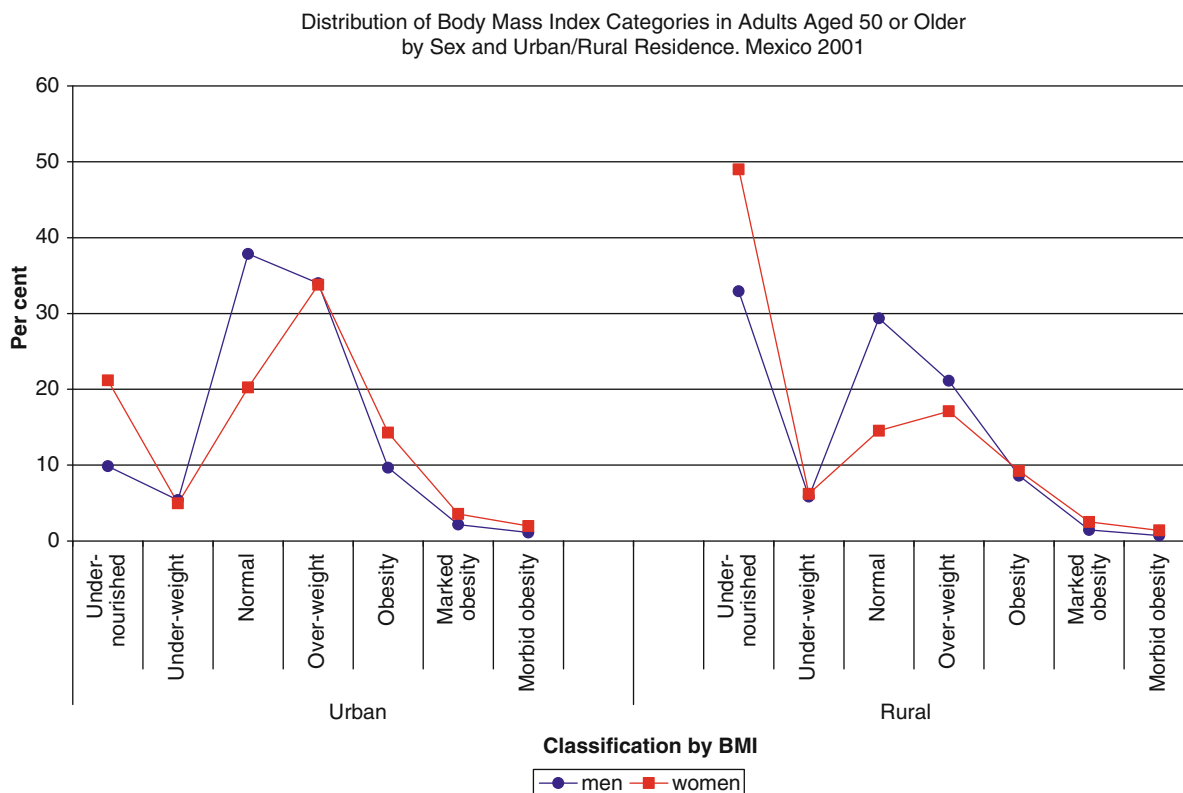
Source: Wong, Ofstedal, Agree & Yount (2008) using MHAS 2001 and HRS 2000.

Predicted Probabilities of Obesity by Income and Age
MEN - Mexico and U.S.



Source: Wong, Ofstedal, Agree & Yount (2008) using MHAS 2001 and HRS 2000.

Fig. 11.4 Adjusted prevalence of obesity by income and age groups. Men aged 55 and older (Mexico and U.S.)



Source: Authors' representation of results presented in Wong, Espinoza & Palloni (2007), using data from MHAS 2001.

Fig. 11.5 Unadjusted distribution of older adults according to categories of body mass index by sex and area of residence (Mexico)

higher obesity in Mexico but with lower obesity in the U.S. (Wong et al. 2008).

In addition to rising obesity, the nutrition of older adults in Mexico presents a mixed picture, which is consistent with having undergone rapid urbanization but still being a developing economy (Rivera 2004; Rivera et al. 2002). Figure 11.5 shows that among adults aged 50 and older, low nutrition levels are high but overweight and obesity are also apparent. Obesity is more prevalent among those in urban areas, whereas under-nourishment is more prevalent in rural areas. For example, in rural areas 49 per cent of women and 33 per cent of men report a body mass index consistent with malnourishment. In the urban areas these figures are 21 and 10 per cent respectively. On the other hand, 20 per cent of urban women and 13 per cent of urban men are obese, compared to 13 per cent of women and 11 per cent of men in rural areas (Wong et al. 2007).

The obesity contrast by gender among older adults in Mexico remains in even the oldest cohorts. According to ENSA 2000 data, about 23 per cent of men

and 36 per cent of women aged 60–69 are obese, compared to 15 per cent of men and 27 per cent of women aged 70–79 and 10 per cent of men compared to 17 per cent of women aged 80 and older. These patterns of obesity and the fact that among adults aged 60 or older obesity is more prevalent in urban areas and among those with more education are consistent with an early stage of the nutrition transition. Indicative of this stage, adoption of a sedentary lifestyle and processed-food, fat-rich diet is most common among those in urban areas and those with higher purchasing power in Mexico. As the transition progresses, these groups are expected to be the first to abandon this lifestyle when knowledge about the benefits of exercise and healthy foods expands (Popkin, 1994, 2002). Obesity is correlated with main chronic and debilitating conditions. Controlling for age, sex and education, self-report of hypertension and long-distance walk limitation are associated with obesity, while smoking is inversely related to obesity among Mexican older adults (Ruiz-Arregui et al. 2007).

The high prevalence of obesity and diabetes is notable among older adults in Mexico, as is the case for several other countries of Latin America, particularly in urban centers of the region (Palloni et al. 2006). Even if the high prevalence was originally largely due to adoption of an urban/westernized lifestyle, a continued increase in the prevalence starting in childhood will represent a harsh burden on the health system of Mexico. Over the next half-century, one of the greatest challenges for the health of the elderly will most likely be related to the prevention of obesity and related diseases, particularly diabetes.

Health and Disability Among the Elderly in Mexico

The self-report of global health among older adults is a useful and reliable measure of population health in developed countries, as it is a single indicator, easy to obtain in population surveys and predicts mortality among older adults (Power and Matthews 1997; Smith 1999). The indicator appears to have analytical potential among Mexican older adults also (Smith and Goldman 2007; Wong et al. 2005; Wong 2003). It is closely associated with the self-report of other conditions, such as diabetes, cancer, heart and lung disease and with having limitations with activities of daily living (such as bathing, eating, walking, using the toilet and getting out of bed) as well as instrumental activities of daily living (Barrantes-Monge et al. 2007). For example Wong (2003) found that among older adults who report having at least one chronic condition (such as cancer, lung disease, heart disease or stroke), compared to those who self-report “fair health,” twice as many report “poor health” and only one-third as many report “good” or “very good/excellent” health. Self-reported health is worse among women than men, among older individuals compared to younger and among those in rural areas than in urban. Among those aged 50 and older, 21 per cent of rural women and 13 per cent of urban self-report that their health is poor. For comparable men the figures are 19 and 11 per cent respectively. However, the self-report of chronic health conditions such as stroke, cancer, lung, or heart disease is relatively low in rural areas compared to urban (Wong et al. 2007). These patterns may be due to the relatively low contact of the population with the health system

in rural areas, which reduces the chances of medical diagnosis of certain chronic conditions.

Health status among older adults in Mexico show significant and definite gender differences. And although the self-report of global health among older adult women is worse at any given time than that of men, the *deterioration* in health is more rapid among men than women (Wong and Palloni 2006). The faster deterioration for men could be partly related to the marked differences in lifestyle and health behaviors mentioned above. Older men smoke tobacco and drink alcohol heavily to a larger extent than older women and these behaviors may help explain the higher mortality among men than women as well. Older women tend to use health care services (for preventive and curative care) to a larger extent than men, which may contribute to their higher awareness of health problems and the corresponding worse self-reported health relative to men (Wong et al. 2006). On the other hand, men have a more physically active lifestyle than women, contributing perhaps to a higher prevalence of obesity among women compared to men. One of the main correlates of obesity, diabetes, is quite prevalent among older adults in Mexico. Almost one in five adults aged 50 or older reports having diabetes. Of those aged 60 and older in urban areas, 18 per cent of men and 23 per cent of women report the condition. Similarly, 12 per cent of men and 15 per cent of women in rural areas state that they have the condition. Another correlate of obesity, hypertension, is quite prevalent as well. Among those aged 60 and older, 36 per cent of urban and 30 per cent of rural men report the condition, compared to 55 and 45 per cent of comparable women (Wong et al. 2007).

Similar to what has been reported for other countries, health and socioeconomic attributes seem closely related among Mexicans. These results confirm the deep divide also existing in terms of health between the wealthy and educated in Mexico and the rest of the population. A straight-forward multivariate analysis of self-reported health that includes age, marital status, sex, education, urban/rural residence, income and assets revealed that having high level of assets (being in the wealthiest tercile) is associated with better health. Having high income and more years of education are also associated with better health. In addition, worse health was associated with being female, being older, living in a rural area and being widowed (Wong 2003; Smith and Goldman 2007). Worth mentioning is that the relationship between

health and socioeconomic status is non-linear, with good health being a trait particularly of those at the highest end of the distribution in terms of income, assets, or education. For example, *ceteris paribus* the probability of reporting good health is higher by 50 per cent among those who have 7 or more years of education, compared to those who have no education. Also for Mexico, the self-report of poor health at the baseline associates strongly with mortality by two-year follow-up (Wong and Palloni 2006).

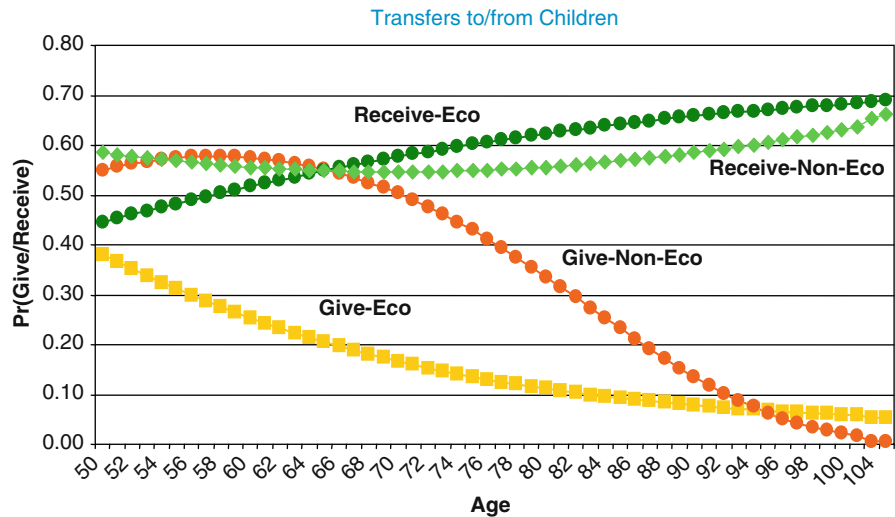
Aging and the Culture of Family Support

Patterns of co-residence and filial support in Mexico are suggestive of a society in which the elderly and their children are quite co-dependent. The majority of older adults in Mexico share residence with their children, a commonality with the rest of Latin America in general (Ybáñez-Zepeda et al. 2005). With older age, co-residence with unmarried children falls; towards the last stages of the life cycle, married older adults tend to live with their spouse or partner; those without a spouse tend to live with their children. Results confirm that older adults with functional limitations (with basic or instrumental activities of daily living such as eating, bathing, walking, taking medications, or shopping) tend to co-reside with married children. In addition to a strong association with marital status, co-residence with children among older adults varies by area of residence. Co-residence with children is slightly more prevalent in urban areas compared to rural, which may be due to the cost of living or the availability of children. While, on average, those living in rural areas have more living children than those in urban areas, emigration of young adults from rural areas may imply that there not enough available children to co-reside with the elderly parents. Data from the MHAS shows that, among unmarried older adults aged 70–79 in rural areas, about 20 per cent live with married children and 38 per cent live alone. In contrast, in urban areas, 18 per cent of comparable unmarried older adults live with married children and 32 per cent live alone. Older women more than men tend to live with their children. Among unmarried persons aged 50 or older for example, 60 per cent of women live with children, compared to 44 per cent of men (Ybáñez-Zepeda et al. 2005).

Patterns of private assistance or transfers between children and adult parents in Mexico reveal a society in which flows of transfers are common in both directions (parent-to-child and child-to-parent). However, more transfers occur from adult children to parents, which contrasts what is observed in the U.S. MHAS data reveal that among adults aged 50 and above, the propensity to *receive* monetary help from children is quite prevalent (53 per cent) compared to those who report *providing* this kind of help to their children (23 per cent). One important feature of the patterns of exchange is that in addition to *monetary* help, older adults report giving (44 per cent) and getting (48 per cent) *non-monetary* help in exchanges with their adult children. This *non-monetary* exchange is defined as help with such things as personal care, chores and child-care. Controlling for demographic, economic, health, disability and living arrangement factors, these patterns are more common among women than men; as individuals age from middle- to old-age, receiving help from children appears increasingly dominant over giving. In particular, at all ages above 50, the propensity to *receive* economic help is higher than to *give* help. With respect to non-economic help, the propensity to give is only slightly higher than to receive up to age 70. After about age 70, *receiving* help becomes dominant. As Fig. 11.6 shows, with both types of help, the gaps between giving and receiving are wider at higher ages in favor of receiving help (Espinoza and Wong 2004).

Consistent with research findings for developed countries, flows of assistance in Mexico seem non-persistent, responsive to deterioration and improvement in health and not driven simply by cultural norms or older age. Figure 11.7 illustrates how the system of exchange between older adults and their children seems quite dynamic over a two-year period. For example, among the older adults *not* receiving economic assistance from their children in 2001, 29.8 per cent switched to receiving such help in 2003. Similarly, among those who in 2001 reported receiving non-economic assistance in 2001, 49 per cent switched to *not* receiving such help in 2003. The last two bars show that, among those giving help in 2001, 70 per cent are *no* longer giving economic help in 2003 and 53 per cent switched to *no* longer giving time to help their children. Furthermore, the evidence shows that shifts in and out of exchanges of help between older adults and their children is sensitive to economic and health factors and varies by type of

Fig. 11.6 Adjusted propensity to give and to receive monetary and non-monetary help. Adults aged 50 and older (Mexico)



Source: Espinoza & Wong (2004) using data from MHAS 2001.

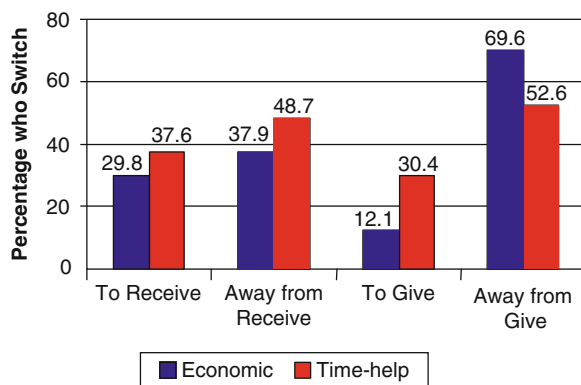
help. The wealthiest (those in the upper 30 per cent tail of the net-worth distribution) have reduced odds of becoming a recipient and increased odds of becoming a donor of economic help. On the other hand across the two-year period, as functionality problems increase (with basic or instrumental activities of daily living), chances are higher of becoming a recipient of in-time help from children. Overall this research confirms “non-persistence” of help, characterized by intermittent, responsive to needs, flows between older adults and their children in Mexico (Wong and Higgins 2007).

Institutional Support

According to estimates for 2002, about two-thirds (59.9 per cent) of the total population in Mexico lacks health insurance. The main institution providing coverage is the IMSS (Instituto Mexicano del Seguro Social), covering 29.5 per cent of the population, largely those in the formal labor market. Private insurance services are used by 1.5 per cent (Puentes-Rosas et al. 2005: S22). The rest of the provision of services is largely in the hands of the public sector, funded by general government revenues to pay for care of middle- and low-income groups. Private pharmacies are a major source of informal care; pharmacists generally prescribe medicines and treatment in Mexico. Health care services cover older adults only if they are affiliated to a social security or private system through current employment, or if they are retired and used to be affiliated to a public health system, or if they have an affiliated relative claiming them as elderly dependent. There is no old-age health insurance in Mexico comparable to Medicare in the United States.

The pro-family feature of the health system may provide added protection to older adults in Mexico, because notwithstanding the low health care coverage of the Mexican population overall, in relative terms older adults appear to have an advantageous position. In a comparative study of health insurance coverage across age groups, Wong and Figueroa (1999) found

2001-2003 Switches in Transfer Flows
Patterns of 2001-2003 transfer switches by type



Source: Wong and Higgins (2007) using MHAS 2001 and 2003 data.

Fig. 11.7 Dynamics of economic and non-economic transfers among older adults and their children (Mexico)

that older adults are more likely to have insurance and use health care services than younger adults. This is confirmed with MHAS data; adults age 60 and older are more likely to have health insurance coverage than those age 50–59. In urban areas, 77 per cent of men and women aged 60 or older have coverage, compared to 65 per cent of men and 73 per cent of women aged 50–59. The largest gap remains between rural and urban older adults, with only 38 per cent of rural older adults having health insurance (39 per cent of men age 60 and older compared to 33 per cent of men aged 50–59).

The large gaps in health insurance coverage and in use of health care services across population groups – in particular between rural and urban areas – not surprisingly, plays a major role. In a multivariate analysis of use of health care services, Wong and Diaz (2007) used MHAS data to find that use of preventive services, curative services and hospitalizations are closely associated with availability of insurance among older adults. After controlling for age, health conditions, education, income and marital status, a large gap continued to exist between those who have and do not have health insurance coverage in the three types of services. Once the availability of health insurance was controlled for, relatively small differences in use of services between urban and rural residents remained but only for preventive care. Older women were more likely to use health services than comparable men but only preventive care and hospitalizations.

Inequality and Poverty in Old Age

A concern in aging societies is the financial vulnerability in the absence of old-age income security or institutional support, as is the case in many poor countries. If labor is the main source of income in these societies, then, in the absence of old-age entitlements, as individuals reach non-productive age their economic vulnerability increases.

Institutional coverage for old-age financial support is scarce in Mexico. In urban areas, 45 per cent of men aged 60 and older have an old-age pension, compared to 39 per cent of women. The comparable figures for rural areas are 16 per cent for both men and women. These percentages include widowhood and retirement

pensions and widowhood benefits improve the position of women substantially.

Despite poor institutional coverage among older adults in Mexico, in relation to the rest of the population, older adults seem to be in good position. With the large caveat that only a small fraction of Mexicans have social security and health care coverage, the pro-family orientation of social systems appear to offer relatively advantageous protection to these cohorts of older women. Overall, they were extended health and old-age pension benefits throughout their lifecycle as dependents of a covered worker, due to their social role as daughters, wives, widows and subsequently widowed mothers. Paradoxically, the generalized dependent status appears to have rendered them a relatively advantageous position in terms of health and old-age protection compared to older men. Thus in relative terms, compared to young adults for example, the current elderly enjoy an advantageous situation. Nevertheless, this situation is based on an informal social contract among family members, which is difficult to enforce or regulate.

Lack of institutional support in Mexico is also evident in the sources of income for older adults. Using MHAS data for 2001, Wong and Espinoza (2003) considered the income and assets of older adults and their spouses/partners, to examine the sources and levels of income and wealth for persons aged 50 and older. Almost one-in-six (14 per cent) older adults declared that they receive no income. For the remaining 86 per cent, the most common sources are: labor (42 per cent), family help (34 per cent) and pensions (25 per cent). Of the total population aged 50 or older, almost one-quarter (26.5 per cent) declared that their only source of income was labor, while 28 per cent received labor and some other source of income. One-tenth of the population (9.9 per cent) declared family help as their only source of income and 8 per cent declared pensions as the sole source. The *level* of income, as expected, is higher for younger groups (age 50–59), who on average report almost twice (1.7 times) the income reported by those aged 70 and older. Among older cohorts, labor income is a smaller share of their total income, while family help represents a larger share. For example, for those aged 70 and older, family help represents on average 35 per cent of their total income, while it is only 9 per cent of the total income of those aged 50–59 (Wong and Espinoza, 2003: 142).

Personal wealth is a highly important indicator of economic well-being in old age, in particular in countries like Mexico, where labor income represents a large share of the total income received by households. The patterns of wealth distribution, the types of assets that older adults hold and the options available for accumulation of assets to finance old-age can have vast implications on the well-being of older adults. Analysis of the total value of assets from MHAS among persons aged 50 and older (including the wealth of their spouse/partner if they have one), reveals that the majority of older adults (76 per cent) report that they have housing wealth and only 8 per cent report no assets. Housing is the principal source of their wealth (on average, the home represents 60 per cent of the total); this share is quite consistent across age cohorts, genders, rural/urban residence and education groups. Only 6 per cent of total net worth is in the form of financial assets; even for the highest education group (those with 7 or more years of education) this fraction reaches only 10 per cent on average. This distribution of wealth contrasts with findings for developed countries with mature financial markets. In the United States, for example, Smith (1995) reported that on average, about 30 per cent of total assets among adults aged 51–61 in 1992 was in the form of homes and 30 per cent was in financial assets.

The absolute value of net worth in Mexico is lower for those aged 70 and older in comparison with those under 70. Similar to income, net worth is associated positively with education and the distribution is quite skewed. Those with 7 or more years of education report 4 times the median net worth of those with 0 years of formal education. Although both income and net worth are highly skewed, the distribution of wealth is more equitably distributed than income (Wong and Espinoza 2003: 160). This summary of sources of economic support implies that older adults in Mexico hold most of their assets in homes, a non-liquid form. Thus, their options to finance a catastrophic health care expense, for example, may be severely limited. Income sources seem both few and quite skewed; thus other sources of support such as family members may be of relevance. One of those options, which became increasingly common over the last half of the 20th century, is remittances from Mexican migrants in the United States.

The MHAS cohorts are Mexicans born in 1951 or earlier (roughly between 1900 and 1950). These cohorts experienced the important “bracero program,” a tem-

porary workers program that functioned between 1942 and 1964 in the U.S. Most of these migrants were young men coming from rural areas of western Mexico and would work temporarily as agriculture, construction or railroad workers. Those who are return-migrants, back in Mexico, are more likely to have relatives (parents, siblings, or children) who are or were U.S. migrants themselves, thus establishing among many families and communities a culture of U.S. migration as a means of economic support. Among adults aged 50 and older in Mexico, 14 per cent of men and 3 per cent of women declare that they are former migrants in the United States (that is, they went to the United States to live or work at some time in their life). And one-in-five older adults, men or women, have at least one child who is currently a migrant in the U.S. Almost two-thirds of the male U.S. return migrants also had a parent or sibling who was a migrant, compared to one-third among those who never migrated to the U.S.

Although out-migration of young workers may produce further aging of the population in Mexico, remittances from the U.S. are a major source of support among Mexican households. In addition, the economic old-age consequences of migration may play a prominent role in old-age security for the migrant themselves. Wong et al. (2007) examined the role of past migration in current old-age wealth among adults aged 50 and older. The findings indicated that, despite the fact that migrants tend to be less-educated and less likely to have institutional coverage for health care in Mexico than non-migrants, having been a migrant in the U.S. is associated with higher cumulative wealth in the elderly. The authors concluded that, net of socioeconomic and demographic factors, as well as selectivity factors that pre-determine migration, former migrants have a significant advantage in net worth compared to those who never left for the U.S. The mechanisms for this advantage, however, are unclear. This could be due to the migrants’ own savings from the U.S. earnings, or because migrants accumulate experiences that could have high pay-offs upon their return in Mexico. Or it could be due to remittances from children who also went to the U.S. as migrants and allowed the accumulation of assets among the older adults. These patterns of migration, return migration and remittances between Mexico and the United States illustrate how, beyond the interdependence of economies, the aging processes of the two countries are closely linked as well.

Another feature of the inequality and poverty in Mexico, common to many countries in LAC, is related to the ethnic diversity of its people. Around the year 2000, slightly over one in ten (11 per cent) of the population was indigenous (defined as speakers of an indigenous language). For these groups the epidemiologic transition has lagged behind; indigenous populations tend to live in rural areas. In 1995, about 800 municipalities in Mexico were considered highly-indigenous, defined as having more than 70 per cent indigenous population. Of these, almost half (44 per cent) were classified as municipalities of extreme poverty. Although national studies representative of indigenous populations are scarce, a detailed study performed circa 1995 at the municipality level produced several overwhelming statistics. The study divided municipalities in 5 groups according to percentage of indigenous population. For those in the highest-indigenous group (with over 75 per cent of indigenous population), life expectancy for men was 8 years lower than the national estimate. These figures imply that the high-indigenous groups have life expectancy comparable to what the country registered for 1980, a lag of around 15 years. Poor access to health services may be the most important

determinant of poor health and mortality outcomes in indigenous groups, because these groups tend to live in remote, hard-to-reach areas. This is apparent from the high rates of mortality due to diarrheic infections, maternal health causes, respiratory infections and cardiovascular diseases reported for the groups (Torres et al. 2003). Thus Mexico is struggling to close the gap for its underprivileged and providing basic services for the poor and isolated is a significant short- and mid-range challenge.

Future of Aging in Mexico

A salient feature of contemporary Mexico is the advanced literacy and education of its population relative to the levels of recent past. Rural women who were aged 26–30 in 1970 had an average education of 2.3 years. In 2000 however, the rural cohort of the same age had an average of 6.1 years of education, an increase of 260 per cent over the 30-year period. Figure 11.8 shows the change in education between 1970 and 2000 in per cent, by sex, age and urban/rural residence. Across all age groups, the greatest gains

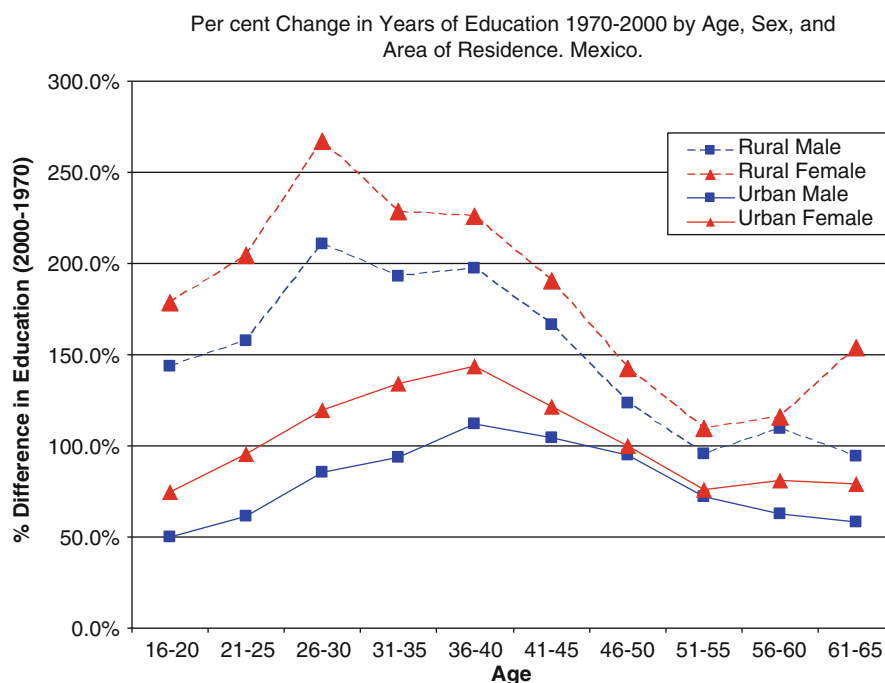


Fig. 11.8 Unadjusted 30-year change in years of schooling by age, sex, and area of residence (Mexico)

Source: Authors' calculations using data from the 1970 and 2000 Census. Mexico.

occurred in rural areas for both men and women but women's gains were the largest. The gains were relatively larger among younger groups. Thus the future elderly of Mexico will be dramatically better educated than the current elderly. They will have significantly more human capital in formal education; fewer children to support but also fewer children to provide them with social and economic support in old age. They will have participated more in the labor force throughout their life, particularly women and presumably will be better connected with the social and health sectors and thus protected by the social security systems that protect mostly those who participate in the formal labor markets. The future elderly will have enjoyed the benefit of preventive and curative medical advances during their childhood, lower exposure to infectious disease regimes, as well as longer exposure to urban services such as sanitation and health care, placing them in a clear advantage during old age compared to the current elderly. However, more Mexicans will also have endured the life style prevalent in urban environments, with relatively higher rates of smoking and obesity that currently prevail compared to those in rural areas.

To provide an idea of the future burden of tobacco smoking for old age health, we consider the current patterns and trends of smoking in younger ages. Franco-Marina (2007) examined the trends in smoking behavior in Mexico over the period 1988–2002. Among persons aged 18–65, although the prevalence of smoking continues to be higher among men than women, there was a falling trend among men and a slight increase among women. Men show a total reduction of 16 per cent between 1988 and 2002 and women show a comparable drop but then a slight increase during 1993–2002, particularly among women less than 30 years of age. The intensity of smoking also reveals that in 2002, women in Mexico who were daily smokers smoked on average more cigarettes than men (by 0.5 cigarettes) and women also represent a higher proportion of heavy smokers than men (Franco-Marina 2007). These results are consistent with the patterns found for the period 2000–2006, showing a significant decline in smoking for men but not for women. Research also shows that smoking in Mexico is still more prevalent among those living in larger cities, among those with higher wealth and among those with more years of education. However in Mexico, compared to developed countries today, smoking prevalence is high but the intensity of smoking is relatively

low. In 2002, the mean number of cigarettes among daily smokers is estimated at 6.4 per day (Villalobos and Rojas 2007; Franco-Marina 2007).

Rates of obesity for current children are quite high in Mexico. The national prevalence of overweight and obesity are estimated as 19.5 per cent among children ages 5–11 in a national survey circa the year 2000 (Hernandez et al. 2003), with higher prevalence in urban areas than in rural (27 per cent in Mexico City for example). The risk of obesity is higher for girls than for boys and is positively associated with maternal schooling, child's age and socioeconomic status. Unless a dramatic reversal in these patterns occurs, these childhood patterns may have long-lasting effects on the health of future generations of older adults as recent research suggests. The burden of disease and disability of the future elderly could be exacerbated by the current lifestyle of the youth and young adults in the urban areas of Mexico.

Conclusions

The region of Latin America and the Caribbean in general and Mexico in particular, face rapid population aging that will manifest fully in the next few decades. One of the important features of the context in which this accelerated aging will occur is the weak economic performance of the countries, which marks the aging process as premature for the level of economic development. The current generations of older adults still experience vast differences across men and women and between rural and urban areas. Those residing in urban areas generally have the advantage of greater access to sanitation and health services. However, urban residents also experience worse health behaviors and sedentary life styles.

Mexico has experienced major gains in education in recent decades as well and recent reforms are underway for the health care and social security systems. While these reforms are experimental and are expected to be further adjusted in the future, they indicate possible policies that could substantially improve the well-being of the older populations and the ability of future generations to support their own old age. However, Mexico and other economies in Latin America are still struggling to develop reliable financial markets, which is the backbone for both pension systems and the abil-

ity of individuals and families to save or invest for old-age support.

Looking ahead to the future elderly, Mexico has experienced tremendous gains in the education of its people, particularly for its women and rural populations. This additional education may represent an opportunity to gain in economic and health terms as well. With respect to lifestyle and health risk factors, it would be fortuitous if Mexico underwent accelerated transitions in smoking and nutrition compared to developed countries, for example, similar to the compressed demographic and epidemiologic transitions experienced in the past. This would facilitate the process of aging and would help reduce problems associated with chronic conditions and disability, such as older adults may experience in Mexico. Because aging is occurring prematurely, Mexico and the vast majority of economies in the LAC region still have the challenge of addressing the basic health care needs of the minority and rural populations. Consequently, the needs of the older adults in aging populations must compete for resources with the young and the poor. The globalization of economies may become increasingly a solution, as the case of Mexico reveals with its proximity to the U.S. and Canada. Countries in the north and south have become largely co-dependent, a situation unlikely to change as population aging proceeds in the region.

References

- Al Snih S, Ray L, Markides K (2006) Prevalence of self-reported arthritis among elders from Latin America and the Caribbean and among Mexican Americans from the southwestern United States. *J Aging Health* 18(2):207–223
- Albala C, Kain J, Burrows R, Diaz E (2000) *Obesidad: Un desafío pendiente*. Santiago, Chile: Editorial Universitaria, Universidad de Chile
- Barker DJP (1998) Mothers, babies and health in later life. Edinburgh, Churchill Livingstone
- Barrantes-Monge M, García-Mayo EJ, Gutiérrez-Robledo LM, Miguel-Jaimes A (2007) Dependencia funcional y enfermedades crónicas en ancianos mexicanos. *Salud Pública de México* 49(Suppl 4):S459–S466
- Barrientos A (1997) The changing face of pensions in Latin America: Design and prospects of individual capitalization pension plans. *Soc Policy Admin* 31(4):336–353
- Brea J (2003) Population dynamics of Latin America. *Popul Bull* 58(1)
- Castro V, Gómez-Dantés H, Negrete-Sanchez J, Tapia-Conyer R (1996) Las enfermedades crónicas en las personas de 60–69 años. *Salud Pública de México* 38:438–447
- CISS (2003) Evaluation of the reforms: The Americas Social Security report 2003. Mexico: Interamerican Conference on Social Security
- CONAPO (2005) *Envejecimiento de la población de México: Reto del siglo XXI*. México, Consejo Nacional de Población
- Costa D, Helmchen LA, Wilson S (2007) Race, infection and arteriosclerosis in the past. *PNAS* 104(33):13219–13224
- CRELES (2007) Descripción, costa rica: Estudio de longevidad y envejecimiento saludable (2007) Retrieved September 24, 2007 from <http://ccp.ucr.ac.cr/creles/descripc.htm>
- Crimmins EM, Finch CE (2006) Infection, inflammation, height and longevity. *PNAS* 103(2):498–503
- Cruz-Saco MA, Mesa-Lago C (eds) (1998) Do options exist? The reform of pension and health care systems in Latin America. University of Pittsburgh Press, Pittsburgh, PA
- Cutler D, Knaul F, Lozano R, Mendez O, Zurita B (2000) Financial crisis, health outcomes and aging: Mexico in the 1980s and 1990s (NBER Working Paper 7746). Retrieved October 8, 2007, from econpapers.repec.org/paper/nbrnberwo/7746.htm
- Cynader MS (1994) Mechanisms of brain development and their role in health and well-being. *Daedalus* 123(4):155–165
- De Vos S (1990) Extended family living among older people in six Latin American countries *J Gerontol* 45(Suppl 3): S87–S94
- De Vos S, Palloni A (2002) Living arrangements of elderly people around the world. (Working Paper, University of Wisconsin-Madison: Center for Demography & Ecology)
- Elo IT, Preston SH (1992) Effects of early-life conditions on adult mortality: A review. *Popul Index* 58(2):186–212
- ENASEM (2004) Documento metodológico de la encuesta 2001, Estudio Nacional de Salud y Envejecimiento en México. Retrieved October 8, 2007 from <http://www.mhas.pop.upenn.edu>
- Espinoza M, Wong R (2004) Intergenerational assistance in middle- and old-age in Mexico: Life cycle stages in a developing economy. In Population Association of America 2004 Annual Meeting, April 1–3, 2004. Boston: Population Association of America
- Finch CE, Crimmins EM (2004) Inflammatory exposure and historical changes in human life-spans. *Science* 305:1736–1739
- Fong IW (2000) Emerging relations between infectious diseases and coronary artery disease and atherosclerosis. *CMAJ* 163(1):49–56
- Franco-Marina F (2007) Adult smoking trends in Mexico: An analysis of the Mexican National Addiction Surveys. *Salud Pública de México* 49(Suppl 2):S137–S146
- Frenk J, Frejka T, Bobadilla JL, Stern C, Sepulveda J (1991) Elements for a theory of the health transition. *Health Transition Rev* 1(1):21–38
- Glaser K, Agree EM, Costenbader E, Camargo A, Trench B, Natividad J et al (2006) Fertility decline, family structure, and support for older persons in Latin America and Asia. *J Aging Health* 18(2):259–291
- Ham Chande R (2003) El envejecimiento en México: El siguiente reto de la transición demográfica. México, El Colegio de la Frontera Norte
- Hernandez B, Cuevas-Nasu L, Shamah-Levy T, Monterrubio EA, Ramirez-Silva CI, Garcia-Feregrino R et al (2003) Factors

- associated with overweight and obesity in Mexican school-age children: Results from the National Nutrition Survey 1999. *Salud Pública de México* 45(Suppl 4):S551–S557
- Hertzman C (1994) The lifelong impact of childhood experiences: A population health perspective. *Daedalus* 123:167–180
- INEGI (2000) *Estados Unidos Mexicanos: XII Censo General de Población y Vivienda*. Tabulated from the Muestra Censal. Mexico: Instituto Nacional de Estadística, Geografía e Informática
- James E, Cox Edwards A, Wong R (2003) The gender impact of pension reform. *Public Econ Finance* 2(2):181–219
- Kinsella K, Phillips DR (2005) Global aging: The challenge of success. *Popul Bull* 60(1)
- Kinsella K, Velkoff V (2001) *An aging world (US Bureau of the Census Publication)*. US Government Printing Office, Washington, DC
- Klinsberg B (2000) *América Latina: Una región en riesgo, pobreza, inequidad e institucionalidad social*. Inter-American Development Bank, Washington, DC
- Knaul FM, Frenk J (2005) Health insurance in Mexico: Achieving universal coverage through structural reform. *Health Aff* 24(6):1467–1476
- Knaul FM, Arreola-Ornelas H., Méndez-Carniado O, Torres AC (2007) Impoverishing and catastrophic household health spending among families with older adults in Mexico: A health reform priority. In: Angel JA, Whitfield KE (eds) *The health of aging Hispanics: the Mexican-origin Population*, Springer, New York
- Kuh D, Ben-Shlomo Y (eds) (2004) *A life course approach to chronic disease epidemiology*, 2nd edn. Oxford University Press, Oxford
- Lithell HO, McKeigue PM, Berglund L, Mohsen R, Lithell U, Leon DA (1996) Relation of size at birth to non-insulin dependent diabetes and insulin concentrations in men aged 50–60 years. *BMJ* 312:406–410
- Martorell R, Stein A, Schroeder D (2001) Early nutrition and later adiposity. *J Nutr* 131:874S–880S
- MHAS (2007) Data and documentation: Mexican Health and Aging Study. Retrieved September 24, 2007 from <http://www.mhas.pop.upenn.edu>
- Montes de Oca V (2001) Desigualdad estructural entre la población anciana de México: Factores que han condicionado el apoyo institucional entre la población de edad 60 y más. *Estudios Demográficos y Urbanos* 48:585–614
- Monteverde M, Noronha K, Palloni A (2008) Effects of early conditions on disability among elderly in Latin America and the Caribbean. Manuscript under review
- Olaiz G, Rojas R, Barquera S, Shamah T, Aguilar C, Cravioto P, López P, Hernández M, Tapia R, Sepúlveda J (2003) *Encuesta Nacional de Salud 2000, Tomo 2. La Salud de los Adultos*. Cuernavaca, Instituto Nacional de Salud Pública
- Omrán AR (1982) Epidemiologic transition. In *International encyclopedia of population*. The Free Press, New York, pp 172–183
- Palloni A (2001) Living arrangements of older persons. *UN Popul Bull* 42/43(Special Issue):54–110
- Palloni A, McEniry M (2007) Aging and health status of elderly in Latin America and the Caribbean: Preliminary findings. *J Cross Cult Gerontol* 22:63–285
- Palloni A, McEniry M, Davila AL, Garcia A (2007) Relation of early childhood conditions to health status in the elderly in Latin America and the Caribbean. Manuscript, Center for Demography and Ecology, University of Wisconsin, Madison
- Palloni A (2008) Health and life expectancies for Latin America and Caribbean aging populations. Paper presented at the Annual Meeting of the Gerontological Society of America, San Francisco, 16–20 November 2007
- Palloni A, McEniry M, Wong R, Pelaez M (2006) The tide to come: Elderly health in Latin America and the Caribbean. *J Aging Health* 18(2):180–206
- Palloni A, Peláez M (2002) Survey of health and well-being of elders, final report. Pan American Health Organization, Washington, DC
- Palloni A, Pinto-Aguirre G, Peláez M (2002) Demographic and health conditions of aging in Latin America and the Caribbean. *Int J Epidemiol* 31:762–771
- Palloni A, Soldo BJ, Wong R, McEniry M (2003) Health status in a national sample of elderly Mexicans. In *Population Association of America 2003 Annual Meeting*, May 1–3, 2007. Minneapolis: Population Association of America
- Palloni A, Wyrick R (1981) Mortality decline in Latin America: Changes in the structures of causes of deaths, 1950–1975. *Soc Biol* 28(3–4):187–216
- Parker SW, Wong R (2001) Welfare of male and female elderly in Mexico: A comparison. In *The Economics of Gender in Mexico*, Chap 8. The World Bank, Washington, DC
- Partida V (1999) *La revolución silenciosa: Descenso de la fecundidad en México: 1974–1999*. In *La Situación Demográfica en México*. CONAPO, México
- Partida V (2005) La transición demográfica y el proceso de envejecimiento en México. *Papeles de Población*, 45:9–27
- Partida V (2006) Demographic transition, demographic bonus and ageing in Mexico. *Proceedings of the United Nations Expert Group Meeting on Social and Economic Implications of Changing Population Age Structures Mexico*, D. F.: National Population Council, pp 285–387
- Popkin BM (1993) Nutritional patterns and transition. *Popul Dev Rev* 19:138–157
- Popkin BM (1994) The nutrition transition in low-income countries: An emerging crisis. *Nutr Rev* 52(9):285–298
- Popkin BM (2002) The shift in stages of the nutrition transition in the developing world differs from past experiences. *Public Health Nutr* 5:93–103
- Power C, Matthews S (1997) Origins of health inequalities in a national population sample. *Lancet* 350(9091):1584–1589
- PREHCO (2007) Documentation, Puerto Rico: Condiciones de salud de los adultos de edad mayor. Retrieved September 24, 2007 from <http://prehco.rcm.upr.edu>
- Preston SH (1976) Mortality patterns in national populations with special reference to recorded causes of death. Academic Press, New York
- Puentes-Rosas E, Sesma S, Gómez-Dantés O (2005) Estimación de la población con seguro de salud en México mediante una encuesta nacional. *Salud Pública de México* 47(Suppl 1): S22–S26
- Reyes-Ortiz CA, Ostir GV, Peláez M, Ottenbacher KJ (2006a) Cross-national comparison of disability in Latin American and Caribbean persons aged 75 and older. *Arch Gerontol Geriatr* 42:21–33
- Reyes-Ortiz CA, Camacho ME, Amador LF, Vélez LF, Ottenbacher K, Markides KS (2006b) Education, literacy, and can-

- cer screening among Latin American and Caribbean older adults. *Cancer Control* 14:388–395
- Rivera JA (2004) Nutrition transition in Mexico and other Latin American countries. *Nutr Rev* 9:149–157
- Rivera JA, Barquera S, Campirano F, Campos I, Safdie M, Tovar V (2002) Epidemiological and nutritional transition in Mexico: Rapid increase of non-communicable chronic diseases and obesity. *Public Health Nutr* 5(1):113–122
- Ruggles S (1996) Living arrangements of the elderly in America. In: Hareven T (ed) *Aging and generational relations over the life course: A historical and cross-cultural perspective* Walter de Gruyter & Co, New York, pp 254–271
- Ruiz-Arregui L, Castillo-Martínez L, Orea-Tejeda A, Mejía-Arango S, Miguel-Jaimes A (2007) Prevalence of self-reported overweight-obesity and its association with socioeconomic and health factors among older Mexican adults. *Salud Pública de México* 49(Suppl 4):S482–S487
- Ruiz-Pantoja TE, Ham-Chande R (2007) Factores sociales y salud infantil asociados con la vejez. *Salud Pública de México* 49(Suppl 4):S495–S504
- SABE (2007) Description & citation—study no. 3546: Salud y bienestar en el evejecimiento. Retrieved September 24, 2007 from <http://www.icpsr.umich.edu/cocoon/NACDA/STUDY/03546.xml>
- Scrimshaw NS (1997) Nutrition and health from womb to tomb. *Food Nutr Bull* 18(1):1–19
- Schaffer RH (2000) The early experience assumption: Past, present, and future. *Int J Behav Dev* 24(1):5–14
- Schroeder DG, Martorell R, Flores R (1999) Infant and child growth and fatness and fat distribution in Guatemala. *Am J Epidemiol* 149(2):177–185
- Sinha T, Yanez M (2007) A decade of government mandated privately run pensions in Mexico: What have we learned? In: Kay S, Sinha T (eds) *Lessons from pension reform in the Americas*. Oxford University Press, Oxford
- Skoufias E, Davis B, Behrman J (1999) An evaluation of the selection of beneficiary households in the Education, Health, and Nutrition Program (PROGRESA) of Mexico. International Food Policy Research Institutes, Washington DC
- Smith JP (1995) Racial and ethnic differences in wealth in the Health and Retirement Study. *J Hum Resour* 30(5): S158–S183
- Smith JP (1999) Healthy bodies and thicker wallets: The dual relation between health and socioeconomic status. *J Econ Perspect* 13(2):145–166
- Smith KV, Goldman N (2007) Socioeconomic differences in health among older adults in Mexico. *Soc Sci Med* 65:1372–1385
- Torres JL, Villoro R, Ramírez T, Zurita B, Hernández P, Lozano R, Franco F (2003) La salud de la población indígena en México. In: Knaul F, Nigenda G (eds) *Caleidoscopio de la Salud*. Mexico, D.F.: Fundación Mexicana para la Salud
- US Bureau of the Census (2000) Table 094, Mid-year Population by Age and Sex, Census Bureau International Data Base: <http://www.census.gov/ipc/www/idb>. Accessed Feb 2008
- Vaupel J, Manton K, Stallard E (1979) The impact of heterogeneity in individual frailty on the dynamics of mortality. *Demography* 16(3):439–454
- Villalobos A, Rojas R (2007) Consumo de tabaco en México. Resultados de las Encuestas Nacionales de Salud 2000 y 2006. *Salud Pública de México* 49(Suppl 2):S147–S154
- Wong R (2003) La relación entre salud y nivel socioeconómico entre adultos mayores: diferencias por género. In Salgado N, Wong R (eds) *Envejeciendo en la pobreza. Género, salud y calidad de vida* (97–122). México, Instituto Nacional de Salud Pública
- Wong R, DeGraff D (2009) Old-age wealth in Mexico: The role of early-life reproductive and human capital decisions. *Res Aging*, forthcoming
- Wong R, Diaz JJ, Espinoza M (2006) Health care use among elderly Mexicans in the U.S. and in Mexico: the role of health insurance. *Res Aging* 28(3):393–408. (DOI) 10.1177/0164027505285922
- Wong R, Díaz JJ (2007) Health care utilization among older Mexicans: Health and socioeconomic inequalities. *Salud Pública de México* 49(Suppl 4):S505–S514
- Wong R, Espinoza M (2003) Ingreso y bienes de la población de edad media y avanzada en México (Income and assets of population in middle- and old-age in Mexico). *Papeles de Población* 37:129–166
- Wong R, Espinoza M, Palloni A (2007) Adultos mayores mexicanos en contexto socioeconómico amplio: Salud y envejecimiento. *Salud Pública de México* 49(Suppl 4): S436–S447
- Wong R, Figueroa ME (1999) Morbilidad y utilización de servicios de salud entre población de edad avanzada: Un análisis comparativo (Morbidity and use of health services among the elderly: A comparative analysis). *Papeles de Población* 5(19):103–124
- Wong R, Higgins M (2007) Dynamics of intergenerational assistance in middle- and old-age in Mexico. In: Angel J, Whitfield KE (eds) *The health of aging Hispanics: The Mexican origin population*, Springer Publications, New York, pp 99–120
- Wong R, Palloni A (2006) Health transitions among older adults in Mexico: A couples approach. Paper presented at the population association of America meetings. Los Angeles, California, April
- Wong R, Ofstedal MB, Agree E, Yount K (2008) Unhealthy lifestyles among older adults: Exploring transitions in Mexico and the U.S. *Eur J Ageing* 5:311–326
- Wong R, Peláez M, Palloni A (2005) Self-reported global health among older adults in Latin America and the Caribbean: Usefulness of the indicator. *Panam J Public Health* 17(5/6):323–332
- Wong R, Peláez M, Palloni A, Markides K (2006) Survey data for the study of aging in Latin America and the Caribbean – selected studies. *J Aging Health* 18(2):157–179
- Wong R, Palloni A, Soldo BJ (2007) Wealth in middle- and old-age: The role of international migration in Mexico. *Int Migr Rev* 41(1):127–151
- Ybáñez-Zepeda E, Vargas-Valle ED, Torres JL (2005) Factores asociados a la coresidencia de los adultos mayores de 50 años por condición rural-urbana. *Papeles de Población* 45:29–48

Chapter 12

Ageing in West Africa

Isabella Aboderin

Introduction

West Africa is one of the four sub-regions of Sub-Saharan Africa (SSA). It comprises 15 major countries: Benin, Burkina Faso, Cote D'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone and Togo. The dynamics and implications of population ageing in these nations are best examined in the context of a debate on ageing in SSA as a whole. The first part of this chapter, therefore, charts the origins of this debate and critically examines its scope and the key concerns and perspectives at its heart. In light of this, the second part critically reviews what we presently know about the demography of population ageing and the demographics of the older population in West Africa and what key knowledge gaps remain. The review draws mainly on existing literature from the Anglophone countries of West Africa. Given language limitations, it is unable to capture the body of publications from the region's francophone and lusophone nations. Indeed, it is important to note the significant impediment that language barriers pose to the flourishing of scientific discourse on ageing in Africa as a whole. A second note of caution due at the outset concerns the importance of recognizing the diversity that exists in the cultural, social and environmental contexts in which the ageing of populations and individuals unfolds in West Africa. Nigeria alone, for instance, comprises over 350 ethnolinguistic groups, spread over geographically disparate areas (Nugent 2004; DFID 2004). Sub-regional

overviews, as offered in this chapter, are thus inevitably general, able to capture only broad, cross-cutting themes. An in-depth understanding requires country specific research and analyses.

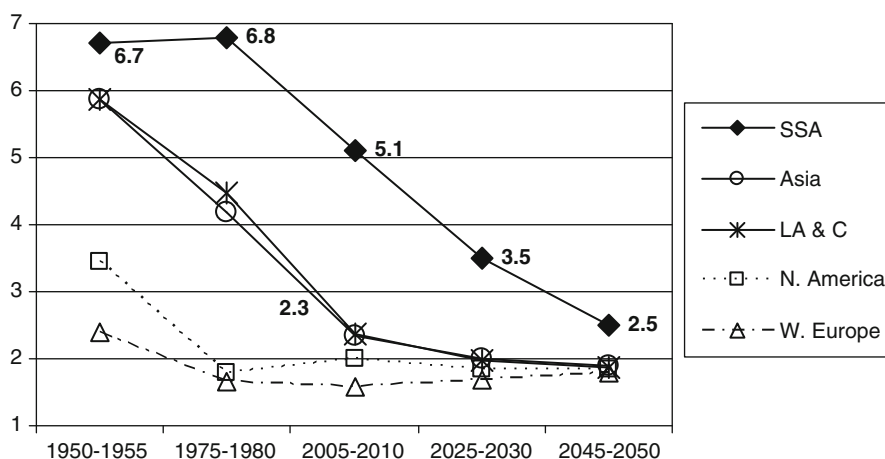
Debate on Ageing in Sub-Saharan Africa (SSA): Key Features

Awareness of ageing in Africa emerged in the early 1980s as part of a broader, United Nations (UN)-led international concern with population ageing in less developed countries (LDC). Driven by the UN Centre for Social and Humanitarian Affairs, the debate was effectively launched by the first UN World Assembly on Ageing (WAAI) in Vienna in 1982 and the ensuing Vienna International Plan of Action on Ageing (UN 1982). The point of departure for the debate on ageing in Africa has been the prediction of rapid growth in the size of the older population over coming decades and, more generally, a progressing demographic transition that will eventually lead to the ageing of entire populations.¹ While the African debate shares this starting

¹ The demographic transition refers to a change in birth and death rates, moving from a state of high fertility and mortality rates to one of low fertility and mortality rates. Originally proposed by Notestein (1945), the demographic transition is posited to comprise four stages. Stage 1, found in pre-industrial society, is characterized by high death and birth rates, which are roughly in balance. Stage 2 sees rapid declines in death rates (in particular infant and child death rates), in particular reductions in infectious disease mortality, due to sanitation, basic medical care (such as immunizations), food supply, education. As fertility remains high, this produces an imbalance with countries experiencing large increases in the size of their population, in particular in the number and proportions of children. Stage 3 sees rapid declines in fertility, among other things thought due to

I. Aboderin
Oxford Institute of Ageing
University of Oxford
Oxford, UK
E-mail: isabella.aboderin@ageing.ox.ac.uk

Fig. 12.1 Trends in total fertility rate: SSA and other world regions, 1950–2050



Source: United Nations Population Division (UNPD) (2008) *World Population Prospects. The 2006 Revision*. Accessed 8 January 2008

point with discourses on ageing in other parts of the developing world, the present demographic parameters for SSA differ markedly from those in the other regions, on several counts.

Demographic Ageing in SSA

Existing demographic estimates in SSA stand out, first, through their tenuousness. Unlike other world regions, most SSA nations currently lack the required systems to produce the kinds of fertility and mortality data that are essential for furnishing solid projections on population ageing. Fewer than ten countries have vital registration systems that produce usable data and only two systems (none in West Africa) cover at least 80 per cent of the population. Recent census data, moreover, is lacking for many countries and, where it is available, is of uneven quality. In the absence of robust vital statistics, demographic projections for SSA are typically based

access to contraception, social, economic and cultural changes that among others reduce value of children's work, increased parental investments in children's education. While population growth begins to level off and in particular the numbers and proportions of children immediately decrease, the number and proportion of youth and young adults (those born during stage 2) swells. Stage 4 is characterized by low fertility and low mortality. Fertility may fall below replacement level, as has already happened in many European nations. The large group born during stage 2 now forms a large aged population. With continuing low fertility and low and possibly further falling mortality the number proportion of older persons in the population rises (see Lee 2003; Robine and Michel 2004).

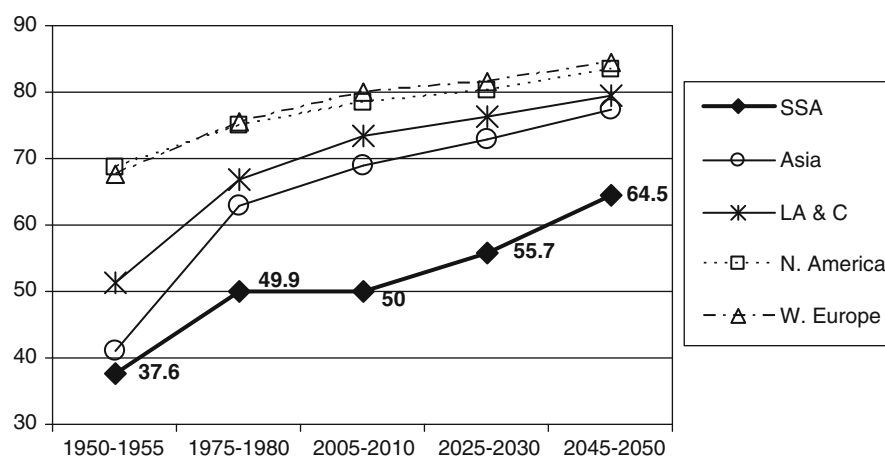
on demographic and health survey (DHS) data, from which fertility, infant and child mortality estimates are derived. These are then matched to model life tables to produce adult mortality estimates (see Velkoff and Kowal 2007).

Second, available estimates suggest a very different picture of population ageing in SSA compared to the other major developing world regions. Asia and Latin America and the Caribbean (LAC), considered to be well into the third or even fourth stages of the demographic transition, have seen large declines in mortality and birth rates over recent decades. Fertility more than halved in both regions from around 5.9 in 1950 to 2.4 in 2005 and is expected to drop below replacement level by 2025 (UNPD 2007–2008). Most SSA countries, in contrast, are in the second, or have barely begun the third stage of the transition (UNPD 2007). Average fertility in the region remains the highest in the world, at 5.13 children per woman (having declined only slightly from 6.73 in 1950) and is projected to fall only to 2.5 by 2050 (see Fig. 12.1). However, some marked country variations exist.²

Mortality – especially infant and child but also adult death rates – too remains at high or very high levels in SSA (WHO 2004). This reflects the combined impacts of continued economic strain, the HIV/AIDS crisis, armed conflict and, more directly, the erosion of health

² Levels of fertility in SSA range from lows of 2–3 children in countries such as Botswana, Gabon and South Africa to highs of 7 children in Niger and Guinea-Bissau. Even within West Africa, great variations exist: from rates between 3 and 4 children in Cote D'Ivoire, Ghana and Senegal to rates between 6 and 7 in Liberia, Mali, Niger and Sierra Leone (UNPD 2008).

Fig. 12.2 Trends in life expectancy at birth: SSA and other world regions, 1950–2050



Source: United Nations Population Division (UNPD) (2008) *World Population Prospects. The 2006 Revision*. Accessed 8 January 2008

and education systems. This erosion followed cuts in public spending that were part of neoliberal structural adjustment programs in the 1980s and 1990s (CfA 2005; UN/DESA 2007a; Soludo and Mkandawire 1999). Most SSA countries have, in fact, seen losses or even reversals of the modest gains made in life expectancy in earlier decades. Today, average life expectancy at birth (LEB) in the region is only recovering the “high” of 50 years last achieved in 1985³ (UNPD 2008). These trends differ sharply from the steady rises and much higher levels of LEB observed in Asia and LAC (see Fig. 12.2).

Given current fertility and mortality trends, SSA is and will remain the youngest region in the world. About 64 per cent of SSA’s population is younger than 25 years (compared to 46 and 48 per cent for Asia and Latin America, respectively), while only 4.8 per cent is aged 60 years or older. The median age is only 18 years. This population age structure is expected to remain relatively unchanged until 2025 and to only shift gradually thereafter. Population ageing in the region is thus expected to remain “moderate” and to proceed much more slowly than in other world regions (UNPD 2007). As Figs. 12.3 and 12.4, respectively, show, SSA’s median age is projected to rise only to 27 years by 2050, compared to values of around 40

in Asia and LAC, while the population share of older persons is expected to grow to only 8.8 per cent (compared to 24 per cent in Asia and LAC) (UNPD 2008).

Although the proportion of older persons in the population will remain low, forecasts expect sharp rises in the absolute size of the older population in SSA. The overall number of persons aged 60+ years is projected to grow from 36.6 million in 2006 to 140 million in 2050 – a more rapid rate of increase than in any other world region or for any other age-group (UNPD 2008) (see Table 12.1). However, exceptions to this trend are predicted for the Southern and East African nations most affected by the HIV/AIDS crisis (e.g. Botswana or Zimbabwe). HIV/AIDS related mortality is expected to significantly curb overall population growth in these countries and to cause only slight rises or even reductions in the size of the older population (Velkoff and Kowal 2007).

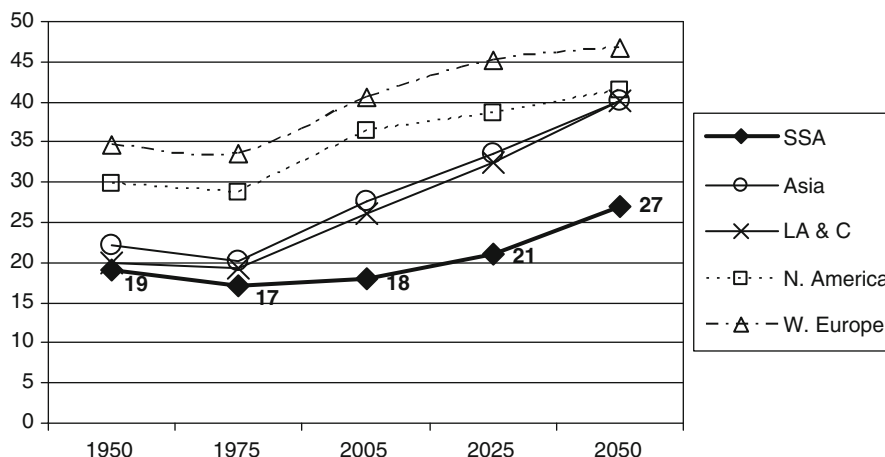
Contrary to common misconceptions arising from the low life expectancy at birth, estimates suggest that the rising number of older individuals in SSA will, on average, live many years beyond age 60 years. Life expectancy at that age is presently 15 years for men and 17 years for women – values that do not differ dramatically from those in other world regions (UNPD 2006).

³ The average figure for SSA masks some important country differences in life expectancy at birth, which ranges from a low of 39.6 years in Swaziland to a high of 64.2 years in Mauritania. Within West Africa, significant variations also exist: from lows of between 43 and 50 years in Sierra Leone, Liberia, Cote D’Ivoire and Nigeria to highs of between 60 and 64 years in Ghana, Senegal and Mauritania (UNPD 2008).

Scope of the Debate

The scope of the unfolding debate on population ageing in Africa has, in some respects, remained

Fig. 12.3 Trends in median age: SSA and other world regions, 1950–2050



Source: United Nations Population Division (UNPD) (2008) *World Population Prospects. The 2006 Revision*. Accessed 8 January 2008

narrower than those in other world regions. This is a reflection, not only of the distinct demographic parameters for SSA but also of persisting shortcomings in capacity for research on ageing in the region (Aboderin 2005a; Ferreira 2005; Cohen and Menken 2006). Limitations of the African debate are conspicuous in the virtual lack of attention paid to illuminating the actual nature of key demographic processes that are to shape population ageing in SSA. For example, no examination has scrutinized the central assumption of sustained fertility declines in coming decades, which are to drive population ageing across SSA countries (UNPD 2007). That the assumption warrants scrutiny, however, is suggested by recent evidence of stagnant or even rising fertility rates in

several nations such as Kenya and Ghana (Bongaarts 2005; Westoff and Cross 2006). Such stalls in countries’ fertility transitions are being debated in terms of their impacts on overall population growth and development prospects in SSA (Cleland et al. 2006; Campbell et al. 2007). However, their implications for projected demographic ageing in the region have been largely ignored. Similarly and with very few exceptions (Kahn et al. 2006), virtually no consideration has been given to critical questions about the trends in mortality, morbidity and disability at older ages that are accompanying the growth of the older population. Is mortality at older ages declining among successive cohorts as it has done in developed and other developing world regions since the

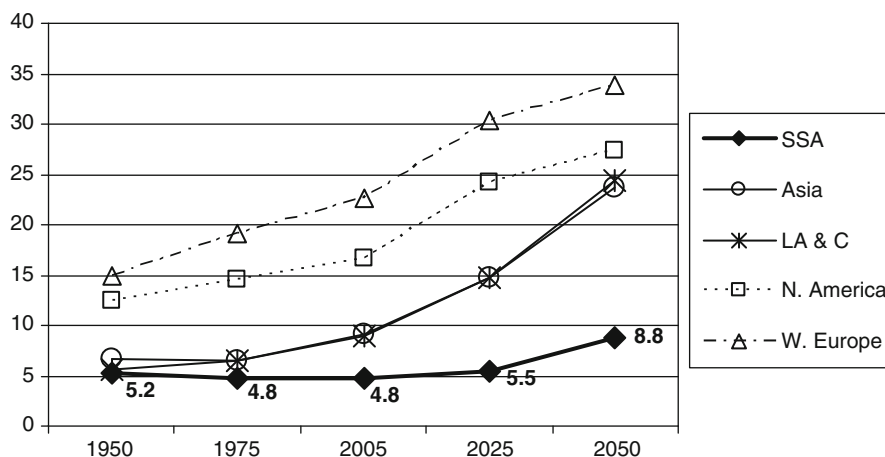


Fig. 12.4 Trends in population share (%) of older persons aged 60+ in the total population: SSA and other world regions, 1950–2050

Source: United Nations Population Division (UNPD) (2008) *World Population Prospects. The 2006 Revision*. Accessed 8 January 2008

Table 12.1 Trends in absolute number (millions) of older persons aged 60+: SSA and other world regions, 2005–2050

	2005	2025	2050	Increase 2005–2050
SSA	37	66	155	320%
Asia	363	709	1,249	240%
Latin America & Caribbean	50	102	187	271%
N. America	56	95	121	120%
W. Europe	42	58	64	50%

Source: United Nations Population Division (UNPD) (2008) World Population Prospects. The 2006 Revision. Accessed 8 January 2008.

1970s (White 2002; Vaupel et al. 1998; Mostafa and van Ginneken 2000)? What are the trends in health, functional status and causes of death among successive cohorts of older persons how do these differ among socio-demographic groups? What processes underlie changes in mortality, morbidity and disability at older ages (Freedman et al. 2008)? The scant attention given to these questions in Africa contrasts starkly with the intensifying debate in Asian and Latin American countries and the long established developed world discourse on this area (see Zimmer and Martin 2007; Robine and Michel 2004; Howse 2006). It is also a serious gap. Insights into trends in older age morbidity, disability and death in SSA are needed not only to gauge likely future care needs (Zimmer and Martin 2007; Waite 2005) but also to advance theoretical understandings of health and mortality shifts underpinning population ageing worldwide (Robine and Michel 2004). Comparative insights from SSA could extend debates on the relevance of (a) extant models of changes in overall population health (an “epidemiological”, or a “health” transition (Omran 1971–1982; Olshansky and Ault 1986; Caldwell et al. 2001; Beaglehole and Bonita 2004)) and (b) theories on later-life health and disability shifts that underlie and accompany increases in longevity. These include the “compression of morbidity” (Fries 1980); “expansion of morbidity” (Kramer 1980; Gruenberg 1977) and “dynamic equilibrium” (Manton 1982) theses, as well as propositions on a “disability transition” (see Robine and Michel 2004; Howse 2006).

A further area of enquiry that is largely absent from the African debate on population ageing concerns the consequences of changing population age-structures. In industrialized and rapidly maturing Asian countries this issue is receiving intense attention, with a focus on implications of falling support ratios for

formal and informal support systems and the impacts of ageing workforces for productivity and economic growth (Boersch-Supan 2001; Harper 2006; Marshall et al. 2001; UNPD 2007). The lack of consideration of such factors in Africa largely reflects the persisting youthfulness and high potential support ratios in the region’s populations (see Table 12.2). Indeed, African societies are believed to enter a “window of opportunity” from about 2020 onwards – as fertility begins to fall and prior to significant increases in the older population – where there is a surplus share of the population in the “productive” ages, ostensibly giving countries the opportunity to harness a first “demographic dividend” for accelerating economic growth (see World Bank 2006; Birdsall et al. 2002).

What then are the main concerns at the heart of the debate on population ageing in SSA? The principal focus has been an essentially “humanitarian” concern about how to ensure security and well-being for the growing numbers of older persons over coming decades. A similar concern, of course, is also central to gerontological debates in the developed world, Asia and Latin America (Palloni et al. 2006; Johnson 2005; Baars et al. 2006; Walker and Mollenkopf 2007). In contrast to these other regions, however, as indicated

Table 12.2 Potential support ratios: SSA and other world regions, 2006 and 2050

	2006	2050
SSA	17	11
Asia	10	4
Latin America & Caribbean	10	3
N. America	5	3
W. Europe	4	2

Source: United Nations Population Division (UNPD) (2008) World Population Prospects. The 2006 Revision. Accessed 8 January 2008.

earlier, virtually no SSA research has actively considered the possible situation of future cohorts of older persons. The focus has been firmly on the wellbeing of today's elderly.

Key Perspectives and Concerns

What has driven this focus, are assumptions about a heightened vulnerability of older people in contemporary society – compared to earlier generations of aged – and a resultant need for policy to safeguard their welfare. Interestingly, this concern echoes that which propelled the nascent western gerontological debate in the 1930s and 1940s. The western concern at the time crystallized a prevailing *popular* worry about a neglect or “abandonment” of older people in urban, “modernized” society. This was part of a broader anxiety about the demise of the family that had arisen in the war and post-war years in response to visible and apparently growing destitution among older people, rising divorce rates, prostitution and illegitimacy (Burgess and Locke 1954; Tibbits 1960). In contrast, the contemporary African concern with the plight of older persons does not build on a parallel popular or public awareness (Aboderin 2007). Rather, its emergence was essentially theory-driven, based on the tenets of modernization and ageing theory (Aboderin 2006a). These theories hold that social status of and family support for older persons are high in traditional, pre-industrial societies, underpinned by customary values of familism and filial obligation. However, these supporting mechanisms erode and are replaced by values of individualism and secularism as societies become progressively industrialized, urbanized and “westernized”. As a result, older people are left role-less, abandoned and dependent on the state (Burgess 1960; Cowgill 1972, 1974).

The modernization and ageing thesis was first advanced by U.S. scholars in the 1960s and 1970s as an interpretation of observed shortcomings in family support for older people in western societies and their increasing dependence on state assistance since the post-war years (Burgess 1960; Cowgill 1972, 1974). While Burgess' early propositions built on data from western societies, Cowgill's later, more formulaic

theory was based on a systematic, *cross-cultural comparative* analysis of data from fifteen different societies at various stages of “development”. It was, moreover, predicated on a structural-functionalist model of linear, uniform development, which equated contemporary pre-industrial developing societies with pre-industrial historical societies in the West. As such, the later formulation not only “explained” older persons' difficulties in the West but also entailed a *prediction* of the fate that awaited the aged in developing countries as these continued to “modernize”. It was precisely this prediction that UN thinking in the early 1980s took as a basis for its emergent concern with ageing in less developed nations in developing nations (Aboderin 2004a, 2006a).

Worldwide, the overall responsibility of the family to provide the traditional care and support needs of the ageing is diminishing ... In traditional societies, old people have always enjoyed a privileged position based on respect, consideration, status and authority. But this is starting to be upset under the influence of modern trends and that privileged position is now being questioned. It is therefore time to become aware of these changes... (UN 1982:17/18).

Perplexingly, the UN adopted this perspective in the absence of any supporting evidence (Marshall 1990) and in the face of strong empirical and theoretical criticism that modernization and ageing theory had received in the Western debate from the late 1960s to the early 1980s. Evidence from historical, contemporary and ethnographic research had clearly shown the “abandonment” notion, fits neither with “history nor with contemporary arrangements” (O'Rand 1990), while theoretical critiques had highlighted the fallacy of the assumption of a uniform, linear mode of development (see O'Rand 1990). The UN's uncritical use of the modernization and ageing model served to entrench it as the central framework for analysis in the small body of research on ageing in SSA (and other less developed regions) that ensued in the decade following the 1982 WAAI (Shapiro and Kaufert 1983). Most of the early studies, accordingly, focused on generating base-line data on older persons' status and support needs, in a sense, to assess the extent to which modernization had already impacted on older persons' well-being. The investigations – mainly single country, cross-sectional surveys – typically produced descriptive information on patterns of

older persons' social, economic, health and housing status, their receipt of family support and, in some cases, their roles in family and community (Apt 1987; Brown 1985; Ekpenyong and Peil 1985; Ekpenyong et al. 1987; Peil et al. 1989; Ferreira et al. 1992; Nyanguru and Peil 1993; Nyanguru et al. 1994). A small number of studies additionally examined the degree to which customary norms of filial obligation continued to be endorsed in African societies (e.g. Dorjahn 1989; Togonu-Bickersteth 1989; Togonu-Bickersteth and Akinnawo 1990; Ohuche and Littrell 1989). A parallel strand of ethnographic research in the 1980s and early 90s mainly explored experiences of old age and intergenerational relationships in various cultural contexts (e.g. Sangree 1992; Keith et al. 1994; Foner 1993).

The data accumulating from the early-phase research showed, on the one hand, a high prevalence of intergenerational co-residence, family support for older people and customary norm endorsement. On the other hand, and matched by anecdotal or ethnographic evidence of (rising) neglect of older persons, it showed sizeable proportions of older persons to report inadequacies in family support (especially material support) and identified possible subtle shifts in customary normative expectations. In keeping with the modernization framework, the findings were largely interpreted as signifying a broad persistence of traditional modes and systems but also the beginnings of a decline in family support for the aged, wrought by forces of modernization and westernization (see Aboderin 2004a). Some authors additionally listed the effects of economic hardship as further negative impacts on old age support (Hashimoto and Kendig 1992). Unlike some Asian and Latin American research at the time (e.g. Goldstein et al. 1983; De Lehr 1992) there was little critical examination of the modernization thesis and little exploration of either the *actual* nature (if any) of changes in older persons' situation, or the underlying causes and their implications of changes (Ferreira 1999; Aboderin 2004a). The interpretations of early-phase research findings served to reinforce perceptions of a growing vulnerability of the older population and firmly entrenched the concern that had fuelled the debate on ageing in Africa thus far. Indeed, the concern has continued to provide the *raison d'être* for most research on ageing in SSA up to the present.

Recent Developments

Much of the more recent research has continued to generate simple descriptive data on older people's basic demographic, social, economic, health and residential status. However, several investigations have sought to generate more detailed or nuanced insights into older persons' situation – in particular with respect to their family and intergenerational relationships and support systems (e.g. Apt and Grieco 1994; Apt, Koomson et al. 1995; Campbell 1994; Cattell 1997a, b, 1999; Everatt and Orkin 1994; Ferreira 2006a; Møller 1994; Møller and Sotshongaye 1996; Sagner and Mtati 1999; Van der Geest 1997a, b, 2002, 2004). Some studies, moreover, have developed explicit critiques of modernization and ageing theory and its continued, often uncritical use in SSA research. On this basis they have attempted to explore in-depth the nature and causes of changes in old age support arrangements (Aboderin 2004b, 2006a). The late 1990s also saw an intensifying research interest in the circumstances of older persons in "crisis" situations. While a few studies have explored these in emergency and conflict contexts (Bramucci and Erb 2007), most attention has focused on older people's fate in the context of HIV/AIDS. A rapidly growing body of research in this area has explored older persons' role as carers for ailing children and/or orphaned grandchildren, as well as their loss of support from such younger kin (Ferreira 2006b; Ingstad et al. 1997; Merli and Palloni 2006; Ainsworth and Dayton 2003; Dayton and Ainsworth 2004; Hosegood and Timaeus 2006; Ntozi et al. 1999; WHO 2002; Knodel et al. 2003).

In the last few years the debate on ageing in SSA has gained significant impetus due to the conjunction of a number of international initiatives that emerged between 2002 and 2005. Together these have reaffirmed the importance of addressing issues of ageing in developing countries and have focused international attention specifically on development in Africa. In 2002, the second UN World Assembly on Ageing (WAAII) in Madrid addressed the apparent lack of progress in policy action on ageing in the developing world. Marshalling research insights that had accumulated since 1982, the ensuing Madrid International Plan of Action on Ageing (MIPAA) highlighted core policy challenges and provided directions for addressing them

(UN 2002). Crucially, the MIPAA asserted the inextricable link between the need for policies on ageing and older persons and the broader quest for development in poor developing nations. The plan consequently called for the integration of policy on ageing with mainstream national and international development agendas, in particular those encapsulated in the Millennium Development Goals (MDG).⁴ In 2003, the importance of such an approach for Africa was affirmed in African Union's Policy Framework and Plan of Action on Ageing (AU-Plan) (AU/HAI 2003), which aimed to guide policy formation specifically in African member states (see Aboderin and Ferreira 2009).

In 2005, issues of development in SSA in general received unprecedented international public attention. The professed "year for Africa", saw G8 governments pledge support to enable this poorest and least developed region to achieve the MDG⁵ (UN/DESA 2007a, b), while high profile campaigns galvanized popular awareness and pressure (Aboderin 2007). The combination of an intense international focus on African "development" and a heightened awareness of ageing as a crucial (policy) issue for developing world populations has stimulated the present debate on ageing in SSA in two important ways. First, it has crystallized an expanded picture of the range of interacting factors that may cause a vulnerability of older persons in contemporary SSA societies, namely:

a) A diminishing capacity to engage in sufficiently paid productive work and/or self-care, due to physical, mental and social changes or attributes (e.g. very low literacy levels, or age-related chronic con-

ditions) associated with individual chronological ageing in the SSA context.

- b) Effects of rapid socio-cultural change, economic stress, rural to urban migration of the young and acute crises, such as the HIV/AIDS epidemics or armed conflict. These, alone, or in combination, can place (i) increasing strain on family support systems and (ii) new support burdens on older persons. Symptoms of the former include increasingly visible destitution, begging and abandonment of older persons in cities; and isolation and hardship among those left behind in rural areas (e.g. Apt 1997; Aboderin 2006a; Mba 2004). Additional support burdens, meanwhile, arise through caring for younger kin who are affected or orphaned by HIV/AIDS, or who are otherwise unable to earn a livelihood. The provision of such support can affect older persons' material, physical and emotional well-being negatively (see Cohen and Menken 2006; Ferreira 2006b).
- c) A virtual lack of social service provision for older people in most SSA countries. Existing services, health care in particular, largely do not cater for the needs of older persons (see e.g. McIntyre 2004; WHO 2006) and only a handful of countries operate a formal old age social security system (Botswana, Lesotho, Mauritius, Namibia, Senegal and South Africa). A poignant example of a lack of social provision is the widespread exclusion of older persons from humanitarian responses in emergency situations, such as Darfur (Bramucci and Erb 2007).

Second, the recent momentum has spawned a series of initiatives led by African and international scholars seeking to promote and p directions for research on ageing in Africa. Given that most investigations to date have remained patchy, descriptive and often poorly mounted (Ferreira 2005), the aim has been to foster inquiries that can effectively advance policy action on ageing in SSA while also forging a high quality, globally engaged scientific debate on ageing in Africa (Aboderin 2005a, b, 2007; Aboderin and Ferreira 2009; Cohen and Menken 2006). In this regard two elemental tasks have been emphasized. These are (i) to generate robust and critical understandings of older persons' situations and well-being and (ii) to forge effective conjectures of developments for the future (including for future cohorts). A number of methodological and analytical approaches have

⁴ The eight MDGs were set by the international community in its 2000 UN Millennium Declaration (UN 2000). The goals entail specific targets for improvements in primary education, extreme poverty, HIV/AIDS, child and maternal mortality, the fight against HIV/AIDS and malaria, access to drinking water and slum conditions.

⁵ At the time of writing, two-thirds of the world's least developed countries (UN classification) and its low-income economies (World Bank classification) are in SSA. Of 42 major SSA countries, only six are lower middle income and only four are upper middle income economies. All but two of the world's 30 countries with low human development (UNDP Human Development Index) are in SSA (UNDP 2006; World Bank 2007). Among numerous social ills that beset SSA countries are immense challenges of rural stagnation, urban slums (62 per cent of the urban population lives in slums), the HIV/AIDS crisis and armed conflict. The latter two crises affect SSA more gravely than any other world region and heighten the problems of poverty (see Aboderin and Ferreira 2008).

been highlighted as necessary for such an endeavor. First, a generation of better quality and more representative and comparable base-line data on the socio-demographic and health status of older populations (Kowal et al. 2002; Cohen and Menken 2006; Ferreira and Kowal 2006). This requires, among others, examination of the local applicability and validity of standard survey indicators or instruments. Second, a vital need to go beyond description towards the production of grounded, incisive analyses and theoretical “explanations” of older people’s circumstances and realities. Explanations must capture both individual actors’ micro-level perspectives and their recursive relationships with meso-level family and community contexts and the wider macro-level structural context – including increasingly salient influences of globalization (Ferreira 1999; Aboderin and Ferreira 2009). Third, a need for new cross-national comparative analyses to deepen insights into structural determinants and heighten the weight of findings (Aboderin 2005b; see also Zimmer and Martin 2007). Fourth, a more critical examination of the actual level of vulnerability and disadvantage among older people relative to younger age-groups now and in the future (Aboderin 2007; Aboderin and Ferreira 2009).

West African Research and Evidence on Ageing

The above perspectives provide a useful basis for examining what we presently know about population ageing and older persons in West Africa. Studies in the sub-region – in particular in Ghana and Nigeria – have always constituted a large portion of African research on ageing. However, their share has declined in recent years, given the budding research on older persons and HIV/AIDS in Southern and East Africa – the sub-regions most affected by the epidemic (UNAIDS/WHO 2006; Ferreira 2006b). At the time of writing, no study on HIV/AIDS and older people has been conducted in West Africa, which has the lowest adult HIV prevalence in SSA (UNAIDS/WHO 2006). Instead the focus of recent West African research on ageing has been on five main areas of inquiry, including, at the simplest level, descriptions of the basic demographic profile of the older population.

Demographic Profile of Older Populations

Studies in Ghana (Mba 2004, 2007) and Nigeria (NPC 2004) have examined the socio-demographic profile of the older population, using secondary analysis of available cross-sectional and/or longitudinal census or DHS data. NPC (2004) analyses 1991 Nigeria census data, while Mba (2004, 2007) analyses 1960, 1970, 1984 and 2000 Ghana census data and 1993, 1998 and 2003 Ghana DHS data. The studies typically explore the size, spatial (rural/urban), gender and age distribution of the older population, as well as patterns in educational, marital, employment and occupational status. The generated cross-sectional snapshots confirm several key features commonly associated with older populations in SSA. They show a majority of older persons to live in rural areas (72 per cent in Nigeria, 68 per cent in Ghana in 2003) and to have no formal education (78 per cent in Ghana in 2003; 76 per cent in Nigeria) – although these proportions may be declining. Ghana DHS data indicate a fall in the share of rural dwellers (from 75 per cent in 1993) and of those without education (from 81.9 per cent in 1993). These trends, respectively, reflect likely effects of rural-urban migration and increased “ageing in place” in cities and the arrival of younger cohorts who benefited from expansions of education in the 1940s and 50s (George 1976).

As regards marital status, a majority of the older population are currently married (68 per cent in Nigeria, 57 per cent in rural Ghana), although considerable proportions (30 per cent in Nigeria, 38 per cent in rural Ghana) are widowed, divorced or separated. The Nigerian data further highlight important gender differences in marital status, with a large majority of older men (88.8 per cent) but less than half of older women (43.8 per cent) being married. This common pattern reflects both (i) older men’s greater likelihood of remarrying (younger wives) after separation, divorce or death of their spouse and (ii) older women’s greater likelihood of surviving their spouse (as husbands are mostly older than their wives and women usually live longer) (see UNPD 2005). The 2003 Ghana data confirm the expected gender difference in life expectancy, showing older men to be outnumbered by older women at a ratio of 98.7–100. The Nigerian 1991 data, however, reveal a reversed ratio (117 men to 100 women). A closer look at lon-

Table 12.3 Trends in gender ratio and proportions of older people aged 75+ in the total older population (aged 60+), Ghana census data, 1960, 1970, 1984 and 2000

	1960	1970	1984	2000
Gender ratio (men:100 women)	119	104	98	98
Per cent of older people aged 75+	29%	29%	30%	38%

Source: Mba 2007.

itudinal census data available for Ghana suggests that secular trends might underlie this difference. The figures show a consistent decline from a large male advantage in 1960 (ratio 119) to a reversal of the ratio and the emergence of a female advantage by 1984 (ratio 98) (see Table 12.3)⁶ Ghanaian census data also point to clear trends in the older populations' age-structure (Table 12.3)⁷ While the proportions in all older age-groups have risen relative to the total population from 1960 to 2000, the rate of change has been largest for the oldest age-groups (75–79 and 80+ years). The proportion of those in the oldest groups, compared to those aged 60–74, has thus steadily grown from 29 per cent in 1960 to 38 per cent in 2000 – suggesting possible decreases in mortality at older ages.

Unfortunately, neither of the apparent trends has been further discussed – despite the critical questions they raise about underlying changes in morbidity and disability. What may account for the apparent mortality decrease – successive healthier cohorts reaching old age (i.e., changed exposures in earlier life) and/or improved health provision or conditions in later life? Do underlying processes differ for men and women? Does the declining gender ratio reflect losses in male or gains in female survival advantage and have they occurred in earlier life or during old age? What factors or exposures have caused these trends? What changes in disease and disability have shaped and accompanied them? What will be the health and survival potential of future cohorts of older persons – those who ben-

efited in their childhood in the 1950s and 1970s from medical interventions and generally rising prosperity (Robertson 1981) and those whose early life unfolded in a context of economic hardship and eroding health provision in the 1980s and 1990s (Donkor 1995)? Answering such questions requires complex investigations of intra- and inter-cohort age-group trends in mortality and health, coupled with examinations of extant socio-cultural and economic contexts over relevant time frames. To be sure, such analyses are impeded by the lack of data and precise age estimates. However, even basic further explorations – such as comparisons between age-group specific gender ratios at different times – would allow the generation of relevant hypotheses.

Economic, Health and Support Status of Older Persons

The largest share of recent research on ageing in West Africa has concentrated on four areas of inquiry that are commonly taken as indicators of older persons' well-being namely:

1. Work and income
2. Living arrangements
3. Health status
4. Attitudes to and receipt of intergenerational family support

Within each area, studies have typically described key features or categories of the phenomenon in question and in many cases, their basic socio-demographic correlates, that is, their distribution by rural/urban residence, gender and at times, socio-economic position (SEP). The following sections review each of the four areas in turn, highlighting key findings and remaining knowledge gaps. A concluding section pinpoints cross-cutting requirements and challenges for future research on ageing in West Africa.

⁶ Although Nigeria conducted its 2000 census round in 2006/7, relevant analyses for the older population are, unfortunately, not yet available. Such data would allow exploration of possible changes in gender ratios since 1991.

⁷ The typical absence of birth records for most present cohorts of older persons in the West African (or SSA) context pose serious difficulties for accurately ascertaining older persons' chronological age and raise the risk of age-selection bias (NPC 2004; Baiyewu et al. 1997; Ogunniyi and Osuntokun 1993; Cohen and Menken 2006). Findings on the age-structure of the older population thus need to be interpreted with caution.

Work and Income

Evidence on aspects of older persons' income, employment and/or occupational status comes from two relatively dated surveys on older people in Nigeria (Baiyewu et al. 1997) and Ghana (Apt 1996), as well as from analysis of Nigerian 1991 census data (NPC 2004) and 2000–2002 urban labor market survey data from capital cities in seven Francophone countries (Kuepie 2007).⁸ The generated evidence shows, above all, that large proportions of older persons remain in the labor force. Nigerian census data, for example, finds 66 per cent remain employed, although the proportions show considerable important gender and rural/urban differences. In rural areas a much larger proportion of older men (around 80 per cent) than older women (43 per cent) continue to work. However, in urban areas the percentages are roughly equal (around 50 per cent) (NPC 2004).

Kuepie's (2007) more recent data largely echo this urban pattern. They show urban labor force participation rates of older persons to range from 24 per cent in Dakar (Senegal) to 42 per cent in Niamey (Niger) and find negligible differences between the overall proportion of men (34 per cent) and women (30 per cent) who continue to work across the seven cities. The direction of gender differentials, however, varies between cities, with women more likely to work than men in Cotonou, Abidjan and Lome and the reverse being the case in Bamako, Ougadougou, Niamey and Dakar.

Evidence on older persons' occupational status comes from the Nigerian 1991 census. It highlights the overall dominance of agricultural work and informal sales or trade among older persons but shows considerable differences in the importance of each sector for women compared to men. A vast majority (77 per cent) of employed older men but only 49 per cent of older women, were found to work in agriculture, while 38 per cent of older women but only 6 per cent of older men work in sales or trade (NPC 2004). The concentration of older persons in the farming and informal trade sectors suggests low income levels. Agriculture, in particular, is characterized in much of West Africa by relatively high levels of poverty and a large prevalence of family-based subsistence farming (Oduro and

Aryee 2003; Ogwumike 2001). However, virtually no data exist on individual older people's actual income. The little evidence that is available does point to low (and relatively smaller compared to middle aged adults) earnings in old age. Kuepie (2007) shows hourly urban wages begin to decline around age 55, dropping to levels comparable to those for young workers (ages 20–34), while Baiyewu et al. (1997) reported that a large majority (74 per cent) of older persons in their sample received an income below a defined poverty line. However, such figures must be treated with caution, given the difficulty of accurately estimating monetary and non-monetary income in the SSA context (Cohen and Menken 2006).

Findings on sources of older persons' income, meanwhile, confirm that only a minority receive pensions. Estimates vary from 6.4 and 12 per cent in a Nigerian and Ghanaian sample, respectively (Baiyewu et al. 1997; Apt 1996) but larger proportions (ranging from 22 per cent in Ouagadougou to 50 per cent in Cotonou) were found in Francophone urban areas (Kuepie 2007). In all studies, older women are consistently found to be much less likely than older men to receive pensions – reflecting women's limited access to pensionable, formal sector employment in the SSA context (Mitter and Rowbotham 1995). In addition to a lack of pensions, evidence shows that most older persons receive no income from private sources such as assets or saving. Kuepie (2007) reported only 9 per cent of older people across seven cities to have access to such income while Apt (1996) found only 5 per cent of older women and 16 per cent of older men to have personal savings.

The above findings provide valuable insights. In particular, they highlight the importance of work in older persons' lives and the likely differing opportunities for, or constraints on it and the accumulation of earnings for men and women in rural and urban contexts. However, the existing evidence leaves unanswered crucial questions about the nature, determinants and implications of older persons' work and about temporal trends in these. For example, what types of work do older men and women do within the key sectors of agriculture and trade? What motives, preferences or constraints shape an older persons' decision to remain in the labor force and in their respective occupations? What are the incomes of working older persons and how adequate are they to meet needs? What is the overall impact of work or lack thereof on older persons' well-being? How

⁸ Kuepie (2007) analyzed data from Cotonou (Benin), Ougadougou (Burkina Faso), Abidjan (Cote D'Ivoire), Bamako (Mali), Niamey (Niger), Dakar (Senegal) and Lome (Togo).

do older people's present employment, occupational and income patterns compare to their earlier working lives and to those of previous cohorts of elderly? How do work-related motives and impacts differ between older men and women, occupational groups and rural and urban areas?

Health

The area of health has attracted by far the largest volume of recent West African research on ageing, with studies falling into three broad areas. First, a number of investigations, especially in Nigeria and Ghana, have provided descriptive overviews of levels and patterns in older persons' basic health and/or functional status – typically using measures of self-reported health, difficulties in performing ADLs or IADLs and, in some cases, exploring their basic correlates (by age, sex and rural/urban residence). Studies have drawn either on secondary analysis of general survey data (Mba 2006), or on primary data generated from cross-sectional surveys among differently-sized samples of community-dwelling older persons (Gureje et al. 2006; Baiyewu et al. 1997).

Second, a series of surveys have explored various aspects of the basic epidemiology (prevalence, correlates, risk factors, associated disability) of specific disease conditions among older persons. Conditions have included hypertension (Lawoyin et al. 2002; Agyemang 2006; Kaufman et al. 1996; Mba 2006); diabetes, arthritis and malaria (Mba 2006); major depressive disorder (Gureje et al. 2007), dementia (Gureje et al. 2006); impaired vision (Fafowora and Osuntokun 1997; Nwosu 2000; Bakare et al. 2004; Baiyewu et al. 1997) and over- or undernutrition (Olayiwola and Ketiku 2006; Oguntona and Kuku 2000; Bakare et al. 2004; Glew et al. 2004; Lawoyin et al. 2002).

Third, a small number of quantitative and qualitative analyses in various countries have begun to explore levels of health care use among older persons (McIntyre 2004; Agyemang 2006; Gureje et al. 2007). In addition, some studies have looked at local cultural perspectives regarding causes and treatment of specific diseases, including dementia (Uwakwe and Modebe 2007; Ogunniyi and Aboderin 2007) and diabetes (deGraft-Aikins 2005).

The findings emerging from the above studies paint a seemingly inconsistent picture. On the one hand,

they find only a small minority of older persons in study samples to report having functional disabilities and/or poor self rated health. Estimates of the latter range from 5.3 per cent in urban Ghana (Mba 2006) to 15 per cent in Nigeria (Baiyewu et al. 1997) – percentages that are not dissimilar to those found in urban Latin America (Palloni and McEniry 2007). The proportions of older persons reporting functional disabilities, meanwhile, are even smaller. Surveys show only 3 to 4.4 per cent of their sample to have severe functional disabilities (i.e., limitations in at least one ADL) (Gureje et al. 2006; Baiyewu et al. 1997) and 9 per cent to have moderate functional disability (i.e., limitations in at least one IADL) (Gureje et al. 2006). These figures are comparable to those found among older women in Brazil (Parahyba et al. 2005) but are considerably lower than those observed in several Asian countries (Ofstedal et al. 2007), in urban Latin America (Palloni and McEniry 2007) and the industrialized world (Freedman et al. 2008).

On the other hand, studies have found large proportions of their samples to report chronic and acute conditions. In various surveys, a large share of older persons (ranging from 22 to 57 per cent) have reported blindness or impaired vision (Baiyewu et al. 1997; Nwosu 2000; Bakare et al. 2004); malaria (54 per cent), hypertension (42 per cent)⁹ and joint pains/arthritis (23 per cent) (Mba 2006). Non-negligible proportions have, moreover, been found to report diabetes (8 per cent) (Mba 2006) and to have been diagnosed (using standard diagnostic criteria) as suffering from dementia (10 per cent, reaching 21 per cent among those aged 80+), depression (7 per cent) and hypertension (Gureje et al. 2006, 2007; Agyemang 2006; Lawoyin et al. 2002). Finally, up to 15 per cent, respectively, are shown to be underweight or overweight, (Oguntona and Kuku 2000; Bakare et al. 2004; Olayiwola and Ketiku 2006).

Available evidence on older persons' access to formal health services consistently points to significant deficits and/or possible age-related inequalities in health. Analysis of Living Standards Measurement Survey (LSMS) data for Cote D'Ivoire, for example, indicates that older persons obtain less health care than younger adults or children, despite their greater

⁹ Several study findings have, furthermore, confirmed the widely observed link between hypertension and old age (Lawoyin et al. 2002; Agyeman 2006).

incidence of ill-health (McIntyre 2004). Gureje et al. (2007) found the majority of older adults with life time depression did not receive treatment, while other studies document shortfalls in treatment for diabetes in Ghana (de Graft-Aikins 2005) and for dementia in Nigeria (Uwakwe and Modebe 2007; Ogunniyi and Aboderin 2007).

Only limited data thus far exist on correlates of older persons' health, functional status or health care use. What is available points to important rural/urban and gender differences. Functional disability, as well as depression and dementia are found to be significantly higher among older women than older men (Gureje et al. 2006a, b, 2007), while the reverse is the case for hypertension. Regarding rural/urban patterns, studies consistently find higher rates of hypertension, functional disability and depression among urban dwellers than among their rural counterparts, with the latter two conditions exhibiting a graded elevation of risk from rural to semi-urban to urban residents (Lawoyin et al. 2002; Agyemang 2006; Kaufman et al. 1996; Oguntona and Kuku 2000; Bakare et al. 2004; Olayiwola and Ketiku 2006). Functional disability shows no apparent relationship to socio-economic position (SEP). Risk of depression, however, is linked to higher SEP¹⁰ – an association that largely accounts for its link to urbanicity. Evidence furthermore links the likelihood of receiving treatment for depression to higher SEP and urban residence (Gureje et al. 2007), while shortfalls in diabetes and dementia care seem connected to low income (though no formal analysis of correlates exists (de Graft Aikins 2005; Uwakwe and Modebe 2007; Ogunniyi and Aboderin 2007)). Levels of hypertension treatment, meanwhile, appear similar in rural and urban areas (Agyemang 2006).

The accumulated evidence offers a broad picture of the range of and disparities, in health risks among present cohorts of older people. Nonetheless, it largely fails to provide a coherent understanding of the levels and trajectories of “objective” or subjective ill-health and disability in this population and of their determinants. Moreover, virtually no insight presently exists on how patterns and causes of morbidity, disability and mortality among today's older people differ and have evolved from those of previous cohorts. In other

words, we know little about the extent to and ways in which a “health transition” or epidemiological transition has been occurring in the older population. These major gaps reflect key methodological and conceptual limitations in research thus far.

First, is a lack of nationally representative survey data that would allow robust generalizations. Most data, except for that derived from the Ibadan Study of Ageing (Gureje et al. 2006a, b, 2007) is relatively dated and derived from mainly small-scale, non-probability samples. In addition, given *a priori* expectations of the dominance of chronic disease in old age, existing studies have paid virtually no attention to levels and implications of infectious disease morbidity among their older respondents.

Second, are fundamental uncertainties about the local application of many of the indicators used to assess ill-health and its socio-demographic correlates. The measures of self-reported health and, to a lesser extent, ADL and IADL scales, are key examples of the former. On the one hand, the low prevalence of poor self-reported health or reported functional disability raises the possibility of a constitutional resilience of an older population who survived the high mortality context that prevailed in West Africa in their early life (Gureje et al. 2006). On the other hand, the high prevalence of specific disease conditions gives cause to question whether there is indeed a lack of health and functional limitations, or whether the relative absence of poor self-rated health (and disability) in fact reflect cultural or life-stage-specific conceptions about health, function and complaints about ill-health in old age. The health survey literature certainly recognizes that self-rated health – though it effectively predicts mortality, morbidity and functional ability among literate older populations in developed countries with advanced health systems – may be less predictive in poor developing world settings. In the latter, populations have much lower educational status and contact with formal health services and, possibly, very different perspectives on health and illness in old age (e.g. Kuhn et al. 2006; Salomon et al. 2004). Unfortunately, we have only scant knowledge about these perspectives in West African societies. However, the observed prevalence of self-reported or diagnosed disease conditions, too, is problematic. The former presupposed knowledge that older respondents would have to obtain through previous diagnosis by formal

¹⁰ SEP is measured by a score on an inventory of household items, such as TV, refrigerator, fans, stove or cooker, car, telephone, chairs or clock.

medical services – something that is far from given in the West African context. The latter build on the use of standard diagnostic criteria (typically developed in the western developed world context), for example, for dementia and depression (Gureje et al. 2006, 2007). Their use presumes that the nature of sentiments, thought and conduct related to mental illness are equal between “Western” and West African (or specifically Nigerian) culture. This assumption, as others have noted, still requires empirical testing. In other developing world settings it has not held, thus requiring the modification of standard diagnostic instruments (Bass et al. 2007; Bolton 2001; Draguns and Tanaka-Matsumi 2003). In the same vein, evidence indicates that standard BMI criteria may be unable to efficiently capture weight-related metabolic risk in black populations (Carroll et al. 2008).

Third, little, if any, effort has thus far been made to further illuminate observed socio-demographic correlates of health among older persons. The evident gender disparities in risk of functional disability, depression and dementia, oddly, have received no discussion at all. The detected rural/urban and SEP patterns, meanwhile, often have simply been interpreted – without supporting evidence – as indicating differences in urban and rural (or poor and rich) lifestyles and/or attitudes. Such interpretations have often implicitly built on modernization theory assumptions, which see urban, higher SEP groups as having more westernized and “modern”, individualistic attitudes and lifestyles, while rural and lower SEP groups retain traditional, familistic ways of life. Thus, for example, the observed relationship of higher depression risk to urban residence and higher SEP (which contrasts with that found in developed world settings) is interpreted as reflecting either a greater readiness of urban, wealthier residents to admit to depressive symptoms or, conversely, greater “traditional” protective family and social networks among rural and poorer older persons (Gureje et al. 2007). However, no alternative interpretation has posited resource or infrastructural constraints as accounting for rural/urban or SEP disparities, for example in the likelihood of receiving treatment for depression or diabetes (Gureje et al. 2007). However, no empirical evidence has been generated, which elucidates how individual attitudes, family arrangements and structural constraints have interacted over the life course to create socio-demographic disparities in health. This information gap is compounded by limitations in the

indicator of socio-economic position (SEP) that studies have used (e.g. Gureje et al. 2006, 2007). The measure, based on a score from an inventory of household items, is a standard method of estimating economic wealth in low income settings (Ferguson et al. 2003). However, its relevance for gauging the level of material resources older people have available to invest in their well-being is questionable, for a number of reasons. First, measures of aggregate household wealth leave open the critical question of how resources are allocated to older persons within households. Second, the lack of certain items in older persons’ households – such as refrigerators, TVs or cookers – could reflect older persons’ active preferences, rather than their incapacity to afford them. Similarly, the absence of other items such as electricity or toilets may reflect general, infrastructural conditions (for example in rural areas), rather than individual household deprivation. Unfortunately, West African research has not so far considered the pressing need for refined explorations of the social determinants of health and health disparities in old age. This omission contrasts sharply with the burgeoning research in this area in Asia, Latin America and the developed world (e.g. Bos and Bos 2007; Palloni and McEniry 2007; Kaneda and Zimmer 2007; Jatrana and Chan 2007; Siegrist and Marmot 2007; Marmot and Wilkinson 2006; Banks et al. 2007) and beginning research interest in other SSA sub-regions (Kuate-Defo 2006).

Living Arrangements

Several recent studies have offered relatively detailed assessments of the older persons’ living arrangements in Ghana (Mba 2007) and in a range of other West African countries, as part of larger, cross-national analyses for SSA (Kakwani and Subbarao 2005; Zimmer 2007) or globally (UNPD 2005).¹¹ The explorations, mainly based on secondary analysis of cross-sectional or longitudinal DHS or poverty survey data, have variously

¹¹ The UNPD (2005) analysis comprises data for 9 West African states: Benin, Burkina Faso, Cote D’Ivoire, Ghana, Guinea, Mali, Niger, Nigeria and Senegal. Zimmer (2007)’s analysis comprises data from six West African nations: Burkina Faso, Benin, Senegal, Guinea, Nigeria and Ghana. Kakwani and Subbarao’s (2005) analysis also comprises data for six West African countries: Burkina Faso, Cote D’Ivoire, Ghana, Gambia, Guinea and Nigeria.

examined types of household composition, their basic distribution and associated relative poverty levels. The research has been underpinned by a widespread view that such arrangements are “essential indicators” of well-being in old age, linked, above all, to the receipt or provision of intergenerational support and care (Zimmer 2007). Specific interest has centered on (i) single person households (ii) skipped generation households (where older persons reside with grandchildren without the presence of an adult child) and (iii) households headed by older persons. Older persons living alone are thought – and in the developed world, Asia and Latin America have been shown – to be particularly vulnerable to poverty and/or a lack of informal care. The prevalence of such single person households is broadly assumed (and in developed world and Asian countries has been observed) to rise with social and economic development – although there are differing views on the principal driving factors (Ruggles 2001; UNPD 2005). Skipped generation households have received growing attention in the context of HIV/AIDS. On the one hand, such formations are recognized as reflecting common West African practices of grandchild fosterage, enabling adult children to pursue economic opportunities (Isiugo-Abanihe 2002). On the other hand the presence (and possible increase) of such households is viewed – and in Asia has been observed – as an impact of the progressing HIV/AIDS crisis, where older people play a growing role as sole carers to grandchildren orphaned by the disease (Zimmer 2007; Knodel et al. 2003, 2007). Finally, households headed by older persons are often viewed, explicitly or implicitly, as indicating the older persons’ role as “main breadwinner” for the home (Kakwani and Subbarao 2005).

The findings on older persons’ living arrangements in West African countries bring into relief four key patterns. First, a majority of older persons in West African countries, ranging from 50 per cent in Ghana to 80 per cent in Senegal, live with at least one of their children (UNPD 2005). These proportions are generally larger than in East and Southern African countries – a situation attributed to the effects of higher HIV/AIDS mortality (and thus a diminished pool of adult children) in the latter sub-regions (Zimmer 2007). Among older West Africans living with child(ren), a sizeable proportion (ranging from 21 per cent in Senegal to around 50 per cent in Burkina Faso), have at least one young child (25 years or less) in their household – indicating possible support obligations:

Second, compared to their counterparts in all other world and SSA sub-regions, older persons in West Africa are much less likely to be living alone or with their spouse only. Only a minority of older people – ranging from 1.3 per cent in Senegal to 11 per cent in Ghana (Mba 2007) – live in single person households, with a further small share (ranging from 1.2 per cent in Senegal to 18 per cent in Mali) residing in couple only households. The prevalence of single person households has in recent decades increased slightly in some nations (Benin, Cote D’Ivoire, Mali) but in others has slightly fallen (Burkina Faso, Niger, Nigeria, Senegal, Ghana) (UNPD 2005).

Third, West African elders are also less likely than those in East, Central or Southern SSA to live in skipped generation households – a pattern again ascribed to effects of the higher HIV/AIDS mortality burden in the other sub-regions (Zimmer 2007). Nonetheless, non-negligible proportions of older persons in West Africa *do* live with grandchildren – ranging from a low of around 8 per cent in Burkina Faso, Nigeria and Senegal to a high of 16 per cent in Ghana. In all countries except Senegal, moreover, the prevalence of such households has increased slightly since the 1990s – pointing to a possibly rising role of grandparents in fostering children (Zimmer 2007; UNPD 2005).

Fourth, a large majority of older persons, in particular older men, are heads of the households in which they live. Among older men, the percentage ranges from 87 per cent in Senegal to 96 per cent in Nigeria, while the proportion of older women ranges from 40 per cent in Senegal to 83 per cent in Ghana. The widespread designation of older persons as household heads likely reflects cultural norms of respect, which demand such recognition of an older household member (irrespective of their possible role as breadwinner) (NPC 2004) as well as patriarchal lines of authority and power.

Lastly, evidence on the distribution of household types shows clear gender differences but less consistent rural/urban or SEP patterns. In most countries single person and skipped generation households are much more prevalent among older women than older men, while older men across all countries are much more likely to live with a spouse only or with children. In all but two countries (Cote D’Ivoire and Senegal) the majority of older men residing with children in fact live only with young children – a pattern that

reflects their likelihood of remarrying younger wives. Rural/urban residence is found to have opposing, or no practical effects across countries. Skipped generation households and residence with at least one child are more common in rural than urban areas in some countries but in others the reverse is the case. Meanwhile, neither rural/urban dwelling, nor educational status has a practical effect on the prevalence of solitary living, except in two countries.¹²

The accumulated findings provide valuable initial insights into basic types and patterns of older persons' living arrangements. Nonetheless, they leave open basic questions regarding (i) the principal factors or processes that determine household formation across countries and (ii) the relationships of living arrangements to older persons' well-being and intergenerational family support. As regards the former, the lack of clear temporal trends and rural/urban or education status patterns in the prevalence of single person households, suggests that modernization theory perspectives – which posit increases in solitary or spouse only living with rising urbanization and education (Burgess and Locke 1954; Goode 1963) – cannot easily explain observed living arrangement patterns across countries. Two alternative perspectives on drivers of household formation exist. One of these emphasizes the force of demographic realities, for example, changes in the “pool” of adult children (e.g. due to declining fertility and/or AIDS) (Kojima 1989). The other asserts a key role of family strategies, which “altruistically” seek to heighten the welfare of the family as a whole, rather than that of individual members (Stark 1991; see Becker 1974). Zimmer (2007) plausibly invokes a role of both factors in driving the heightened prevalence of skipped generation households and the reduced occurrence of older person co-residence with an adult child in countries with a high HIV/AIDS mortality burden. However, inescapable demographic realities and family-welfare strategies might less readily answer questions about the determinants of household formation in non HIV/AIDS contexts. What factors and constraints and whose and what interests, explain the high percentage of older persons co-residing with adult-children and the considerable presence of

skipped generation or, indeed single older person-households in West African societies? At present and in contrast to nascent insights from Southern Africa (Cliggett 2001) we have virtually no evidence to address these queries.

Similarly, we lack insight into how various types of living arrangements relate to older people's receipt or provision of intergenerational family support, or their well-being more broadly. Thus far, older persons living alone are commonly assumed to lack family support, while those living in skipped generation households are believed to face additional support burdens and consequent strain (Mba 2007; Zimmer 2007). However, the limited available data on levels of material well-being associated to different household types, suggest that these assumptions may not always hold. On the one hand, existing evidence *does* lend support to the notion that older persons in single-person and skipped-generation households may be more vulnerable to poverty. Analyses show these two household types to be associated with lower levels of household material well-being, assessed by a score on an inventory of household items and amenities (UNPD 2005). On the other hand, research suggests that results based on such a score-measure (as indicated earlier) may be misleading. Recent analyses based on levels of household income or consumption (Kakwani and Subbarao 2005) in fact consistently find single person households to have a lower incidence of poverty than households in which older persons live with others. However, as these findings are based on measures of aggregate household, rather than individual wealth¹³ they remain problematic.

Attitudes to, and Receipt of, Intergenerational Family Support

While analyses of living arrangements have speculated on associated patterns of intergenerational family support, a small body of recent research in Nigeria and Ghana has examined various aspects of actual support. A number of qualitative, quantitative and ethnographic investigations have focused on exploring older and

¹² In Cote D'Ivoire and Ghana such household formations are more common in rural than in urban areas. In Cote D'Ivoire and in Nigeria, they are more common among older people who have received education (UNPD 2005).

¹³ Aggregate household income, while a better indicator of material resources available for investing in daily well-being, is nonetheless limited as an indicator of older individuals material welfare as it cannot capture the levels and types of intra-household resource allocation to older persons.

younger adults' perceptions and attitudes regarding old age, older people and forms of family support in contemporary society (Akinyemi et al. 2007; Okoye 2004; Van der Geest 1997a, b, 2002). Other studies have (additionally) examined concrete levels or patterns of care and support received by older persons (Gureje et al. 2007; Van der Geest 2004; Aboderin 2004b, 2006a).

The former studies have described a considerable prevalence of ostensibly "non-traditional" attitudes among younger persons regarding, for example the usefulness or "wisdom" of older persons, or the provision of customary forms support (e.g. co-residence) to older parents (Okoye 2004;¹⁴ Akinyemi et al. 2007; Baiyewu et al. 1997). In-depth explorations have provided additional insights into the nature of apparent changes in young persons' attitudes and perceptions (Van der Geest 1997a, b, 2002; Aboderin 2004b, 2006a). Investigations of family support patterns, meanwhile, have consistently highlighted inadequacies in such assistance. Gureje et al. (2006a) showed that 20 per cent of their respondents with functional limitation lack an informal carer – a lack that was associated with an increased likelihood of depression. Van der Geest (2004) showed that older persons in rural Ghana lack emotional support and company specifically from grandchildren, while Aboderin (2004b, 2006a), highlighted deficits in material family support for older persons in urban Ghana. With a few exceptions, most studies – much like the early-phase research on ageing in SSA – have (implicitly or explicitly) taken modernization and ageing theory as a guiding framework. Accordingly, they have interpreted their findings as signifying an eroding status and support for older persons as a result of changes, in particular value shifts, associated with urbanization and modernization. A few studies have additionally noted a possible role of economic hardship in contributing to declines in support. Only one investigation, set in urban Ghana, however, has thus far sought to explore the actual nature and causes of possible changes in family support for older persons, based on an explicit critique of moderniza-

tion and ageing theory (Aboderin 2004a). This study illuminates the complex interrelationships between material and value changes that have led to declines in material family support and that are captured neither by modernization nor by "economic hardship" accounts. At the individual and family level, declines in support are shown to be driven, (i) by a decreasing resource capacity of adult children coupled with a crystallized normative "hierarchy of obligations", which places the needs of the young before those of the old in situations of constrained resources and (ii) by a shift in the "contract" underlying filial support, towards a growing explicit dependence on the principle of reciprocity (i.e., judgments of older parents' past conduct) (Aboderin 2004b, 2005b, 2006a).

Despite the insights generated, there remains a great dearth of evidence on the nature and causes of possible shifts in material but also in other forms of family support, for older persons in both urban and rural settings. Similarly and in contrast to what pertains for Asia (Hermalin 2002; Ofstedal et al. 2004), we lack a basic understanding of: (i) the actual levels and patterns of intergenerational family support provided to and by older people; (ii) how existing levels of support in fact relate to older persons' needs; (iii) the individual, family – or structural (including global) – level factors and arrangements that shape these patterns.

Conclusion

A basic task for contemporary research on ageing in West Africa, as indicated in the first part of this chapter, is to develop a sound understanding and explanation of older persons' present situations and levels of well-being and to forge effective conjectures for the future. Both are required to advance African scientific and policy debates on ageing. The above review clearly shows that, while a considerable body of empirical evidence on older people's health, economic, residential and family support situation has accumulated, West African research has largely failed to address this task. Many studies have explored socio-demographic correlates of older people's status, have identified various gender, rural/urban and SEP patterns and disparities and, at times, have speculated on underlying determinants. However, they have provided few insights into causative factors and processes that act contemporaneously or over the life course, nor

¹⁴ Okoye (2004) quantitatively explored the level of younger persons' endorsement of very general normative questions such as "Do children have a special responsibility to look after their parents". Such an approach has serious limitations, as a real understanding of the norms requires insights into how general rules are interpreted in specific settings, with specific kin persons (see Marshall et al. 1987).

have they explored possible future trends and developments. Similarly, research has generated little evidence on how older persons' economic, health and family circumstances in fact relate to their well-being – both to objective levels and subjective perceptions of welfare. Indeed, most research thus far has inferred, rather than explored, implications for well-being.

This concluding section highlights a range of key approaches – regarding substantive research areas and methodology – that West African research needs to embrace if it is to illuminate the following core unanswered questions: how have current patterns and inequalities in older persons' health, economic, family support status and well-being evolved? How do they impact quality of life? What is to be expected for future cohorts?

First, representative studies and comparative analyses of national or sub-national populations of older persons are needed. The only investigation providing representative population data to date is the Ibadan Study of Ageing (ISA), which is representative of the Yoruba population in South Western Nigeria (Gureje et al. 2006b, 2007). Also required are efforts to generate longitudinal data. Concrete opportunities for the timely production of such evidence are provided by the planned extension of the ISA (Gureje 2007, personal communication) and by several other current initiatives in SSA. One is the World Health Organization Study on Global Ageing and Adult Health (WHO SAGE), which has already generated pilot data for Ghana (WHO 2008). A further example is the program of demographic and health research (specifically the work on adult health and ageing) undertaken by the INDEPTH network among defined developing country populations. Twelve of the 26 INDEPTH field sites are in West Africa, distributed over 5 countries (Burkina Faso, The Gambia, Ghana, Guinea-Bissau and Senegal) (INDEPTH 2008). The longer term calls for the establishment and maintenance of birth-cohort studies in West African population, much like the seminal "Birth to Twenty Study" in South Africa (Richter et al. 2007).

Second, quantitative surveys need to be complemented and informed by much more careful and critical qualitative exploration (Creswell 2003; Denzin and Lincoln 2003). This must illuminate older men's and women's present and earlier-life perspectives and conceptions regarding health, household formation, work and family support and how these relate to their broader

family and structural contexts including salient influences of globalization (Calasanti 2004; Giddens 1991; Ryff 1986; Marshall 1986; Phillipson 2006; Guba and Lincoln 1994). In this regard, increased attention ought to be paid to impacts of growing domestic migration in, and international migration from, West Africa (Black et al. 2004; Aboderin 2005c). There is a specific requirement for qualitative insights to support the possible development of sensitive and locally appropriate survey measures or indicators, for example, for older individuals' material well-being or health status. The former must capture patterns and principles of intra-household resource allocation to and from older persons (Sen 1983; Aboderin 2006a), while the latter must clarify the relevance of self-ratings of health or disability and of standard diagnostic criteria especially for mental disease. To this end, research needs to generate understandings of local cultural (and possibly life-stage specific) conceptions of (i) what (good) "health" and function in old age entails, (ii) the nature of emotions, behaviors and thought (in old age); and (iii) chronic or acute disease conditions (Muscovici and Duveen 2000). An in-depth investigation of these issues is ongoing in Nigeria (Aboderin 2006b).

A further, crucial measure to be developed concerns older persons' quality of life (QoL). Both the Madrid International and the African Union Plan of Action on Ageing posit improvements in QoL as key endpoints for policy on ageing (UN 2002; AU/HAI 2003). Yet neither plan clarifies what QoL entails for older (West) Africans. Only a handful of recent studies (Gureje et al. 2006a, b, 2007) have explored levels of QoL among older persons, employing the standard WHOQoL-BREF instrument. This instrument, however, has two important limitations. First, it is intended for use in general adult populations, prompting the development of a new, older person-specific instrument (WHOQOL-OLD) (Power, et al. 2005). Second and crucially, neither instrument (nor any of the other currently available tools) is based on older persons' own conceptions of what quality of life in old age is in (West) Africa. Recent international debates have highlighted the vital importance of considering such lay theories in building incisive survey tools to measure QoL (Bowling 2007; Mollenkopf and Walker 2007; Nilsson et al. 2005). Yet and in contrast to the burgeoning Asian and developed world research (Bowling 2007; Bowling and Gabriel 2007; Nilsson et al. 2005), this area remains virtually unexplored in SSA. However, initial conceptual and empirical explorations are emerg-

ing (Aboderin and Ferreira 2008; Aboderin 2006b). A final requirement for West African research is to embrace a focus on younger age-groups. This is needed both to illuminate the situation of older persons relative to the young and to truly examine ageing processes and their likely impacts for old age.

Acknowledgements The research for this chapter was supported by The Wellcome Trust, UK. (Grant No: WT078866MA)

References

- Aboderin I (2004a) Modernisation and ageing theory revisited: Current explanations of recent developing world and historical western shifts in material family support for older people. *Ageing Soc* 24:29–50
- Aboderin I (2004b) Decline in material family support for older people in urban Ghana, Africa: Understanding processes and causes of change. *J Gerontol: Psychol Sci, Soc Sci* 59: S128–S137
- Aboderin I (2005a) Understanding and responding to aging in sub-Saharan Africa. A strategic framework and plan for research. Report, Oxford Institute of Ageing, University of Oxford, UK
- Aboderin I (2005b) “Conditionality” and “Limits” of filial obligation: Conceptual levers for developing a better understanding of the motivational basis and societal shifts or patterns in old age family support. Oxford Institute of Ageing Working Paper No. 604, Oxford
- Aboderin I (2005c) Migration rationales and impacts among Nigerian nurses working in the UK eldercare sector: Implications for old age and intergenerational support in their families. A preliminary analysis. Paper presented at the 34th annual conference of the British Society of Gerontology, July 14–16, Keele
- Aboderin I (2006a) Intergenerational support and old age in Africa. Transaction Publishers, Piscataway, NJ
- Aboderin I (2006b) Dimensions and social determinants of health in old age in Nigeria and Kenya. Wellcome trust funded research project, Grant No: WT078866MA, Wellcome Trust, UK
- Aboderin I (2007) Development and ageing policy in sub-Saharan Africa: Approaches for research and advocacy. *Global Ageing* 4(3):7–22
- Aboderin I, Ferreira M (2008) Linking ageing to development agendas in sub-Saharan Africa: Challenges and approaches. World Demographic Association discussion paper series World Demographic Association, St.Gallen, Switzerland
- African Union/Help Age International (AU/HAI) (2003) The African policy framework and plan of action on ageing. Help Age International Africa regional development centre, Nairobi, Kenya
- Agyemang C (2006) Rural and urban differences in blood pressure and hypertension in Ghana, West Africa. *Public Health* 120:525–533
- Ainsworth M, Dayton J (2003) The impact of the AIDS epidemic on the health of older persons in Northwestern Tanzania. *World Dev* 31:131–148
- Akinyemi IA, Adepoju OA, Ogunbameru AO (2007) Changing philosophy for care and support for the elderly in South-western Nigeria. *Bold* 18(1):18–23
- Apt NA (1987) Aging, health, and family relations: A study of aging in the central region of Ghana. University of Ghana, Legon
- Apt NA (1996) Ageing in Ghana. review studies. Centre for social policy studies, University of Ghana, Legon
- Apt NA (1997) Ageing in Africa. World Health Organization, Geneva
- Apt NA, Grieco M (1994) Urbanisation, caring for the elderly and the changing African family: The challenge to social welfare and social policy. *Int Soc Secur Rev* 48:111–122
- Apt N, Koomson J, Williams N, Grieco M (1995) Family finance and doorstep trading: Social and economic well-being of elderly Ghanaian female traders Southern African. *J Gerontol* 4:17–24
- Baars J, Dannefer D, Phillipson C, Walker A (2006) Aging, globalization and inequality. *The New Critical Gerontology*. Amityville, Baywood
- Baiyewu O, Bella AF, Adeyemi JD, Bamgboye EA, Jegede RO (1997) Health problems and socio-demographic findings in elderly Nigerians. *Afr J Med Sci* 26:13–17
- Bakare OE, Ojofeitimi EO, Akinyemi A (2004) Nutritional assessment and health status of the elderly in Southwestern Nigeria. Paper presented at the Union for African Population Studies (UAPS) African Conference on Ageing 18–20 August 2004, Johannesburg. www.uaps.org.
- Banks J, Marmot M, Oldfield Z, Smith J (2007) The SES health gradient on both sides of the Atlantic IFS Working Papers W07/04, Institute for Fiscal Studies, London
- Bass JK, Bolton PA, Murray LK (2007) Do not forget culture when studying mental health. *Lancet* 370:919–919
- Beaglehole R, Bonita R (2004) Public health at the crossroads: Achievements and prospects. 2nd edn. Cambridge University Press, Cambridge
- Becker G (1974) A theory of social interactions. *J Pol Econ* 82:1063–1093
- Birdsall N, Kelley AC, Sinding S (2001) Population matters: Demographic change, economic growth and poverty in the developing world. Oxford University Press, Oxford
- Black R, Ammassari S, Mouillesseaux S, Rajkotia R (2004) Migration and pro-poor policy in West Africa Sussex centre for migration research. Working Paper C8, University of Sussex
- Börsch-Supan A (2001) Labour market effects of population aging. National Bureau of Economic Research (NBER) Working Paper no 8640. <http://www.nber.org/papers/w8640>
- Bolton P (2001) Cross-cultural validity and reliability testing of a standard psychiatric assessment instrument without a gold standard. *J Nerv Ment Dis* 189:238–242
- Bongaarts J (2005) The causes of stalling fertility transitions policy research division. Working Paper No 204, Population Council, United Nations, New York. www.popcouncil.org/publications/wp/prd/rdwplst.html
- Bos AM, Bos AJ (2007) The socioeconomic determinants of older people’s health in Brazil. The importance of marital status and income. *Ageing Soc* 27:385–406
- Bowling A (2007) Quality of life in older age: What older people say. In: Mollenkopf H, Walker A (eds) Quality of life in old age. International and multidisciplinary perspectives. Springer, Dordrecht, pp 15–32

- Bowling A, Gabriel Z (2007) Lay theories of quality of life in older age. *Ageing Soc* 27:827–848
- Bramucci G, Erb S (2007) An invisible population: Displaced older people in West Darfur. *Global Ageing* 4(3):23–34
- Brown CK (1985) Research findings in Ghana: A survey on the elderly in the Accra Region. *African Gerontol* 4:11–37
- Burgess EW (ed) (1960) *Ageing in western societies*. University of Chicago Press, Chicago
- Burgess EW, Locke HJ (1954) *The family*. American Book Company, New York
- Calasanti T (2004) Feminist gerontology and old men. *J Gerontol: Soc Sci* 59B:S305–314
- Caldwell JC, Findley S, Caldwell P, Santow G, Cosford W, Braid J, Broers-Freeman D (eds) (2001) What we know about health transition: The cultural, social and behavioural determinants of health. Health transition Series, No. 2, Health Transition Centre, Australian National University
- Campbell C (1994) Intergenerational conflicts in township families: Transforming notions of respect and changing power relations. *South Afr J Gerontol* 3:37–42
- Campbell M, Cleland J, Ezeh A, Prata N (2007) Return of the population growth factor. *Science* 315:1501–1502
- Carroll JF, Chiapa AL, Rodriguez M, Phelps DR, Cardarelli KM, Vishwanatha JK, Bae S, Cardarelli R (2008) Visceral fat, waist circumference and BMI: Impact of race/ethnicity. *Obesity* (Silver Spring) Epub ahead of print, January 17
- Cattell M (1997a) Ubuntu, African elderly and the African family crisis. *South Afr J Gerontol* 6:37–39
- Cattell M (1997b) The discourse of neglect: Family support for elderly in Samia. In: Weisner TS et al. (eds) *African families and the crisis of social change*. Bergin and Garvey, Westport, CT and London, pp 157–183
- Cattell M (1999) Gender, ageing, and health among the Samia of Kenya. Report of the Third African Region Workshop of the African Gerontological Society (AGES). Nairobi, Kenya, April 12–16th 1999, pp 103–122
- Cleland J, Bernstein S, Eze A, Faundes A, Glasier A, Innis J (2006) Family planning: The unfinished agenda. *Lancet* 368:1810–1827
- Cliggett L (2001) Survival strategies of the elderly in Gwembe Valley, Zambia: Gender, residence and kin networks. *J Cross Cult Gerontol* 16:309–332
- Cohen B, Menken J (2006) Report. In: Cohen B, Menken J (eds) *Ageing in sub-Saharan Africa: Recommendations for furthering research*. The National Academies Press, Washington, DC. <http://www.nap.edu/catalog/11708.html>
- Commission for Africa (CfA) (2005) *Our common interest*. Report of the commission for Africa. Commission for Africa Secretariat, London
- Cowgill DO (1972) A theory of aging in cross-cultural perspective. In: Cowgill DO, Holmes LD (eds) *Ageing and modernization*, Appleton-century-crofts, New York, pp 1–14
- Cowgill DO (1974) *Ageing and modernization: A revision of the theory*. In: Gubrium JF (ed) *Late Life*. Thomas, Springfield, IL, pp 123–145
- Creswell JW (2003) *Research design. quantitative, qualitative and mixed method approaches*, 2nd edn. Newbury Park, Sage
- Dayton J, Ainsworth M (2004) The elderly and AIDS: Coping with the impact of adult death in Tanzania. *Soc Sci Med* 59:2161–2172
- DeGraft-Aikins A (2005) Healer shopping in Africa: New evidence from rural-urban qualitative study of Ghanaian diabetes experiences. *BMJ* 331:737–744
- DeLehr EC (1992) Aging and family support in Mexico. In: Kendig HL et al. (eds) *Family support to the elderly: The international experience*, Oxford University Press, Oxford, pp 215–23
- Denzin NK, Lincoln YS (2003) Introduction: The discipline and practice of qualitative research. In: Denzin NK, Lincoln YS (eds) *The landscape of qualitative research. Theories and issues*, 2nd edn. Thousand Oaks, Sage, CA, pp 1–45
- Department for International Development (DFID) (2004) *Nigeria country assistance plan 2003–2007*. DFID, Nigeria, Abuja
- Donkor K (1995) Ghana: Structural adjustment and its impact on the incidence of mass poverty. Ph.D. Dissertation, School for Policy Studies, University of Bristol
- Dorjahn VR (1989) Where do the old folks live? The residence of the elderly among the Temne of Sierra Leone. *J Cross Cult Gerontol* 4:257–278
- Draguns JG, Tanaka-Matsumi J (2003) Assessment of psychopathology across and within cultures: Issues and findings. *Behav Res Ther* 41:755–776
- Ekpenyong S, Oyene O, Peil M (1987) Health problems of elderly Nigerians. *Soc Sci Med* 24:885–888
- Ekpenyong S, Peil M (1985) Old age in town: Implications for housing and services. *Afr Urban Stud* 21:15–23
- Everatt D, Orkin M (1994) Families should stay together: Intergenerational attitudes among South African youth. *South Afr J Gerontol* 3:43–48
- Fafowora OF, Osuntokun OO (1997) Age-related eye disease in the elderly members of rural African community. *East Afr Med J* 74:435–437
- Ferguson BD, Tandon A, Gakidou E et al (2003) Estimating permanent income using indicator variables. In: Murray CJL, Evans DB (eds) *Health systems performance assessment: Debates, methods and empiricism*. World Health Organization, Geneva
- Ferreira M (1999) Building and advancing African gerontology. *South Afr J Gerontol* 8:1–3
- Ferreira M (2005) Research on ageing in Africa: What do we have, not have and should we have? *Generations Rev* 15:32–35
- Ferreira M (2006a) The differential impacts of social pension income on poverty alleviation in three South African ethnic groups. *Ageing Soc* 26:337–354
- Ferreira M (2006b) HIV/AIDS and older people in sub-Saharan Africa: Towards a policy framework. *Global Ageing* 4(2):56–71
- Ferreira M, Kowal P (2006) A minimum data set on ageing and older persons in sub-Saharan Africa: Processes and outcome. *Afr Popul Stud* 21(1):19–36
- Ferreira M, Møller V, Prinsloo FR, Gillis LS (1992) Multidimensional survey of elderly South Africans 1990–1991: Key findings. Cape Town: HSR/UCT, Centre for Gerontology
- Foner N (1993) When the contract fails: Care for the elderly in nonindustrial cultures. In: Bengtson VL, Achenbaum WA (eds) *The changing contract across generations*, Aldine de Gruyter, New York, pp 101–117

- Freedman VA, Martin LG, Schoeni RF, Cornman JC (2008) Declines in late-life disability: The role of early- and mid-life factors. *JAMA* 25 January Epub ahead of print
- Fries JF (1980) Aging, natural death, and the compression of morbidity. *New Engl J Med* 303:130–135
- George BS (1976) Education in Ghana. US Government Printing Office, Washington
- Giddens A (1991) Modernity and self identity. Polity Press, Oxford
- Glew RH, Conn CA, Vanderjagt TA, Calvin CD, Obadofin MO, Crossey M, Vanderjagt DJ (2004) Risk factors for cardiovascular disease and diet of urban and rural dwellers in Northern Nigeria. *J Health Popul Nutr* 22:357–369
- Goldstein, MC, Schuler, S, Ross JL (1983) Social and economic forces affecting intergenerational relations in a third world country: A cautionary tale from South Asia. *J Gerontol* 38:716–724
- Goode WJ (1963) World revolution in family patterns. Free Press, New York
- Gruenberg EM (1977) The failure of success. *Milbank Mem Fund Q Health Soc* 55:3–24
- Guba EG, Lincoln YS (1994) Competing paradigms in qualitative research. In: Denzin NK, Lincoln YS (eds) *Handbook of qualitative research*. Thousand Oaks, Sage, CA, pp 105–117
- Gureje O, Kola L, Afolabi E (2007) Epidemiology of major depressive disorder in elderly Nigerians in the Ibadan study of ageing: A community-based survey. *Lancet* 370:9591:957–964
- Gureje O, Ogunniyi A, Kola L, Afolabi E (2006a) Functional disability in elderly Nigerians: Results from the Ibadan study of ageing. *J Am Geriatr Soc* 54:1784–1789
- Gureje O, Ogunniyi A, Kola L (2006b) The profile and impact of probable dementia in a sub-Saharan African community: Results from the Ibadan study of aging. *J Psychosom Res* 61(3):327–333
- Harper S (2006) Ageing societies. Hodder Arnold, London
- Hashimoto A, Kendig HL (1992) Aging in international perspective. In: Kendig HL, Coppard LC, Hashimoto A (eds) *Family support to the elderly*. Int Exp. Oxford University Press, Oxford, pp 3–13
- Hermalin AI (2002) The well-being of the elderly in Asia. A four country comparative study. University of Michigan Press, Ann Arbor
- Hosegood V, Timaeus IM (2006) HIV/AIDS and older people in South Africa. In: Cohen B, Menken J (eds) *Aging in sub-Saharan Africa: Recommendations for furthering research*. The National Academies Press, Washington, DC. <http://www.nap.edu/catalog/11708.html>
- Howse K (2006) Increasing life expectancy and the compression of morbidity: A critical review of the debate oxford institute of ageing. Working Paper No.26, Oxford Institute of Ageing, University of Oxford
- Ingstad B, Bruun FJ, Tlou S (1997) AIDS and the elderly Tswana: The concept of pollution and consequences for AIDS prevention. *J Cross Cult Gerontol* 12:357–372
- INDEPTH (2008) <http://www.indepth-network.org/>
- Isiugo-Abanihe U (2002) Child fosterage in West Africa. *Popul Dev Rev* 11:53–73
- Jatrana S, Chan A (2007) Do socioeconomic effects on health diminish with age? A Singapore case study. *J Cross Cult Gerontol* 22:287–301
- Johnson ML (2005) General editor's preface. In: Johnson ML, Coleman PG, Kirkwood TBL (eds) *The Cambridge handbook of age and ageing*. Cambridge, CUP, pp 21–26
- Kahn S, Tollman S, Thorogood M, Connor M, Garenne M, Collinson M, Hundt G (2006) Older adults and the health transition in Agincourt, rural South Africa: New understanding, growing complexity. In: Cohen B, Menken J (eds) *Aging in sub-Saharan Africa: Recommendations for furthering research*. The National Academies Press, Washington, DC. <http://www.nap.edu/catalog/11708.html>
- Kakwani N, Subbarao K (2005) Ageing and poverty in Africa and the role of social pensions. UNDP international poverty centre, Working Paper No.8, UNDP, New York
- Kaneda T, Zimmer Z (2007) Education, gender, and functional transitions among Indonesian elderly. *J Cross Cult Gerontol* 22:303–322
- Kaufman JS, Owoaje EE, James SA, Rotimi CN, Cooper RS (1996) Determinants of hypertension in West Africa: Contribution of anthropometric and dietary factors to rural-urban gradients. *Am J Epidemiol* 143:1203–1218
- Keith J, Fry CL, Glascock AP, Ikels C, Dickerson-Putman J, Harpending HC, Draper P (1994) The aging experience. Diversity and commonality across cultures. Thousand Oaks, Sage
- Knodel J, Watkins S, VanLandingham M (2003) AIDS and older persons: An international perspective. *J Acquir Immune Defic Syndr and Human Retrovirol* 33(Suppl 2):S153–S165
- Knodel J, Zimmer Z, Kim KS, Puch S (2007) The effect on elderly parents in Cambodia of losing an adult child to AIDS. *Popul Dev Rev* 33:479–500
- Kojima H (1989) Coresidence of young adults with their parents in Japan: Do sib size and birth order matter? *J Popul Stud* 13:15–25
- Kowal PR, Dowd JE, Aboderin IAG, Madzingira N (2002) Data for older adult populations in sub-Saharan Africa. *Lancet* 360:91
- Kramer M (1980) The rising pandemic of mental disorders and associated chronic diseases and disabilities. *Act Pschiatr Scand* 62 (Suppl 285):282–297
- Kuate-Defo B (2006) Interactions between socioeconomic status and living arrangements in predicting gender-specific health status among the elderly in Cameroon. In: Cohen B, Menken J (eds) *Aging in Sub-Saharan Africa: Recommendations for furthering research*. Washington, The National Academies Press. <http://www.nap.edu/catalog/11708.html>
- Kuepie M (2007) The socioeconomic implications of ageing in Africa: Labour market participation and alternative sources of income. Paper presented at the international conference: Population ageing: Towards an improvement of the quality of life. Brussels, 1 March 2007
- Kuhn R, Rahman O, Menken J (2006) Survey measures of health: How well do self-reported and observed indicators measure health and predict mortality. In: Cohen B, Menken J (eds) *Aging in sub-Saharan Africa: Recommendations for furthering research*. The National Academies Press, Washington, DC. <http://www.nap.edu/catalog/11708.html>
- Lawayin TO, Asuzu MC, Kaufman J, Rotimi C, Owoaje E, Johnson L, Cooper R (2002) Prevalence of cardiovascular risk factors in an African urban inner city community. *West Afr J Med* 21:208–211
- Lee R (2003) The demographic transition. Three centuries of fundamental change. *J Econ Perspect* 17:176–190

- Manton KG (1982) Changing concepts of morbidity and mortality in the elderly population. *Milbank Memorial Fund Quarterly Health Soc* 60:183–244
- Marmot M, Wilkinson RG (eds) (2006) *Social determinants of health*. Oxford University Press, Oxford
- Marshall VW (1986) Dominant and emerging paradigms in the social psychology of aging. In: Marshall VW (ed) *Later life: The social psychology of aging*, Beverly Hills, Sage, CA, pp 9–31
- Marshall VW (1990) WHO health policy and United Nations aging policy: An analysis. Paper presented at international sociological Association Meetings, XII, World Congress of Sociology, Madrid, Spain
- Marshall VW, Heinz W, Krueger H, Verma A (eds) (2001) *Restructuring work and the life course*. University of Toronto Press, Toronto
- Marshall VW, Rosenthal CJ, Daciuk J (1987) Older parents' expectations for filial support. *Social Justice Review* 1:405–424
- Mba CJ (2007) Population ageing in Ghana and correlates of support availability. *Gerontechnology* 6(2):102–111
- Mba CJ (2006) The health condition of older women in Ghana: A case study of Accra city. *J Int Women's Stud* 8(1):176–189
- Mba CJ (2004) Population ageing and survival challenges in rural Ghana. *J Soc Dev Afr* 19(2):90–112
- McIntyre D (2004) Health policy and older people in Africa. In: Lloyd-Sherlock P (ed) *Living longer. Ageing, development and social protection*. Zed Books, London and New York, pp 160–183
- Merli MG, Palloni A (2006) The HIV/AIDS epidemic, kin relations, living arrangements and the African elderly in South Africa. In: Cohen B, Menken J (eds) *Ageing in sub-Saharan Africa: Recommendations for furthering research*. The National Academies Press, Washington, DC, <http://www.nap.edu/catalog/11708.html>
- Mitter S, Rowbotham S (1995) *Women encounter technology. Changing patterns of employment in the third world*. Routledge, New York
- Mollenkopf H, Walker A (2007) Quality of life in old age: Synthesis and future perspectives. In: Mollenkopf H, Walker A (eds) *Quality of life in old age. International and multidisciplinary perspectives*. Springer, Dordrecht, pp 235–252
- Møller V (1994) Intergenerational relations in a society in transition: A South African case study. *Ageing and Society* 14:155–189
- Møller V, Sotshongaye A (1996) My family eat this money too: Pension sharing and self-respect among Zulu grandmothers. *South Afr J Geront* 5:9–19
- Mostafa G van, Ginneken JK (2000) Trends in and determinants of mortality in the elderly population in Matlab, Bangladesh. *Soc Sci Med* 50:763–771
- Muscovici S, Duveen G (2000) *Social representations. Explorations in social psychology*. University Press, New York
- Nigeria Population Commission (NPC) (2004) *The elderly: Nigeria population census analysis*. NPC, Abuja, Nigeria
- Nilsson J, Grafstroem M, Zaman S, Kabir ZN (2005) Role and function: Aspects of quality of life of older people in Bangladesh. *J Aging Stud* 19:363–374
- Notestein FW (1945) Demographic studies of selected areas of rapid growth. In: *Proceedings of the round table on population problems*. 22nd Annual Conference of the Milbank Memorial Fund. Milbank Memorial Fund, New York
- Ntozi JPM, Ahimbisbwe FE, Odwee JO, Ayiga N, Okurut F (1999) Orphan care: The role of the extended family in Northern Uganda. In: Orubuloye IO et al. (eds) *The continuing HIV/AIDS epidemic in Africa: Responses and coping strategies*. Australian National University Press, pp 225–236
- Nugent P (2004) *Africa since independence*. Palgrave Macmillan, Basingstoke
- Nwosu SN (2000) Low vision in persons aged 50 and above in the onchocercal endemic communities of Anambra state. *Nigeria West Afr J Med* 19:216–219
- Nyanguru AC, Hampson J, Adamchak DJ, Wilson AO (1994) Family support to the elderly in Zimbabwe. *S Afr J Gerontol* 3:22–26
- Nyanguru AC, Peil M (1993) Housing and the elderly in Zimbabwe. *So Afr J Gerontol* 2:3–9
- Odoro AD, Aryee I (2003) Investigating chronic poverty in West Africa. *Chronic Poverty Research Centre Working Paper No. 28*, CPRC. http://www.chronicpoverty.org/pdfs/28Odoro_Aryee.pdf
- Ofstedal MB, Reidy E, Knodel J (2004) Gender differences in economic support and well-being among older Asians. *J Cross Cult Gerontol* 19:165–201
- Ofstedal MB, Zimmer Z, Hermalin AI, Chan A, Chuang Y-L, Natividad J, Tang Z (2007) Short-term trends in functional limitation and disability among older Asians: A comparison of five Asian settings. *J Cross Cult Gerontol* 22:243–261
- Ogunniyi A, Aboderin I (2007) Hospital-based care of patients with dementia in Ibadan, Nigeria: Practice, policy contexts and challenges. *Global Ageing* 4(3):45–54
- Ogunniyi AO, Osuntokun BO (1993) Determination of ages of elderly Nigerians through historical events: Validation of Ajayi-Igun. *W Afr J Med* 12:189–190
- Oguntona CR, Kuku O (2000) Anthropometric survey of the elderly in South Western Nigeria. *Ann Hum Biol* 27:257–262
- Ogwumie FO (2001) An appraisal of poverty and poverty reduction strategies in Nigeria. *Central Bank of Nigeria Economic and Financial Review* 39:45–71
- Ohuche NM, Littrell JM (1989) Igbo students' attitudes towards supporting aged parents. *Int J Aging Human Dev* 29:259–267
- Okoye UO (2004) The erosion of traditional forms of care for the elderly and its implication for the elderly in Nigeria. Paper presented at the Union for African Population Studies (UAPS) African conference on ageing, August 18–20 2004, Johannesburg. www.uaps.org
- Olayiwola IO, Ketiku AO (2006) Socio-demographic and nutritional assessment of the elderly Yorubas in Nigeria. *Asia Pac J Clin Nutr* 15:95–101
- Olshansky SJ, Ault EB (1986) The fourth stage of the epidemiological transition: The age of delayed degenerative disease. *Milbank Memorial Fund Quarterly* 64:355–391
- Omran AR (1971) The epidemiological transition: A theory of epidemiology of population change. *Milbank Memorial Fund Quarterly* 49:509–538
- Omran AR (1982) Epidemiological transition. In: Ross JA (ed) *International encyclopaedia of population*. Free press, London, pp 172–183

- O'Rand AM (1990) Stratification and the life course. In: Binstock RH, George LK (eds) *Handbook of aging and the social sciences*, 3rd edn Academic Press, San Diego, pp 130–148
- Palloni A, McEniry M (2007) Aging and health status of elderly in Latin America and the Caribbean: Preliminary findings. *J Cross Cult Gerontol* 22:263–285
- Palloni A, Pelaez M, Wong R (2006) Ageing among Latin American and Caribbean populations. *J Ageing and Health* 18:149–156
- Parahyba MI, Veras R, Melzer D (2005) Disability among elderly women in Brazil. *Revista Saude Publica* 39:383–390
- Peil M, Bamisaiye A, Ekpenyong S (1989) Health and physical support for the elderly in Nigeria. *J Cross Cult Gerontol* 4:89–106
- Phillipson C (2006) Aging and globalization: Issues for critical gerontology and political economy. In: Baars J et al. (eds) *Aging, globalization and inequality*. Amityville, Baywood, New York, pp 43–58
- Power M, Quinn K, Schmidt S, the WHO QOL Group (2005) Development of the WHOQOL OLD Module. *Quality of Life Research* 14:2197–2214
- Richter L, Norris S, Pettifor J, Yach D, Cameron N (2007) Cohort profile: Mandela's children: The 1990 birth to twenty study in South Africa. *Int J Epidemiol* 36:504–511
- Robertson CC (1981) *Sharing the same bowl: A socio-economic history of women and class in Accra, Ghana*. Indiana University Press, Bloomington
- Robine J-M, Michel J-P (2004) Looking forward to a general theory on population aging. *J Gerontol Med Sci* 59A(6):590–597
- Ruggles S (2001) Living arrangements and economic well-being of the aged in the past. *Population Bulletin of the United Nations* 42/43:111–61
- Ryff CD (1986) The subjective construction of self and society: An agenda for life span research. In: Marshall VW (ed) *Later life: The social psychology of aging*, Beverly Hills, Sage, CA
- Sagner A, Mti RZ (1999) Politics of pension sharing in South Africa. *Ageing and Society* 19:393–416
- Salomon JA, Tandon A, Murray CJL (2004) Comparability of self-rated health: Cross-sectional multicountry survey using anchoring vignettes. *BMJ* 328:258–63
- Sangree WH (1992) Grandparenthood and modernisation: The changing status of male and female elders in Tiriki, Kenya and Irigwe, Nigeria. *J Cross Cult Gerontol* 7:331–361
- Sen A (1983) Economics and the family. *Asian Dev Rev* 1:14–26
- Shapiro E, Kaufert J (1983) The role of international conferences – a theoretical framework. *Can J Aging* 2:43–9
- Siegrist J, Marmot M (eds) (2007) *Social inequalities in health: New evidence and policy implications*. Oxford University Press, Oxford
- Soludo CC, Mkwandawire T (1999) *Our continent. Our future. African perspectives on structural adjustment*. IDRC/CODESRIA/Africa World Press
- Stark O (1991) *The migration of labour*. Cambridge, Basil Blackwell
- Tibbitts C (ed) (1960) *Handbook of social gerontology*. University of Chicago Press, Chicago
- Togonu-Bickersteth F (1989) Conflicts over caregiving: Discussion of filial obligation among adult Nigerian children. *J Cross Cult Gerontol* 4:35–48
- Togonu-Bickersteth F, Akinnawo EO (1990) Filial responsibility expectations of Nigerian and Indian university students. *J Cross Cult Gerontol* 5:315–332
- United Nations (1982) *Report of the world assembly on aging*. Vienna, 26 July – 6 August. New York, United Nations
- United Nations (2000) *Millennium Declaration*. A/RES/55/2 18 September, New York
- United Nations (2002) *Report of the Second World Assembly on Ageing*. UN, New York
- UNAIDS/World Health Organization (UNAIDS/WHO) (2006) *AIDS epidemic update: December 2006*. A report of the joint United Nations programme on HIV/AIDS (UNAIDS) and the WHO. UNAIDS and WHO, Geneva
- United Nations Department of Economic and Social Affairs (UN/DESA) (2007a) *The millennium development goals report 2007*. New York, UN. <http://www.un.org/millenniumgoals/pdf/mdg2007.pdf>
- United Nations Department of Economic and Social Affairs (UN/DESA) (2007b) *Millennium development goals. 2007 progress chart*. New York, UN. <http://www.un.org/millenniumgoals/pdf/mdg2007-progress.pdf>
- United Nations Development Programme (UNDP) (2006) *Palgrave Macmillan for UNDP*, New York. <http://hdr.undp.org/hdr2006/>
- United Nations Population Division (UNPD) (2005) *Living arrangements of older persons around the world*. UNPD, New York
- United Nations Population Division (UNPD) (2006) *Population ageing 2006 chart*. UNPD, New York
- United Nations Population Division (UNPD) (2007) *World population ageing 2007*. United Nations, New York. www.un.org/esa/population/publications/WPA2007/ES-English.pdf
- United Nations Population Division (UNPD) (2008) *World population prospects: The 2006 revision*. UNPD, New York. <http://esa.un.org/unpp/> Accessed on January 8
- Uwakwe R, Modebe I (2007) Community and family care responsibilities for persons with dementia in Eastern Nigeria. *Global Ageing* 4(3):35–44
- Van der Geest S (1997a) Between respect and reciprocity: Managing old age in rural Ghana. *S Afr J Gerontol* 6:20–25
- Van der Geest S (1997b) Money and respect: The changing value of old age in rural Ghana. *Africa* 67(4):534–59
- Van der Geest S (2002) Respect and reciprocity: Care of elderly people in rural Ghana. *J Cross Cult Gerontol* 17:3–31
- Van der Geest S (2004) They don't come to listen: The experience of loneliness among older people in Kwahu, Ghana. *J Cross Cult Gerontol* 19(2):77–96
- Vaupel JW, Carey JR, Christensen K (1998) Biodemographic trajectories of longevity. *Science* 280:855–860
- Velkoff VA, Kowal PR (2007) *Population ageing in sub-Saharan Africa: Demographic dimensions 2006*. U.S. Census Bureau, Current Population Reports, P 95/07-1, U.S. Government Printing office, Washington, DC
- Waite LJ (2005) The demographic face of the elderly. In: Waite LJ (ed) *Aging, health and public policy: Demographic and economic perspectives*. (Suppl. to *Population and Development Review* vol. 30). Population Council, New York, pp 3–18
- Walker A, Mollenkopf H (2007) International and multidisciplinary perspectives on quality of life in old age: Conceptual issues. In: Mollenkopf H, Walker A (eds) *Quality of life in*

- old age. International and multidisciplinary perspectives. Dordrecht: Springer, pp 3–14.
- Westoff CF, Cross AR (2006) The stall in the fertility transition in Kenya. DHS analytical studies, No. 9; ORC Macro, Calverton, Maryland. www.measuredhs.com/pubs/pdf/AS9/AS9.pdf
- White KM (2002) Longevity advances in high-income countries 1955–1996. *Popul Dev Rev* 28:59–76
- World Bank (2007) Country classification. <http://go.worldbank.org/K2CKM78CC0> Accessed on July 4, 2007
- World Bank (2006) World development report 2007: Development and the next generation. World Bank, Washington, DC
- World Health Organization (WHO) (2002) Impact of aids on older people in Africa: Zimbabwe case study. WHO, Geneva
- World Health Organization (WHO) (2004) World health report 2004. WHO, Geneva
- World Health Organization (WHO) (2006) The health of the people. The African regional health report. WHO Regional Office for Africa, Brazzaville
- World Health Organization (WHO) (2008) WHO study on global ageing and adult health (SAGE). General information and objectives. WHO, Geneva. www.who.int/healthinfo/systems/sage/en/index.html
- Zimmer Z (2007) HHIV/AIDS and the living arrangements of older persons across the sub-Saharan African region. Institute of Public and International Affairs (IPIA) Working Paper 2007-11-21, IPIA, University of Utah. www.ipia.utah.edu/workingpapers.html
- Zimmer Z, Martin LG (2007) Key topics in the study of older adult health in developing countries that are experiencing population aging. *J Cross Cult Gerontol* 22:235–241

Chapter 13

Demography of Aging in Arab Countries

Kathryn M. Yount and Abla M. Sibai

Introduction

Relative to other regions around the world, research on older adults in Arab countries has been sparse. This gap is surprising, given that adults aged 60 years and older in 2000–2005 represented about 6.5 per cent of Arab populations in Northern Africa and about 6.6 per cent in Western Asia (United Nations 2006). By 2050, these percentages should reach 19.4 and 17.8, respectively (United Nations 2006). Despite these trends, no longitudinal, comparative studies of older adults have been undertaken in the region. One of the first major efforts to characterize the health and socio-economic conditions of older adults in several Arab countries was the *World Health Organization Collaborative Study on the Social and Health Aspects of Aging*, which was a cross-sectional comparative study of adults aged 60 years and older that was conducted around 1990 in several sub-regions of Bahrain, Egypt, Jordan and Tunisia (Andrews 1998). A wide array of self-reported social, economic, demographic and health-related data were collected in this study but no objective measures of health were gathered and no follow-up was undertaken. Thus, estimates of the health status of the populations represented by these samples are based entirely on self- and/or proxy-reported data and their validity and reliability remain unknown.

Since this study, both Arab and Western scholars have undertaken several separate studies of older adults in Arab countries. Major efforts by demographers

include, but are not limited to, a two-wave study of the objective functional health and the subjective health and socio-economic conditions of adults aged 50 years and older in Ismailia, Egypt (Yount et al. 2003), a national, cross-sectional study of older adults in Kuwait (Shah et al. 2003) and a cross-sectional study of older adults in three communities in Beirut, Lebanon (Sibai and Chaaya 2006). Other social gerontological studies of older adults have taken place in Saudi Arabia, Somalia migrant communities in London, Arab American communities in the United States, the United Arab Emirates [UAE], Arabs in Israel and Jordanian aborigine communities (Jaddou et al. 2000; see also Litwin 2006 for a review of this literature) and several medical practitioners, epidemiologists and demographers have undertaken studies of specific diseases and/or health conditions among older adults in Egypt, Jordan, Lebanon, Saudi Arabia, Tunisia and the United Arab Emirates (Al-Shammari and Al-Subai 1999; Al-Shammari et al. 2000; Chaaya et al. 2006; Lamb 1997; Margolis and Reed 2001; Margolis et al. 2003; Yount and Agree 2005; Zeki Al Hazzouri 2006).

The objective of this chapter is to describe, to the extent that available data allow, 1) general trends in the demography of aging in Arab countries, 2) trends in the economic and social capital of older Arabs, including their access to schooling, schooling attainments, participation in the workforce and marital status, 3) trends in the living arrangements of older adults and their correlates and 4) an overview of the health status of older Arabs. Because the life course trajectories of Arab women and men in these four substantive areas often differ, we disaggregate estimates by gender whenever possible and explore reasons for observed differences. We also discuss where possible relevant structural conditions, such as changes in educational

K. M. Yount (✉)
Hubert Department of Global Health
and Department of Sociology
Emory University
Atlanta, GA, USA
E-mail: kyount@sph.emory.edu

infrastructures or systems of social insurance, which may have contributed to some observed trends in the characteristics of older adults.

To achieve these objectives, we draw on several sources of data. First, we make use of existing published studies, especially to describe the health and social statuses of older adults in the region. Second, we draw on publicly available census data and estimates of relevant population parameters from the United States Census Bureau and the United Nations Population Databases. Third, we present findings from all publicly available household-level datasets that were collected as part of the Demographic and Health Surveys [DHS] or equivalent national surveys in Arab countries (Egypt, Jordan, Morocco, Tunisia and Yemen), especially for the sections on schooling, work participation and marital status (Appendix 1). Although these datasets do not provide detailed information on older adults in Arab countries, they do provide important, basic demographic information on a nationally representative sample of older adults in the countries for which data are available. Countries defined as “Arab” in this chapter are those that house a majority of ethnically “Arab” populations and/or have Arabic specified as at least one of the official national languages. These countries include Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Lybia, Mauritania, Morocco, Oman, the Occupied Palestine Territories, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, the United Arab Emirates, Western Sahara and Yemen.

Trends in Arab Demography and Implications for Population Aging

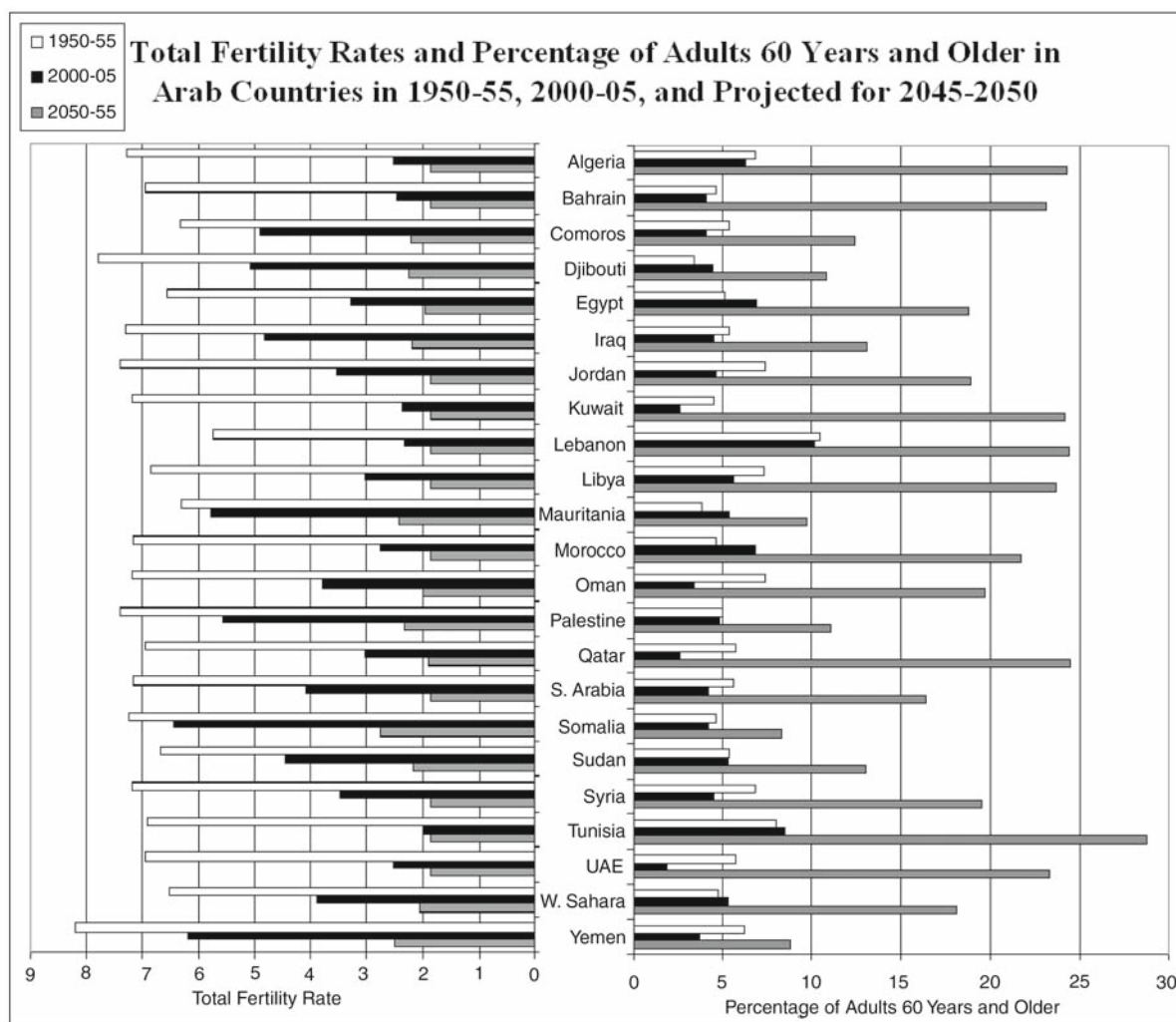
In the 1980s, demographers described the Arab Middle East as a region that was characterized by “poor” demographic performance. Caldwell (1986), for example, identified the region as one in which overall declines in mortality lagged behind expectations based on levels of economic development. Obermeyer (1992) counter-argued that, although regional trends in total fertility rates lagged behind economic improvements and declines in mortality, regional trends in mortality fit well with prevalent models of demographic change. Hill and Upchurch (1995) showed, however, that girls’ excess mortality was unexpectedly high, given overall

levels of under-five mortality, in countries representing the Middle Eastern Crescent (Egypt (1988, 1992), Jordan (1990), Morocco (1987, 1992), Northern Sudan (1989–1990) and Tunisia (1988)). Thus, demographers have disagreed about the “Arab record” of mortality decline but generally have identified these countries as ones in which fertility declines have lagged behind improvements in the economy and human survival.

Standard explanations for the Arab World’s “poor fertility performance” include the persistent demand for children as sources of family labor and social security, the low status of women in the region, early and universal marriage and religious and cultural mores opposing contraception (e.g., Caldwell 1986; Winckler 2005; see also the discussions in Obermeyer (1992) and Yount (2004)). Winckler (2005), however, has attributed direct or tacit pronatalism and relatively high rates of Arab fertility during the 1980s primarily to the “illusion” of pan-Arabism and to the 1970s oil boom, which obviated the needs to limit economic *étatisme* and to institute direct population policies. Winckler (2005) then attributed the subsequent adoption of direct family planning policies and programs during the late 1980s in many Arab states to interrelated declines in 1) the price of oil, 2) inter-Arab labor migration, 3) grants from the Arab oil states to the non-oil states and 4) work opportunities for the large pool of often well-educated youth.

Ten years have passed since this debate ensued and the demographic profiles of many Arab countries have changed considerably. Figure 13.1 shows changes in total fertility rates (TFRs) between 1950–1955 and 2000–2005 and projections in TFRs to the years 2045–2050 for Arab countries with available data. This figure also shows trends and projections in the percentage of the total population for each country that is aged 60 years and older. Trends and projections in life expectancy at birth during the same period are provided in Table 13.1.

In 1950–55 throughout the Arab world, TFRs were generally high and in all cases exceeded an average of 5 births per woman of reproductive age (Fig. 13.1). In fact, the TFR exceeded 7 in a majority of Arab countries (12 of 23) at this time (e.g., Algeria, Djibouti, Iraq, Jordan, Kuwait, Morocco, Palestinian Occupied Territory, Oman, Saudi Arabia, Somalia, Syria and Yemen). By the years 2000–05, however, Arab countries exhibited substantially more variation in their levels of total fertility. By this period, some countries



Source: UN Population Division (2005).

Fig. 13.1 Estimates of the total fertility rate and percentage of adults aged 60 years and older in Arab countries for 1950–1955, 2000–2005, and projected for 2045–2050

had already achieved replacement or near-replacement TFRs (e.g., Algeria (2.5), Bahrain (2.5), Kuwait (2.4), Lebanon (2.3), Tunisia (2.0), UAE (2.5)), whereas other countries still had TFRs greater than 5 (e.g., Djibouti (5.1), Mauritania (5.8), Somalia (6.4), Yemen (6.2)). By 2045–50, all countries in the Arab world are projected to achieve TFRs around the level of replacement.

Dramatic improvements in life expectancy at birth have also emerged in Arab countries over this period (Table 13.1). In 1950–55, 8 of the 23 countries with available data had life expectancies at birth below 40 years. In 12 of the 23 countries, life expectancies at birth ranged from 40 to 49 years and in only 3 countries

did life expectancies at birth reach 50–59 years. By 2000–05, a dramatic upward shift in life expectancies at birth was observable across all Arab countries, with only 4 populations having life expectancies less than 60 years, 6 having life expectancies between 60 and 69 years and a majority (13) having life expectancies between 70 and 79 years. Improvements in life expectancy at birth are expected to continue into 2045–50, by which time Arab populations are expected to have life expectancies at birth of 60–69 (3), 70–79 (13) and even 80 years or more (7).

These trends in total fertility and life expectancy at birth have notable effects on population age structures

Table 13.1 Number of Arab countries, by life expectancy at birth and year of estimate/projection

e_0 in years	1950–1955	2000–2005	2045–2050
< 40	8		
40–49	12		
50–59	3		
< 60		4	
60–69		6	3
70–79		13	13
≥ 80			7

Source: United Nations, Department of Social and Economic Affairs, Population Division. (2005).

Note: Countries in this summary include Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Palestinian Occupied Territory, Oman, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates (UAE), Western Sahara, Yemen.

in the Arab world and specifically on the percentage of adults that is aged 60 years and older. Figure 13.1 shows that, during 1950–1955, a majority (15) of Arab countries had between 5 and 10 per cent of their populations aged 60 years and older. During this period, several Arab countries (7) had fewer than 5 per cent of their populations aged 60 years and older and only one country (Lebanon) had more than 10 per cent of its population aged 60 years and older. In part because of sustained high levels of fertility during much of the second half of the twentieth century, the percentage of the population aged 60 years and older actually *declined* between 1950–1955 and 2000–2005 in most (16) Arab countries. This trend exemplifies well how declining infant and child mortality can lead to a younger population if high fertility is sustained. However, with more substantial fertility declines emerging in the latter part of the twentieth century, most (20 of 23) Arab populations are expected to have at least 10 per cent of the population aged 60 years and older by the period 2045–2050. In fact, a majority of Arab countries (15 of 23) are expected to have at least 15 per cent of their populations aged 60 years and older.

Finally, Fig. 13.2 shows estimates (from 1950–1955 to 2000–2005) and projections (to 2045–2050) of the total size of older-adult populations (60 years and older; 80 years and older) for countries with the smallest, median and largest populations of older adults in the Arab world. Egypt is the Arab country in which the largest number of older adults currently resides. Approximately 4.6 million adults aged 60 years and older are living in Egypt, and the population of Egypt-

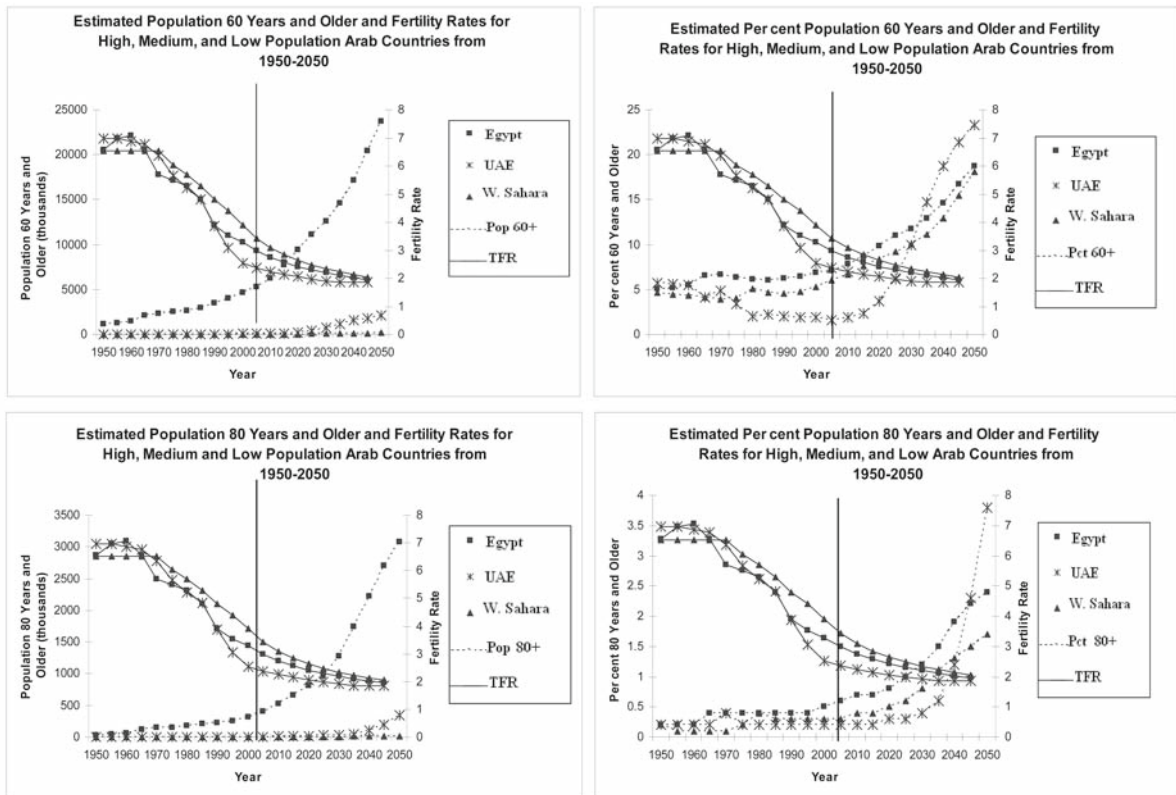
tians aged 80 years and older is nearing 320,000. These figures reflect Egypt's large population size more than its pace of fertility decline, however, which has lagged behind some of the smaller countries (e.g., the UAE) that have fewer *numbers* but higher *percentages* of older adults in their populations. Thus, some low-fertility Arab countries are already experiencing the effects of population aging and for many Arab countries, population aging is imminent.

The Economic and Social Capital of Older Arabs

With this overview of demographic trends, we next describe the social and economic characteristics of older adults in Arab societies. Using national data from the Demographic and Health Surveys, or comparable national surveys, the next three sub-sections describe the economic and social capital of older Arabs, focusing specifically on their achievements in schooling, participation in the labor force and marital status.

Schooling

In 1950, close to one half of the world's 540 million children aged 5–14 years were in some form of school (Benavot and Riddle 1988). According to the same authors, the percentage of the world's school-aged population that was enrolled in schooling increased modestly between 1870 and 1940 from 33 to 41 per cent and this increase was even more pronounced (from about one third to one half) among countries with more complete data for this period. Available data also suggest that mass schooling expanded rapidly during the latter part of the nineteenth century, slowed during the first two decades of the twentieth century and expanded more rapidly during the period between World War I and World War II (Benavot and Riddle 1988). Mean enrollment ratios increased in each major world region during this period but the pace of expansion varied considerably across regions. In Asia, the Middle East and Africa – where most countries were still under colonial occupation during the 1870–1940 period – the pace of primary school-



Source: UN Population Division (2005).

Notes. The data is presented in 5-year increments and is projected starting in 2005 using the medium variant prediction. Egypt, the United Arab Emirates, and Western Sahara, respectively, have the highest, medium and lowest population sizes of adults aged 60 years and older and 80 years and older in Arab countries.

Fig. 13.2 Population size, percentage of the population aged 60 or 80 years and older, and total fertility rates for Arab

countries with the largest, median, and smallest populations of adults aged 60 years and older (1950-2050)

ing expansion was consistently slow until World War I. During the 1920s and 1930s, rates of enrollment in primary school increased only moderately in the Middle East and Africa, although there are notable intra-regional differences in these trends. For example, with the exception of Lebanon, the French protectorates of North Africa and the Middle East (e.g., Algeria, Morocco, Syria and Tunisia) showed little evidence of primary educational expansion. In most areas under British occupation (e.g., Egypt and Palestine), primary enrollment rates were generally higher. In the remaining areas of the Middle East for which data were compiled (e.g., Iraq, Jordan and Kuwait), recorded primary enrollment rates were extremely low (Benavot and Riddle 1988). According to Benavot and Riddle (1988), others have attributed the low rates of primary enrollment among some countries in the Middle East and North Africa, as well as in this

region relative to other world regions, to the antipathy of Muslims toward Western forms of schooling and to localized attitudes and practices that limited educational opportunities for girls. Benavot and Riddle (1988) suggested, however, that the appearance of a relatively poor historical educational performance among some countries in North Africa/the Middle East may have resulted partly from the way in which figures on educational enrollment were recorded. Specifically, one of the problems with cross-national comparisons of historical enrollment rates is the inconsistency with which information on enrollment in “pre-modern,” religious, or non-Western schools was recorded. According to Craig (1981: 191–192), formal education was well established in most if not all societies in Asia and North Africa before contact with the West, and these forms of schooling often served the religious or ruling elite. When schooling

enrollment rates began to be recorded toward the end of the nineteenth century, these indigenous forms of schooling were being confronted with the influx of Western religious educational systems of missionaries, Western secular systems of colonizers and other primary schools that were funded by independent nation-states (Benavot and Riddle 1988). The effects of these new systems on existing Koranic or native schools was variable, as was the extent to which students in these other schools were counted in enrollment figures. In Egypt, according to Benavot and Riddle (1988: 197), 'enrollments in *kuttabs* (Koranic schools) were recorded until 1910 but, thereafter, the figures refer to elementary schools.' Thus, relatively low schooling enrollment rates in North Africa and the Middle East may have resulted from resistance by Muslims to the imposition of foreign schooling systems during colonization, as well as from skewed accounting systems that under-recorded enrollment in indigenous schooling systems.

At the policy level, the movement toward universal, compulsory education in some countries in North Africa/the Middle East nevertheless began before the end of foreign occupation and continued after independence. This period was the one when most of today's older adults in the region were eligible to begin school. In Egypt, for example, education became compulsory for children between the ages of 6 and 12 years beginning with Article 19 of the Egyptian constitution (1923) (Arab Republic of Egypt, Ministry of Education 2003). During the same year, another law was issued stipulating that compulsory education was to be free. Then, in 1944, 1951 and 1952, respectively, primary, secondary and all educational stages (including university) were declared to be free. Until this point, compulsory education was for six years. During this time a large quantitative growth in the educational system occurred, although it unevenly reached various subgroups in the population. These past patterns have implications for the schooling attainments of today's older women and men.

This past structural and political environment provides an important context for interpreting trends in "formal" schooling attendance and grade attainment levels among the current and emerging older adult population in Arab countries. Table 13.2 presents the percentage of listed household members in national surveys conducted in Egypt, Jordan, Leba-

non, Morocco, Tunisia and Yemen who ever had any (formal) schooling and the average number of grades of schooling completed, by age group, gender and year of the survey. Estimates are provided for the current (aged 50 years and older) and future (aged 20–49 years)¹ generations of older adults, by 10-year age intervals.

During the late 1980s and early 1990s, the percentage of the oldest-old (aged 80 years and older)² who had ever attended school and their estimated average grade attainment, were generally very low in all countries. For example, the percentage of men in this age group who had ever attended school ranged from 0 in Yemen to only 15 in Egypt and this range was even lower for the same age group of women (0–3 per cent). The percentages ever schooled among men 80 years and older increased markedly by the late 1990s and early 2000s in all but one country (Morocco) for which trend data are available, such that the share of oldest-old men who ever attended school now ranges from 4 per cent in Morocco to more than 30 per cent in Jordan. For the oldest-old women, the percentage ever schooled did not change much in absolute terms, such that between 1 and 13 per cent of women in this age group had ever been to school by the late 1990s and early 2000s. Grade attainment, however, remained low for both women and men in this age group, with highest average grades of school completed being only about two for men and less than one for women.

Table 13.2 also shows dramatic changes between the late 1980s and early 2000s in the percentage ever schooled and in the average number of grades attained among "younger" older adults (50–79 years) in these countries. Among men 50–59 years, the percentage ever schooled increased from a range of 4 per cent (in Yemen) to 54 per cent (in Egypt) during 1988–1992 to a range of 46 per cent (in Morocco) to 92 per cent (in Jordan) during 1998–2005. Increases also were marked among women aged 50–59 years (e.g., from a range of 0–32 per cent to a range of 18–58 per cent). However, increases in the percentage ever schooled were less dramatic among women than among men in Egypt and Morocco but were more dramatic among

¹ The age of 20 years is used as a cutoff for estimating ever schooling and grade completion because most individuals will have completed their schooling by this age in most of the countries under investigation here.

² The cohorts of older adults who were born around or before World War I in these countries.

Table 13.2 Percentage of adults with any schooling, and mean grades of schooling, by age, gender, country, and year of survey

	Age Group in Years																							
	20-29		30-39		40-49		50-59		60-69		70-79		≥80											
	M	W	M	W	M	W	M	W	M	W	M	W	M	W										
per cent with Any Schooling																								
Egypt ^a																								
1988	89.7	68.3	21.4	82.4	57.7	24.7	70.3	48.9	21.4	56.0	30.9	25.1	39.7	16.2	23.5	31.9	8.0	23.8	14.6	4.7	9.9	**		
1992	86.8	62.9	23.9	79.5	55.7	23.8	66.3	44.2	22.2	54.0	32.0	22.0	40.7	20.5	20.2	31.9	11.3	20.6	14.5	2.5	11.9	**		
1995	89.7	68.3	21.4	82.4	57.7	24.7	70.3	48.9	21.4	56.6	35.8	20.7	46.7	29.9	16.8	35.7	14.4	21.3	18.3	6.3	12.0	**		
2000	90.4	73.2	17.2	80.6	56.9	23.7	71.9	47.9	23.9	59.1	33.1	26.0	42.6	23.7	18.9	31.0	13.7	17.3	20.1	6.9	13.2	**		
2003	92.1	79.0	13.1	84.7	60.4	24.3	77.7	51.0	26.7	64.4	39.9	24.5	48.3	28.0	20.3	34.3	16.2	18.1	21.3	6.8	14.5	**		
2005	92.4	79.3	13.1	85.1	65.5	19.6	78.9	54.7	24.2	65.2	40.9	24.3	50.9	28.0	22.9	37.1	20.1	16.9	26.2	6.9	19.3			
Jordan																								
1990	96.5	93.0	3.5	92.8	76.8	16.0	85.6	45.0	40.6	65.2	16.7	48.4	47.8	13.3	34.5	27.3	6.7	20.7	4.8	1.6	3.2	*		
1997	96.8	97.4	-0.7	ns	94.6	92.3	2.3	*	92.9	75.8	17.1	85.8	41.0	44.8	67.5	21.2	46.3	53.0	9.5	43.6	20.5	2.5	18.0	
2002	98.9	98.0	0.8	*	97.5	95.0	2.6		96.8	85.5	11.3	92.2	58.2	34.0	72.8	25.1	47.8	60.1	19.7	40.5	30.7	5.9	24.8	
Lebanon																								
1996	88.1	87.8	0.3	**	84.7	81.3	3.4		80.3	68.1	12.2	64.5	46.0	18.5	29.4	44.1	14.7	35.5	21.8	13.7	22.6	12.7	9.9	
Morocco																								
1987 ^b	32.2			23.9			10.6			2.0			1.1					0.5			1.3			
1992	68.1	41.3	26.8	57.8	29.0	28.8	42.4	16.7	25.7	16.3	3.8	12.4	6.0	0.7	5.3	3.3	0.3	3.1	**	1.1	1.2	-0.1	ns	
2003	80.7	56.0	24.7	68.7	42.6	26.2	56.1	29.7	26.3	46.1	17.5	28.6	22.6	5.0	17.7	6.9	1.5	5.4	3.9	0.8	3.1		**	
Tunisia																								
1988 ^b	63.3			45.1			18.8			4.4			2.0					3.0			0.0			
Yemen																								
1991	56.7	14.5	42.1	27.5	4.6	23.0	10.4	0.8	9.7	4.0	0.2	3.8	1.3	0.3	1.0	**	0.8	0.0	0.8	*	0.0	0.0	0.0	ns
Mean Grades of Schooling																								
Egypt																								
1992	9.4	6.4	2.9	8.0	4.6	3.4	6.2	3.1	3.1	4.6	1.8	2.8	2.8	0.9	1.8	2.3	0.6	1.7	1.1	0.2	0.9	**		
2000	9.5	7.7	1.9	8.6	5.7	2.9	7.3	4.0	3.3	5.8	2.7	3.1	3.9	1.6	2.3	2.3	0.8	1.5	1.7	0.3	1.4	*		
2003	9.8	8.3	1.5	9.4	6.3	3.1	7.8	4.6	3.1	6.3	3.4	3.0	4.8	2.0	2.7	2.8	1.0	1.8	1.7	0.5	1.2	*		
2005	9.7	8.4	1.3	9.4	7.0	2.4	8.3	5.1	3.2	6.6	3.5	3.1	5.0	2.0	3.0	3.0	1.2	1.8	2.2	0.4	1.8			
Jordan																								
1997	10.7	10.8	-0.1	ns	10.2	9.2	1.0	9.7	6.5	3.1	8.3	2.9	5.3	4.8	1.3	3.6	3.3	0.5	2.8	1.3	0.1	1.2	**	
2002	11.3	11.5	-0.2	*	11.1	10.5	0.6	10.8	8.4	2.3	9.5	4.8	4.7	6.4	1.8	4.6	4.2	1.5	2.8	2.1	0.4	1.7	**	
Morocco																								
1992	5.4	3.2	2.2	4.3	2.1	2.2	3.2	1.0	2.2	1.2	0.2	1.0	0.4	0.0	0.3	0.2	0.0	0.2	*	0.1	0.1	0.0	ns	

Source: Estimates were computed by the authors from the Demographic and Health Survey for each country and year, or a comparable national survey in the case of Lebanon.

^a Estimates for Egypt 1988 are unweighted.

^b The question on schooling was asked only for women aged 15 years and older.

* $p \leq .05$; ** $p \leq .01$; ns not significant; all other gender differences are significant at the $p \leq .001$ level, adjusting for sample design.

women than among men in Jordan. Consequently, the gender gap in schooling among adults in their fifties increased in some countries and decreased in others. More generally, gender gaps in ever attending schooling increased over this period among all adults aged 60 years and older and gender gaps in the average number of grades attained increased among all adults aged 50 years and older in all countries. Thus, historical trends in ever schooling and grade attainment among older adults in all countries show that men tended to gain access to schooling earlier and to complete a higher average number of grades than women, despite substantial variation in schooling achievements across these selected countries. As a result, gender gaps in schooling favoring men have reached a peak in the current generation of older adults in this region.

Finally, Table 13.2 shows trends in the percentage ever schooled and the average number of grades attained among women and men aged 20–29, 30–39 and 40–49 years. These figures provide some idea of access to schooling and schooling attainments experienced by the future generation of older adults in these countries. (Note that most of those adults aged 35–49 years at the time of the earlier DHS surveys (1987–1993) would be “older adults” (e.g., aged 50 years and older) at the time of the later surveys (1998–2005).) Most notably, trends in gender gaps in schooling in these cohorts are shifting to decrease the disadvantage of women. In all cohorts except two (those aged 40–49 in Egypt and Morocco), gender gaps in the percentage ever schooled and in the average number of grades attained have declined since the late 1980s. Thus, women’s gains in schooling have more recently outpaced those of men (according to these two indicators) such that levels of ever schooling and average grade attainment are becoming more equal. At one extreme, gender gaps in schooling among 20–29 year-olds have disappeared in Jordan and Lebanon; whereas at the other extreme, these gender gaps still favor men substantially in Morocco (e.g., a gap of 25 in the percentage ever schooled and of 2.2 in the number of grades completed). Thus, in some countries in the region, large gender gaps in schooling will persist among older adults for several decades to come; whereas in other countries in the region (e.g., Jordan and Lebanon), gender gaps (according to these indicators of schooling) will largely have disappeared in the coming generations of older adults.

Work

Historically, researchers in Western countries have often assumed that older adults are no longer employed or economically active. This assumption in part justified using the age of 60 years (the age of retirement) as the defining characteristic of an “older adult.” As research on older adults has expanded to include those in poorer, non-Western countries, our understanding of the level of economic productivity of the world’s older adult population has changed dramatically.

Table 13.3 provides information about the social insurance systems that exist in Arab countries with available data (U.S. Social Security Administration 2006). Several points are noteworthy. First, laws pertaining to social insurance were initially established across a wide range of years, from as early as 1949 in Algeria to as late as 1991 in Oman. Second, separate systems of social insurance often exist for public servants, including but not limited to civil servants, the police and members of the armed forces. Besides public servants, the most commonly covered groups are those who are formal-sector workers and who have contributed to the social insurance system for a specified number of years. Third, although the qualifying age for old-age pensions is gender-neutral in some countries (e.g., Egypt, Kuwait, Sudan and Tunisia), it tends to differ for men and women – the most common qualifying age at retirement is 60 years for men and 55 years for women. Often, the qualifying age at retirement is reduced for those who have participated in “arduous” or “dangerous” work. Fourth and most importantly, the level of basic benefits for retirees in Arab countries varies widely. In some countries, the old-age benefit may be as high as 20–65 per cent of the insured person’s prior average monthly earnings (e.g., Kuwait, Mauritania, Morocco and Tunisia). In a majority of Arab countries, however, the basic benefit is between 2 and 2.5 per cent of the insured person’s average monthly earnings for some period before retirement times the number of years worked. Thus, in most Arab countries, older adults who have worked in the informal sector often do not qualify for an old-age pension and the actual benefit to those who have worked in the formal, private sector is generally quite low.

One expected result of pervasively small old-age pensions in Arab countries is that adults in these settings would continue to work into their later years. Table 13.4 provides estimates of the percentage of

Table 13.3 Description of old-age social insurance systems in Arab countries

Country	First law	Coverage	Basic Qualifying conditions	Basic benefits
Algeria	1949	Persons employed under a labor contract with earnings \geq 1/2 the legal minimum wage. Special systems for armed forces personnel and self-employed	Old age pension: 60 (men) or 55 (women and veterans) with \geq 15 y coverage, including \geq 7.5 y of contributions; regardless of age with 32 y of contributions. Retirement age reduced for those working in arduous conditions and for women who have raised \geq 1 child Retirement settlement: \geq 60 y with \geq 5 y or 20 quarters of coverage and ineligible for old-age pension Old age pension: Men: 60 with 15 y coverage or after 60 with 10 y coverage and 36 consecutive monthly contributions in last 5 y Women: 55 with 10 y coverage, after 55 with 10 y coverage and 36 consecutive monthly contributions in last 5 y Old-age settlement: Insured is ineligible for old-age pension	2.5 per cent of avg. monthly earnings in 5 y before retirement or best of 5 y of total career, times the # of y of coverage, up to a maximum of 80 per cent Min = 75 per cent of legal monthly min wage; Max = 15X legal monthly min wage. 1000 dinar dependent spouse supplement (USD=73 dinar) 2.5 per cent of avg monthly earnings in the 5 y before retirement (or best 5 y)
Bahrain	1976	Bahraini employed persons with establishments with 5 or more employees. Public sector employees	Old-age pension: 60 with 120 months of contributions Old-age settlement: 60 but does not qualify for a pension.	2 per cent of insured's monthly avg earnings in last 2 y times the # of y of contributions. Min. pension is insured's avg contributory wage during last 2 y or 150 dinar/mo. (USD=0.37Dinar) Must be at least 30 dinars/mo for ever family member. Max. pension 88 per cent of avg earnings 15 per cent of insured's avg monthly earnings in last 2 y, multiplied by 12 times the # of y of contribution Base: 1/45 of the avg monthly earnings for each year of contributions, up to a max of 36 y Minimum total (base + variable) pension = 50 per cent of avg monthly earnings in last 2 y (with \geq 20 y coverage) or 100 pounds/mo. (USD=6.2pounds) Max total pension = 80 per cent of avg monthly earnings or 900 pounds/mo. Up to 15 per cent of total base + variable earnings multiplied by 12, for each year of contribution.
Egypt	1950	Employed persons \geq 18 y or \geq 16 if a government employee. Special systems for self-employed	Old-age pension: 60 (men) or 55 (women) with 180 months of coverage, including 60 mo of paid contributions Old-age settlement: Does not qualify for a pension	2.5 per cent of insured's average monthly wage in last 2 y times the # of y of contributions. Max: 75 per cent of avg monthly wage in last 2 years. Dep. Supplement: raised 10 per cent for 1 and 5 per cent for 2,3 Lump sum, with is a per cent of insured's avg annual wage, based on # of y of contribution. (10 per cent for 12-60 mo; 12 per cent for 60-179 mo; 15 per cent for 180 mo or more).
Jordan	1978	Employees $>$ 16 y in private establishments with \geq 5 workers. Govt/public sector employees not otherwise covered. Special schemes for public-sector under civil laws	Old-age pension: 60 (men) or 55 (women) with 180 months of coverage, including 60 mo of paid contributions Old-age settlement: Does not qualify for a pension	2.5 per cent of insured's average monthly wage in last 2 y times the # of y of contributions. Max: 75 per cent of avg monthly wage in last 2 years. Dep. Supplement: raised 10 per cent for 1 and 5 per cent for 2,3 Lump sum, with is a per cent of insured's avg annual wage, based on # of y of contribution. (10 per cent for 12-60 mo; 12 per cent for 60-179 mo; 15 per cent for 180 mo or more).

Table 13.3 (continued)

Country	First law	Coverage	Basic Qualifying conditions	Basic benefits
Kuwait	1976	All employees for self-employed and military personnel	Old-age pension: 50 with 15 y of contributions for men and women. Age=40 with 15 years of contribution for married women and women with children	65 per cent of insured's last monthly earnings plus 2 per cent for each y of contribution beyond 15 y. Max. benefit is 95 per cent of insured's last monthly earnings. Part of benefit may be paid as lump sum at pensioner's request before age 65 y.
Lebanon	1963	Employees in industry, commerce, agric. Special system for public-sector employees and teachers	Old-age pension: Payable from 60, compulsory at 64; at any age after 20 y employment; if a woman marries and leaves work during 1st y of marriage; if disabled (with ≥ 20 y work); on death (with ≥ 6 y)	Lump sum equal to final month's earnings (or avg of previous 12 mo) times the # of years of service up to 20 y, plus 1.5 mo earnings/y of service beyond 20 y or age 64. Lump sum = 50 per cent of benefit for 1-5 y service, 65 per cent for 6-10 y, 75 per cent for 10-15 y, 85 per cent for 15-20 y
Libya	1957	All residents. Special system for armed forced personnel	Old-age pension: 65 (men) or 60 (women); 62 for civil servants, 60 for workers in hazardous or unhealthy occupations	2.5 per cent of insured's avg earnings during last 3 y for each of 20 y of contribution, plus 2 per cent of insured's avg earning for each year beyond 20 y. Minimum: 96 dinars/mo (80 per cent of national minimum wage); Max: 80 per cent of insured's average earnings. 4 dinar/mo for wife, and 2 dinars/mo per child < 18 y. (1USD=1.28 Dinar) www.currencysource.com
Mauritania	1965	Wage earners. Special systems for civil servants and armed forces personnel.	Old-age pension: 60 (men) 55 (women) with 20 y insurance coverage, including 60 mo of contributions in last 10 y. Old-age settlement: Insured is ineligible for old-age pension	20 per cent of avg monthly earnings in last 3-5 y, plus 1.33 per cent for each 12-mo period of insurance coverage > 180 mo. Min = 60 per cent of highest min wage; Max = 80 per cent of avg monthly earnings. Lump sum equal to one month's wages for each year of insurance coverage
Morocco	1959	Salaried workers and apprentices. Excludes self-employed Special systems for civil servants and certain other categories of employees.	Old-age pension: 60 (55 for miners with 5+ y of underground work) and 3240 days of insurance coverage. Retirement.	50 per cent of avg monthly earnings during last 96 mo, plus 1 per cent for every 216 days of insurance beyond 3240 day, up to a max of 70 per cent. Min: 50 per cent of avg mo earnings; Max: 70 per cent of avg monthly earnings.
Oman	1991	Citizens 15-59 y employed in private sector under a permanent work contract.	Old-age pension: 60 with at least 180 mo of paid contributions (men) or 55 with at least 120 months of paid contributions (women)	1/40th of insured's avg wage during last 2 y of work times # of full y of contributions.
S. Arabia	1962	Employees of all firms and self-employed. Special system for public-sector employees	Old-age pension: 60 (men) 55 (women) with 120 mo of contributions. 55 (men) with 120 mo of contributions and in arduous/unhealthy work. Old-age settlement: Insured is ineligible for old-age pension	2.5 per cent of insured's avg monthly wage during last 2 y times the # of y of contributions. Min is 1500 riyals (1USD=3.75 riyals) Lump sum equal to 10 per cent of insured's avg monthly wage for first 60 mo of contributions and 12 per cent for any additional mo, if insured is 60 y.

Table 13.3 (continued)

Country	First law	Coverage	Basic Qualifying conditions	Basic benefits
Sudan	1974	Employed and self-employed. Special systems for civil servants, police, armed forces personnel.	Old-age pension: 60 with 20 y contributions. Retirement age reduced for those in arduous work. Retirement. Old-age settlement: Insured is ineligible for old-age pension, or resigns or is laid off. Old-age pensions: 60 (men) 55 (women); any age for men/women in physically demanding or dangerous jobs, with 180 mo of contributions. Old-age settlement: 60 (men) 55 (women), ineligible for old-age pension	1/50 of insured's avg monthly earnings in 3 y before retirement for each 12-mo period of contribution. Min = 40 per cent, Max = 80 per cent of insured's avg monthly earnings in 3 y before retirement. 100 per cent of employer and employee contributions. 2.5 per cent of insured's avg monthly earnings in prior y X yrs of contribution, up to 75 per cent of base earnings. Min = legal minimum wage; Max = 3450 pounds/mo or 75 per cent of base earnings. Lump sum of 11-15 per cent of total covered earnings.
Tunisia	1960	Private-sector employees, certain fisherman. Special systems for civil servants, members of parliament, armed forces personnel, certain other workers.	Old-age pension: 60 with 120 mo of contributions. Retirement. 50 with \geq 180 mo of contributions if insured prematurely aged from arduous work, involuntary unemployment for 6 mo, or mother of 3 children. Public sector old-age pension: 60 with \geq 15 y of contributions (men); 55 with \geq 10 y of contributions (women) Private sector old-age pension: 60 (men) 55 (women) with \geq 15 y contributions.	40 per cent of average earnings in last 10 y before retirement, plus 0.5 per cent for every 3-mo period of contributions beyond 120 mo, up to max of 80 per cent of avg earnings. Min = 2/3 legal monthly minimum wage; Max = 80 per cent of avg earnings, up to 6 times the legal monthly min wage. Public sector: final mo's gross salary times # of mo of contributions, divided by 420 Min = 7000 rials/mo (1USD=179 rials); Max = 100 per cent based on 35 y of contributions Private-sector: final mo's salary X the # of months of contributions, divided by 420. Min = 50 per cent of final month's gross salary
Yemen	1980	Private-sector employees, Yemeni workers abroad. Permanent employees of govt agencies. Public sector- quasi-public entities special systems for military/police	Public sector old-age pension: 60 with \geq 15 y of contributions (men); 55 with \geq 10 y of contributions (women) Private sector old-age pension: 60 (men) 55 (women) with \geq 15 y contributions.	40 per cent of average earnings in last 10 y before retirement, plus 0.5 per cent for every 3-mo period of contributions beyond 120 mo, up to max of 80 per cent of avg earnings. Min = 2/3 legal monthly minimum wage; Max = 80 per cent of avg earnings, up to 6 times the legal monthly min wage. Public sector: final mo's gross salary times # of mo of contributions, divided by 420 Min = 7000 rials/mo (1USD=179 rials); Max = 100 per cent based on 35 y of contributions Private-sector: final mo's salary X the # of months of contributions, divided by 420. Min = 50 per cent of final month's gross salary

Source: U.S. Social Security Administration (2006).

Table 13.4 Percentage of older adults by working status at the time of the survey, by age, gender, country, and year of survey

	Age Group in Years														
	≥ 50			50–59			60–69			70–79			≥ 80		
	M	W	W-M	M	W	W-M	M	W	W-M	M	W	W-M	M	W	W-M
Working, with or without compensation															
Egypt ^a															
1988	64.2	4.8	-59.5	86.3	7.2	-79.1	51.1	2.7	-48.5	27.4	1.7	-25.7	21.1	1.4	-19.8
1992	65.5	6.2	-59.4	88.6	8.9	-79.8	51.3	3.7	-47.5	31.7	3.7	-28.0	24.0	1.6	-22.4
1995	68.1	6.6	-61.5	89.0	10.4	-78.6	55.3	3.3	-52.1	39.2	3.4	-35.9	23.0	1.0	-22.0
2000	62.2	6.3	-55.9	87.5	10.7	-76.8	43.9	2.6	-41.2	23.6	1.2	-22.4	12.2	0.2	-12.0
Jordan ^b															
1990	58.0	1.6	-56.4	75.4	2.4	-73.1	47.9	1.4	-46.5	28.7	0.0	-28.7	11.4	0.0	-11.4
Lebanon ^c															
1996	63.5	7.6	-55.9	85.2	11.9	-73.4	60.2	6.2	-54.1	33.2	2.2	-31.0	13.6	0.7	-12.8
Yemen ^a															
1991	63.1	7.2	-55.9	80.3	9.9	-70.4	65.7	6.6	-59.1	47.0	3.5	-43.5	20.9	2.0	-19.0

Source: Estimates were computed by the authors from the Demographic and Health Survey for each country and year, or from a comparable national survey in the case of Lebanon.

Note: All gender differences are significant at the $p \leq .001$ level, adjusted for the sample design.

^a Work in the prior month

^b Economic activity in the prior week

^c Current work inside (often work on family farm, small family enterprise) or outside the home.

older adults in selected Arab countries who were working at the time of each survey. Figures are disaggregated by age group, gender, country and year of the survey. Estimates are presented for those countries in which a Demographic and Health Survey (or equivalent national survey in the case of Lebanon) included a question about each household member's work status. In most cases, the question referred to work in the prior month; in Jordan, the question referred to economic activity in the prior week; in Lebanon, the question referred to current work inside or outside the home.

Some patterns and trends are noteworthy. First, a majority of men aged 50 years and older were working at the time of each survey (ranging from 58 per cent in Lebanon in 1996 to 68 per cent in Egypt in 1995). By contrast, only a small minority of women aged 50 years and older were working in each country and survey year (ranging from 2 per cent in Jordan in 1990 to 8 per cent in Lebanon in 1996). Egypt is the only country with estimates of work status for multiple survey years and there is no evidence of a change in the percentage of Egyptian adults aged 50 years and older who were working over this time period. However, the percentage of older adults who were working does appear to decline slightly over time for those aged 60 years and older (e.g., from 51 to 44 per

cent among men aged 60 to 69 years). In all years and all countries, not surprisingly, the percentages of older men and women who were working at the time of each survey are highest among those aged 50–59 years and these percentages decline with increasing age for men and women. Still, a substantial share of men aged 80 years and older continued to work in all countries and survey years (Egypt: 21 per cent in 1988 and 12 per cent in 2000; Jordan: 11 per cent in 1990; Lebanon: 14 per cent in 1996; Yemen: 21 per cent in 1991).

Thus, a large percentage of older Arab men continue to work after the official age of "retirement" for men in most Arab countries. The vast majority of Arab women in all countries represented here do not work (at least in the formal sector) in their later years. Information on informal-sector work however, is limited and a substantial percentage of older women may remain economically active in this sector (Hoodfar 1997).

Marriage

Marriage is perhaps the most important social event in the lives of most Arabs (e.g., Hoodfar 1997). In customary marriages, the man is expected to provide

financially for his wife and family and the woman is expected to obey her husband in exchange for her husband's financial support. Although the laws regarding marriage differ widely across Arab countries (An-Nai'm 2002; Charrad 2001), a majority of Arab women do not work after marriage and child-bearing (Economic and Social Commission for West Asia [ESCWA] 2002) and so rely on their husbands for financial and material support. In many Arab societies historically and today, endogamous marriages (e.g., marriages between blood relatives and often cousins) have comprised a large minority of marriages (e.g., Bittles 1994), even though the rationales for such marriages vary across contexts (e.g., Hoodfar 1997). Some scholars have argued that endogamous marriages provide additional social and financial security for women (e.g., Hoodfar 1997; Rugh 1984), whereas others have shown that proximity to natal kin rather than cousin marriage may be more relevant for various dimensions of women's well-being in these settings (Yount 1999, 2004, 2005a). Compared to the U.S., divorce is relatively rare in many Arab societies (Obermeyer 1992) and so widowhood is the primary means by which Arab marriages end. That said, men tend to remarry after divorce or widowhood more often than do women and so the social and economic implications of widowhood may be greater

for women than for men. Thus, marriage is a central social and financial institution for couples and families but is an especially important institution for Arab women, who derive much of their social status from marriage, often lack alternative means of financial support and remarry less often than do men.

In this context, Table 13.5 shows the percentage of older adults who are widowed, by age, gender, country and survey year. The pattern across all countries, ages and years indicates a far higher percentage of widowhood among older women than older men. Among adults aged 50 years and older, this gap ranges from 26 per cent in Yemen in 1991 to 45 per cent in Egypt in 1995. Not surprisingly, this gender gap in widowhood is larger among older than among younger older adults across all countries and years. This gender gap in widowhood appears to have declined over time among older Egyptians, primarily because the percentage of widowed women has declined at all ages. Still, a substantially higher percentage of Egyptian women than men of all ages was widowed in 2005 (gaps of 24 per cent at ages 50–59, 46 per cent at ages 60–69, 60 per cent at ages 70–79 and 57 per cent at ages 80 years and older). The gender gap in widowhood remained fairly stable over time in Jordan (about 30 per cent at ages 50 years and older). In all countries across all years, the percentage of men aged less than 70 years who were widowed never exceeded 10, suggesting that only a

Table 13.5 Percentage of adults aged 50 years and older who are widowed, by age, gender, country, and year of survey

Country	Year	Age Group in Years														
		≥ 50			50–59			60–69			70–79			≥ 80		
		M	W	W-M	M	W	W-M	M	W	W-M	M	W	W-M	M	W	W-M
Egypt	1988	6.9	50.9	44.0	3.0	32.9	29.9	7.1	62.3	55.2	17.6	80.1	62.5	22.0	90.5	68.6
	1992	7.1	47.5	40.4	1.8	30.8	29.0	7.0	55.9	49.0	19.3	74.8	55.5	30.4	91.3	61.0
	1995	7.4	52.3	44.9	2.6	34.2	31.6	6.6	61.0	54.4	18.3	83.3	65.0	34.0	89.4	55.4
	2000	7.1	47.6	40.6	2.7	29.4	26.7	8.2	55.6	47.4	14.7	81.2	66.5	31.2	88.5	57.3
	2003	8.2	45.5	37.3	3.0	27.0	24.0	7.6	54.4	46.8	21.3	82.1	60.8	34.7	90.7	56.0
Jordan	1990	3.2	33.5	30.4	0.0	16.9	16.9	2.3	37.9	35.6	6.0	69.3	63.4	23.6	81.1	57.5
	1997	4.1	34.8	30.7	0.5	17.0	16.6	3.4	41.6	38.2	11.9	61.8	49.9	24.6	87.5	62.9
	2002	3.3	34.7	31.4	0.9	18.8	17.9	2.9	40.2	37.3	7.3	57.4	50.1	17.5	79.1	61.6
Lebanon	1996	5.5	32.8	27.3	1.3	16.6	15.3	4.1	33.3	29.3	10.6	55.6	45.0	28.9	77.1	48.1
Morocco	2003	5.4	42.3	36.9	2.7	25.7	23.1	4.0	43.6	39.7	9.5	67.0	57.5	18.4	84.4	65.9
Tunisia	1988	5.6	37.3	31.7	1.1	18.2	17.1	4.6	43.5	38.9	10.7	69.4	58.7	27.8	90.4	62.6
Yemen	1991	6.4	32.4	26.0	2.7	17.8	15.1	5.4	35.0	29.7	10.6	51.4	40.8	15.8	67.2	51.4

Source: Estimates were computed by the authors from the Demographic and Health Survey for each country and year, or from a comparable national survey in the case of Lebanon.

Note: All gender differences are significant at the $p \leq .001$ level, adjusted for sample design.

small minority of older Arab men experience widowhood before age 70 years.

There are three main explanations for this widespread gender gap in widowhood in the Arab countries under study. First, Arab women tend to live longer, on average, than do Arab men and so husbands have higher risks of dying than their wives at any given age. Second, Arab women tend to marry at younger ages than do Arab men and the mean age difference between spouses (husband–wife) can be quite large (Westoff 2003). As a result, older husbands have a higher risk of dying than their younger wives. Third, Arab women generally tend to remarry less often than do Arab men and so women are more likely to remain unmarried after widowhood. For all of these reasons, Arab women are substantially more likely than Arab men to be with a spouse in their later years.

Taken together, selected measures of economic and social capital, namely access to schooling, schooling attainment, workforce participation and marital status, expose certain vulnerabilities of older adults in Arab societies. Among the oldest-old, ever attending school and the level of schooling attainment are very low for women and men. Trends in access to schooling suggest that older men benefited first from the expansion of schools and as a result, gender gaps in ever schooling and the level of schooling attainment have peaked among the current generation of older Arabs. That said, women's rate of access to schooling and their schooling achievements more recently have outpaced those of men in some Arab countries, such that gender gaps in schooling among older adults will have disappeared in some countries (e.g., Jordan and Lebanon) even though they will persist in others (e.g., Morocco, Yemen and Egypt). Because of poor social insurance systems in a majority of Arab countries, a majority of older adults continue to work after the official age of retirement. This burden is carried largely by older men, because older women rarely report working in the formal sector. Of course a large percentage of older women may be contributing productively to households through informal-sector work but comparative data to evaluate this hypothesis are limited. Finally, widowhood is experienced markedly more often by older women than by older men and only a small minority of older Arab men experience widowhood before the age of 70 years. The loss of a spouse is especially salient for

older women, who depend heavily on marriage for financial support. Thus, compared to their male counterparts, older Arab women have received less formal schooling, participate less often in the documented labor force and more often have experienced widowhood. With these social and economic vulnerabilities as background, we turn to a discussion of the living arrangements of older Arabs.

The Living Arrangements of Older Arabs

Principles of Kinship and Their Implications for Co-residence in Arab Countries

The family, not surprisingly, continues to be the main source of support for most Arabs. Because systems of public support are nascent in many Arab societies, co-residence is one means by which Arab families meet the needs of younger and older adults (e.g., Khadr 1997; Shah et al. 2002; Yount 2005b; Yount and Khadr 2008). Despite the prominence of family as its members' main source of support, studies of intergenerational co-residence and other exchanges of support are relatively rare (Aykan and Wolf 2000; Aytac 1998; Khadr 1997; Shah et al. 2002; Sibai et al. 2007; Yount 2005b, 2008; Yount and Khadr 2008).

In a systematic review of anthropological studies from the 1920s to the 1970s, Charrad (2001) offered three organizing principles of kinship in Arab Middle Eastern societies. This schema is useful for understanding propensities for intergenerational co-residence among older Arabs. First, familial solidarity is based on bonds connecting male members of the same paternal lineage (see also Stevenson 1997). This principle means that married men are usually the designated heads of family and that sons assume more responsibility in family decisions as they enter adulthood and at the death of their fathers. Imbedded in this principle among Muslims are religious rules of inheritance that favor men over women and collateral male kin over wives and daughters. Such rules affirm patrilineal bloodlines and men's obligations to support the family financially (Charrad 2001; Rugh 1984). Inheritable assets include the parental home, which some women

in Egypt acknowledge will transfer to their eldest son at the death of their husband (Yount 1999). Such transfers impose obligations of support, which may come in the form of co-residence.

A second principle of kinship in Arab societies is what some scholars call the “patriarchal bargain” (Kandiyoti 1988), whereby women adhere to codes of behavior that uphold the collective interests of the kin group in exchange for protection from biological kin and especially from brothers and sons (e.g., Charrad 2001; Kabeer 1999; Stevenson 1997). These codes of behavior include modesty, obedience and the performance of domestic kin-keeping tasks for senior relatives and dependents. Securing the protection of male kin can be important for many Arab women, who often have fewer rights in marriage than do men (An-Na'im 2002; Yount 1999, 2005b). Promises of protection from kin in a context of weaker marital rights motivate many women to nurture ties with natal kin and children as means of old-age support (Rugh 1984).

A third principle of kinship in Arab societies is a preference for patrilocal residence and kin endogamy (see also Stevenson 1997). In 1995 in Egypt, for example, approximately 39 per cent of ever-married women aged 15–49 years were married to a blood relative (El-Zanaty et al. 1996). Endogamous marriage maintains strong ties between daughters and their natal families because spouses in such marriages “...carry the same patrilineal blood lines... [and] jointly owe their obligations to the same male members of the extended family...” (Rugh 1984: 145; see also Aykan and Wolf 2000). Despite this tendency, Egyptian families still expect the main duties of a daughter to shift to her husband and his family (e.g., Mernissi 1987; Morsy 1993; Rugh 1984; Yount 1999) and so the main, customary form of assistance from married daughters is not co-residence. Residence with daughters would therefore be expected to decline with parental age as each daughter marries and establishes an independent household with her husband and possibly her in-laws. Still, the principle of patrilocal endogamy enables a large share of daughters to visit their parents frequently and to provide assistance with activities of daily living (Andrews 1998; Khadr 1997; Yount 1999). These marital customs also provide sufficient flexibility within the kinship system to enable older adults to use alternative co-residential arrangements when needed (Yount 2005b), as is the case in other settings (e.g., Ofstedal et al. 1999). Older parents, for example, may

live with married daughters in the absence of surviving sons or in cases of conflict with a son's spouse.

These principles of kinship offer clues about the normative lifecycle of intergenerational co-residence in many Arab societies (and elsewhere) (Hancioglu 1985; Morgan and Hiroshima 1983). First, children should live with their parents until they have secured the resources for marriage (Singerman and Ibrahim 2001).³ At the *dukhla* (the night when joint residence begins), a new couple may live initially with the husband's parents for economic reasons. In 1995 in Egypt, for example, 55 per cent of ever-married women aged 15–49 years lived with the husband's family at the start of the marriage (El-Zanaty et al. 1996). Ideally, couples would later establish an independent household, often after the birth of children (Khadr 1997; Nawar et al. 1995) and adherence to the ideal of independent living in the early part of marriage would be reflected in declines in the frequency of residence with sons and daughters as parents age. Later in the family lifecycle, parents may resume residence with a married son, especially when the parents require more financial assistance, when one of the two parents passes away, or when the health of one or both parents declines and they require assistance with activities of daily living (often from a married son's wife).

Variation and changes over time in intergenerational coresidence suggest increasing heterogeneity in norms about living arrangements and the expression of intergenerational support in Arab societies. In Kuwait, for example, 89 per cent of older women and 94 per cent of older men live with children (Shah et al. 2002); however, the percentage of households in which a married couple is living only with their *unmarried* children *increased* from 50 per cent in 1994 to 70 per cent in 1999 (Shah, Shah, and Radovanovic 1998; Shah et al. 2000). As mentioned above, in Egypt 55 per cent of ever-married women aged 15–49 years in 1995 lived with the husband's family at the start of the marriage (El-Zanaty et al. 1996), whereas trends toward early nuclear living are more common in places like Tunisia (Holmes-Eber 1997). Despite trends toward nuclear living in the earlier part of the family life cycle, older and younger generations may continue to live in close

³ In 2000 in Egypt, the median age at marriage was 19.5 years among ever-married women aged 25–49 years (El-Zanaty and Way 2001) and men have tended to marry considerably later than women, on average (Singerman and Ibrahim 2001).

proximity and to visit each other often (Al-Thakeb 1985; Altorki 1986; Andrews 1998; Barakat 1988; Holmes-Eber 1997; Khadr 1997; Shah et al. 2002). Such arrangements may facilitate intense exchanges of support and enable elders to retain some senior authority in the family.

Patterns and Trends in Living Arrangements

Given this review of normative and observed living arrangements among older adults, we explore patterns and trends in the actual living arrangements of older adults in the countries for which national data are available from the DHS (Egypt, Jordan, Morocco, Tunisia, Yemen) or comparable surveys (Lebanon). The percentage of older adults who are living alone is among the most widely available measures of older adults' living arrangements, in part because of the way in which data on households have been collected (United Nations 2005). Older Arabs living alone are a relevant socio-political group because they defy the Arab normative lifecycle of intergenerational co-residence, may more often need external assistance when ill or disabled, face greater risks of social isolation and may more often be poor (Casey and Yamada 2002).

Table 13.6 shows the percentage of adults aged 50 years and older who are living alone, as well as the gap in the percentage of women and men who are living alone (Women–Men), by age group, gender, country and survey year. In Egypt, Jordan, Lebanon, Morocco, Tunisia and Yemen, between 0.4 and 3 per cent of older men were living alone between 1988 and 2005, compared to between 2 and 9 per cent of older women. In any given year across all countries, a significantly higher percentage of older women than older men were living alone, with the gender gap ranging from 2 to 6 per cent. Since the late 1980s, the gender gap in the percentage living alone has become more pronounced in Egypt than in the other countries, partly because this gender gap has increased among Egyptians in their seventies. At this age, 7 per cent more Egyptian women than men were living alone in 1988, compared to 16 per cent more women than men in 2005. Although there is also some tendency for the gender gap in living alone to increase over time among the oldest-old (≥ 80 years) in Jordan and Morocco, this gap has tended to decrease over time among those aged 60–79 years in the same countries.

Table 13.7 provides more detailed information about the average household structure among adults aged 50 years and older in the same six countries, for two time points where available. The specific estimates shown

Table 13.6 Patterns in the prevalence of living alone, by age, gender, and year of the survey, selected Arab countries (1988–2005)

Country	Year	Age Group in Years																		
		≥ 50			50–59			60–69			70–79			≥ 80						
		M	W	W-M <i>p</i>	M	W	W-M <i>p</i>	M	W	W-M <i>p</i>	M	W	W-M <i>p</i>	M	W	W-M <i>p</i>				
Egypt	1988	1.4	6.9	5.5	0.5	3.6	3.1	1.4	9.3	7.9	4.2	11.4	7.2	3.3	12.8	9.5	**			
	1992	1.8	7.0	5.3	0.5	3.1	2.6	1.7	9.2	7.5	5.0	15.8	10.8	7.0	10.4	3.4	ns			
	1995	2.3	8.6	6.3	0.9	4.1	3.2	2.2	11.0	8.8	6.0	17.2	11.2	6.8	11.9	5.1	ns			
	2000	2.3	7.7	5.4	1.0	3.4	2.4	2.8	9.4	6.6	4.7	17.8	13.1	8.7	13.2	4.5	ns			
	2003	3.0	8.5	5.5	1.9	4.3	2.4	2.7	11.3	8.6	5.4	16.1	10.7	12.1	16.2	4.1	ns			
	2005	2.3	8.2	6.0	1.0	3.2	2.2	3.1	11.3	8.2	3.8	19.6	15.8	7.5	13.5	6.0	*			
Jordan	1990	0.5	2.0	1.5	0.2	0.5	0.3	ns	0.2	2.4	2.2	**	1.0	5.6	4.6	**	3.7	6.3	2.6	ns
	1997	1.3	5.3	3.9	0.8	1.6	0.8	ns	1.1	5.6	4.5	2.1	13.7	11.6	6.0	15.5	9.5	*		
	2002	0.4	2.0	1.6	0.2	0.8	0.6	†	0.4	1.9	1.5	†	1.3	4.2	2.9	*	0.5	7.7	7.2	
Lebanon	1996	3.3	8.4	5.2	2.1	3.3	1.2	3.0	8.4	5.4	4.8	16.6	11.8	9.1	20.3	11.2				
Morocco	1992	1.4	3.8	2.4	1.1	1.7	0.6	ns	1.2	4.6	3.4	1.9	8.8	6.9	2.3	5.5	3.2	ns		
	2003	1.1	2.7	1.6	1.1	1.4	0.3	ns	0.8	2.9	2.1	2.0	5.0	3.0	*	0.3	4.8	4.5		
Tunisia	1988	1.0	4.3	3.2	0.8	1.1	0.3	ns	0.9	5.4	4.5	1.7	11.1	9.4	2.1	8.8	6.7	*		
Yemen	1991	1.8	4.0	2.1	1.0	1.3	0.3	ns	2.1	5.6	3.5	2.1	6.6	4.5	3.3	7.8	4.5	*		

Source: Estimates were computed by the authors from the Demographic and Health Survey for each country and year, or from a comparable national survey in the case of Lebanon.

† $p \leq .10$; * $p \leq .05$; ** $p \leq .01$; ns not significant; all other gender differences are significant at the $p \leq .001$ level, adjusting for sample design

Table 13.7 Household structure among adults aged 50 years and older in selected Arab countries, by gender and year of the survey

Relation to Household	Egypt			Jordan			Lebanon			Morocco			Tunisia ^a			Yemen		
	1992			1997			1996			1992			1988			1991		
	M	W	p	M	W	p	M	W	p	M	W	p	M	W	p	M	W	p
Head	93.4	22.2		94.2	19.7		94.2	23.6		91.5	22.2		90.5	20.9		91.3	11.2	
Spouse	0.1	44.9		0.2	54.4		0.2	54.8		0.6	46.1		1.5	48.1		0.2	53.6	
Parent	3.7	26.3		3.9	18.0		3.3	13.9		4.7	21.8		4.1	21.1		5.1	22.5	
Parent-in-law	0.4	2.0		0.1	2.1		0.3	1.4	ns	0.2	2.3		0.3	2.1		0.4	1.8	
Brother/Sister	1.2	1.1	ns	0.5	2.0		0.9	3.2	†	1.1	1.8	†	1.1	1.5	ns	0.8	1.5	**
Other relative	1.1	3.3		0.7	2.7		1.1	2.8	ns	1.7	4.8		2.3	5.1		2.1	9.0	
Non-relative	0.0	0.2	*	0.4	1.1	*	0.1	0.3	ns	0.3	1.1		0.2	1.2		0.1	0.2	†
Mean # of household members	6.7	6.2		7.3	6.5		4.8	4.3	**	9.9	9.4	**	9.1	8.7	†	6.5	6.0	
Mean # of child (<15 y) household members	2.0	1.9		1.9	1.5	**	0.7	0.6	*	3.2	2.9		2.5	2.3	*	1.8	1.5	
Mean # of adult (≥ 15 y) household members	4.7	4.3		5.5	5.1	**	4.1	3.7		6.7	6.5		6.6	6.4		4.7	4.5	
Mean # of elderly (≥50 y) household members	1.6	1.6		1.7	1.8		1.6	1.5		2.1	2.1	*	2.1	2.1	†	1.7	1.7	
Mean # of married household members	2.7	2.3		2.4	2.0		1.8	1.5		1.2	1.2	ns	3.6	4.0		2.3	2.1	

Source: Estimates were computed by the authors from the Demographic and Health Survey for each country and year, or from a comparable national survey in the case of Lebanon. ^a The question about relation to household head was not asked in Tunisia.

† $p \leq .10$; * $p \leq .05$; ** $p \leq .01$; ns not significant; all other gender differences are significant at the $p \leq .001$, adjusting for sample design

are the relationship of the older adult to the household head, mean number of all household members (including the index older adult), mean number of co-resident children (less than 15 years), mean number of adult household members (at least 15 years old, including the index older adult), mean number of elderly household members (at least 50 years old, including the index older adult) and mean number of married household members (including the index older adult, if applicable). Again, clear differences are apparent in the average household composition of older women and men. In all countries and survey years, older men are the designated heads of household substantially more often than are older women and older women are the spouses of the household head substantially more often than are older men. Again in all countries and survey years, older women are the parents of the household head more often than are older men, although this gender gap declined somewhat in Egypt and Jordan between the 1990s and the 2000s. Older women's greater tendency than older men's to be a parent of the household head provides some indication that older women are more often the recipients of co-residential support across this diverse subset of Arab countries. Finally, older women tend more often than do older men to be related in other ways to the household head (Table 13.7), although these other relationships are relatively rare and not all of the gender gaps are significant. These latter differences may suggest that older women may have a wider network of co-residential support than older men in these Arab settings. Finally, Table 13.7 provides summary indicators for the mean household composition of the households in which older adults reside. In all cases except two (Egypt (2005) and Lebanon (1996)), the mean household size of households with older adults exceeds 6. Older women live in smaller households than do older men, as evidenced by the smaller average number of household members overall, child household members, adult household members, elderly household members and married household members across almost all settings and survey years.

In sum, older men are more often the designated heads of household and older women more often live alone and live, on average, in smaller households than do men. However, older women more often appear to be the recipients of co-residential support from children, children-in-law, other relatives and non-relatives.

Reasons for Gender Differences in Living Arrangements

Following a lack of attention to theory concerning the relationship of gender and aging (e.g., Mason 1992; McMullin 1995), three life course perspectives have emerged that attribute gender differences in living arrangements to differences between women and men in their marital histories, accumulated economic and health-related needs and relations with children.

First, the varied marital histories of women versus men, as well as of younger versus older generations, may account for differences in women's and men's living arrangements in later life (Aghajanian 1985; Lee and Palloni 1992). Increasing ages at first marriage among youth and women's greater tendency to be widowed (see above) may account for women's higher odds of living alone or as the head of household with dependent child (Eldemire 1997; Kim and Choe 1992; Liang et al. 1992; Ogawa and Retherford 1997). Widowhood is also associated with support-providing forms of co-residence in Arab and other settings (Yount 2005b; Lee et al. 1994; Lye 1996; Martin and Tsuya 1991).

Second, differences between women and men in their prior economic roles and health-statuses may contribute to different needs for support in later life (e.g., Hatch 2000; Hooyman 1999; Van Velsor and O'Rand 1984). Although Arab Muslim women, for example, are allowed to inherit property, they inherit less than do men and they may inherit less than their legal share because a woman is sometimes assumed to have access to the assets of her husband (Morsy 1978). In addition, low levels of employment after marriage even among educated Arab women mean that women less often have access to available, albeit often meager, public pensions (see above) (UNDP 2002). Persistent de jure and de facto inequities in the distribution of public and private financial resources make older women disproportionately dependent on financial and in-kind support from kin (Grau 2002; Mernissi 1987). Finally, older women live longer than do older men in Arab societies but in 7 of 21 countries with available data they live a higher percentage of their lives with disability (World Health Organization 2002). So, the duration of women's exposure to disability is longer than that for men. In many Arab societies, poor health has been associated with support-providing forms of

co-residence (e.g., Yount 2005b). Thus, different economic and health-related needs in later life may partly account for crude differences in older women's and men's co-residential support (e.g., Beales 2000).

Third, according to the *kin-keeping hypothesis*, children's support may be greater for aging mothers than aging fathers, even after accounting for gender differences in need, because maternal-child emotional attachments are stronger and mothers provide more family services across the life course (e.g., Gibson 1996; Hagestad 1986; Lye 1996; Risseuw 2001; Rossi and Rossi 1990; Spitze and Logan 1989; Wolf 1972; Yount 2005b). Women may also experience greater continuity of roles as they age, whereas men may experience greater role disruption as a result of exiting various productive activities (e.g., Beales 2000; Gibson 1996; Knodel and Ofstedal 2003). Compared to nonworking older men, older women may be more valued members of multi-generational households because of their greater ongoing contributions to domestic chores and kin-keeping activities (e.g., Beales 2000; Knodel and Ofstedal 2003; Lopata 2002). In Korea and among Chinese, Japanese and non-Hispanic white immigrants in the U.S., for example, older women have lived more often with an ever-married child (Kamo and Zhou 1994; Kim and Choe 1992). Widowed women in Europe, Iran, Thailand, the U.S. and Zambia have also lived more often with married children and in child-headed households and have received more visits and calls from adult children (Aghajanian 1985; Cliggett 2001; Roan and Raley 1996; Sobieszczyk et al. 2003; Spitze and Logan 1989). Yet, unmarried older women and men have received similar intergenerational transfers in Vietnam (Friedman et al. 2003) and Europe (Iacovou 2002), sometimes despite women's greater provision of care (Iacovou 2002).

Given that major differences in the living arrangements of older Arab women and men including the prevalences of living alone and of living as the parent of a (presumably support-providing) household head, Table 13.8 presents the relative odds (and 95 per cent confidence intervals) that older Arab women live in these residential arrangements, for each country with publicly available data from the DHS or comparable sources. For both outcomes, Model (1) presents the unadjusted relative odds that women live in these arrangements. Model (2) presents the relative odds that women live in these

arrangements, controlling for marital status and Model (3) controls additionally for age (a crude proxy for health status), schooling (a crude proxy for economic capital) and year of the survey (where applicable).

As is evident in Model (1), Panel (1), older Arab women have significantly higher odds of living alone than do older Arab men in all countries. These relative odds range from 2.2 in Yemen to 4.2 in Tunisia. Adjusting only for marital status, however, these relative odds are either reduced to 1.0 or are reversed in all countries. Compared to their male counterparts, women have at least 30 per cent *lower* odds of living alone in Egypt, Jordan, Lebanon, Morocco and Yemen and have similar odds of living alone in Tunisia. Including additional controls for the survey year (where possible) and the older person's age and schooling (where possible) does not substantially alter women's relative odds of living alone in any setting. Thus, across all of the Arab countries included in this analysis, women's higher odds of living alone can be accounted for entirely by their higher propensity to be widowed.

As is evident in Model (1), Panel (2), older Arab women in all countries also have significantly higher unadjusted odds than do their male counterparts of living as a parent of the household head. These relative odds range from 4.4 in Lebanon to 9.5 in Egypt. Adjusting for marital status alone reduces but does not eliminate women's higher odds of living as a parent of the household head. Adjusting additionally for the survey year (where possible), as well as the older adult's age and schooling does not appreciably alter women's relative odds of living as a parent of the household head. These results tentatively suggest that older Arab women have a higher propensity than do older Arab men of living in support-providing forms of intergenerational co-residence. Such findings are consistent with the "kin keeping hypothesis" that women's greater prior investments in children yield higher levels of co-residential support in later life, even after accounting for differences in need.

Using household data from the 1988, 1992, 1995 and 2000 Egypt Demographic and Health Survey, Yount and Khadr (2008) examined changes in the living arrangements of Egyptians aged 60 years and older and found further support for the kin-keeping hypothesis. They showed that, between 1988 and 2000, the propensity to live with any ever-married children declined (e.g., from 40 to 34 per cent for men; from 58 to 53 per cent for

Table 13.8 Unadjusted and adjusted relative odds that women live alone or as the parent of the household head, selected Arab countries

Multivariate Model	Country											
	Egypt		Jordan		Lebanon		Morocco		Tunisia ^a		Yemen	
	OR	(95 per cent CI)	OR	(95 per cent CI)	OR	(95 per cent CI)	OR	(95 per cent CI)	OR	(95 per cent CI)	OR	(95 per cent CI)
Panel 1. Living Alone												
(1) Female (unadjusted)	3.7	(3.3, 4.2)	4.1	(2.9, 5.8)	2.7	(2.5, 2.9)	2.4	(1.6, 3.5)	4.2	(2.6, 6.8)	2.2	(1.7, 2.9)
(2) Female (adjusted for marital status)	0.7	(0.6, 0.8)	0.7	(0.5, 1.0)	0.7	(0.6, 0.7)	0.5	(0.3, 0.8)	0.9	(0.6, 1.5)	0.7	(0.5, 1.0)
(3) Female (adjusted for marital status, age, schooling, and year of survey)	0.8	(0.7, 0.9)	0.8	(0.6, 1.2)	0.7	(0.7, 0.8)	0.5	(0.3, 0.8)	1.0	(0.6, 1.6)	0.7	(0.5, 1.1)
Sample size (unweighted)	50174		14836		51466		9570		4582		9933	
Panel 2. Living as Parent of Household Head												
(1) Female (unadjusted)	9.5	(8.7, 10.3)	6.0	(4.9, 7.3)	4.4	(4.0, 4.7)	6.2	(5.3, 7.2)			5.3	(4.6, 6.2)
(2) Female (adjusted for marital status)	3.0	(2.8, 3.3)	2.0	(1.7, 2.4)	1.9	(1.8, 2.1)	2.6	(2.2, 2.9)			2.5	(2.2, 2.9)
(3) Female (adjusted for marital status, age, schooling, and year of survey)	3.3	(3.0, 3.6)	2.2	(1.8, 2.7)	2.3	(2.1, 2.6)	3.3	(2.9, 3.8)			2.8	(2.4, 3.2)
Sample size (unweighted)	50174		9419		51466		9570				9933	

Source: Estimates were computed by the authors from the latest, publicly available Demographic and Health Survey for each country, or from a comparable national survey in the case of Lebanon.

Note: Confidence intervals are adjusted for the sample design.

^a Model 3 in Panel 1 controls for marital status and age. The question about relation to household head was not asked in Tunisia, so models in Panel 2 cannot be estimated.

women) and the propensity to live alone or with unmarried children rose.⁴ Compared to men, however, women continued to live more often with any ever-married children and less often with unmarried children only and the 1988 gender gap in solitary residence disappeared by 2000.

Emerging Alternatives to Intergenerational Co-residence

The above discussion of living arrangements does not address potential trends in the share of older adults who are institutionalized. Changing patterns of intergenerational co-residence and of the share of older adults in formal long-term care, may reflect not only changes in the epidemiologic profile of older adults (see below) but also competing ideals about the family among better educated, wage-earning, younger generations. Throughout the Arab world, these changes may be most dramatic among younger women (Al-Sanabary 1985; World Bank Group 2002), for whom recent gains in schooling and employment have been greatest and who face the competing demands of raising children, working and caring for frail older parents and parents-in-law (Brink 1987). The increasing representation of women in schools and offices not only alters the construction of women's social identity over the life course but may increasingly require older women to assume the roles of child-minder and domestic helper for younger, working female relatives (Seikaly 1994). One practical response in the West to the conflicting demands of younger generations and frail older adults has been the proliferation of formal, long-term care facilities for the latter group (Nazarchuk 2001). Ethnographies in Cairo have documented the emergence of such centers as early as the 1980s (Rugh 1984) and research in Egypt and Kuwait confirms that informal centers providing long-term care are emerging in hospitals and in private residences (Rugh 1981; Shah et al. 2002; Sinunu et al. 2008). According to the best available data, these centers are primarily occupied by frail and cognitively impaired older women (Sinunu et al. 2008).

⁴ Between 1988 and 2000, the percentage living alone rose from 2 to 13 per cent for men and from 3 to 12 per cent for women and the percentage living with unmarried children only rose from 41 to 45 per cent for men and from 15 to 17 per cent for women.

So, what are other potential implications for older Arabs of intergenerational co-residence versus placement into long-term care? Often, the implications of the former are assumed to be positive, whereas those of the latter are assumed to be negative. During Lebanon's civil war (1980s), however, residence with an adult married child was associated with a significantly higher risk of mortality for older men and women and the circumstances surrounding co-residence during this conflict may have accounted for such associations (Sibai et al. 2007). At the same time, research in greater Cairo has documented frequent visitation and intense emotional and instrumental support from the adult children of older adults who live in long-term care (Sinunu et al. 2008). Thus, future research on the well-being of older Arabs should focus on the quantity and nature of their exchanges with adult children in addition to their living arrangements.

Health of Older Adults in the Arab World

Trends in the demography of aging in Arab countries have been accompanied by an epidemiological transition, with non-communicable and degenerative diseases replacing communicable diseases as the leading causes of death and morbidity. Starting in the mid-to-late 1990s, epidemiological research in the Arab world has witnessed a shift in its focus to non-communicable diseases and mainly those of the circulatory system. Similarly, studies among older adults have focused on debilitating diseases such as musculoskeletal problems, hearing and vision problems and deterioration in activities of daily living. This section presents an overview of the major prevalent diseases among older adults in the Arab world to the extent that data permit. Diseases of the circulatory system and their major risk factors (hypertension, hypercholesterolemia, diabetes, obesity and smoking), are discussed first. Data on cancer, the mental health status of older adults and musculoskeletal conditions including osteoporosis, fractures and disabilities are then reported. The section ends with an overview of health care for the elderly population in the region. The information presented here is gathered from articles retrieved from PubMed and Medline as well as

reports published by the World Health Organization and other non-governmental organizations. Except for few studies relying on self-reported disease, the majority of the figures is obtained from objective clinical measures of disease. Diagnoses of depression and dementia relied on screening tests and interview instruments, such as the Geriatric Depression Scale (GDS) and the Mini Mental State Examination (MMSE). Two limitations of this section are the lack of comparable national data and the scarcity of elderly or gender-specific studies in some countries.

Diseases of the Circulatory System and Associated Risk Factors

Circulatory Diseases

Cardiovascular and cerebrovascular (stroke) diseases remain the leading causes of mortality in the region whether reported in death certificates, Ministry of Health databases, or based on verbal autopsies. In Kuwait, for example, ischemic heart disease (IHD) is the first cause of death, with a mean annual mortality rate of 58 and 31 per 100,000 persons per year in men and women, respectively (El-Shazly et al. 2004). In Beirut, Lebanon, circulatory diseases account for around 60 per cent of all-cause mortality in persons aged 50 years and older (Sibai et al. 2001) and in Jordan and Bahrain, they contribute to respectively 42 per cent and 33 per cent of causes of death in all age groups (Hamadeh 2000; Khoury et al. 1999). Despite the on-going war in Iraq, diseases of the circulatory system account for the majority of deaths (54 per cent) outnumbering war casualties as the leading cause of death among older adults (Burnham et al. 2006).

Similarly, circulatory diseases account for a high percentage of the burden of disability and morbidity (Table 13.9). Based on available data, Lebanon has one of the highest prevalence rates of cardiovascular diseases among older men (22 per cent) and women (19 per cent) (Sibai et al. 2003b). These figures are comparable to those reported in the US among men (27 per cent) and women (17 per cent) aged 80 years and older (Kannel 2002). Studies from Jordan and the UAE report lower prevalence rates (11–20 per cent) (Centers for Disease Control and Prevention (CDC),

2006a; Margolis, Carter, Dunn, and Reed 2003). In three recent studies, stroke also accounted for a prevalence of around 5 per cent in Ismailia, Egypt (Yount 2008), 3 per cent in Lebanon (Tohme et al. 2005) and 4 per cent in Jordan (Youssef 2005).

Circulatory Disease Risk Factors

The increasing prevalence of diseases of the circulatory system is closely linked to the ongoing increase in the prevalence rates of their established risk factors. Studies have shown that circulatory disease risk factors comprising of hypertension, hypercholesterolemia, diabetes, obesity and smoking contribute to a great disease burden worldwide. Hypertension has been identified as the leading risk factor for death and ranks third as a cause of disability adjusted life years (Ezzati et al. 2002), and diabetes is known to be a “coronary disease equivalent”. High cholesterol levels and smoking have been shown to increase the risk of cardiovascular diseases by two to three times. Obesity in itself is one of the major risk factors for impaired quality of life and diabetes and diabetic individuals often suffer from severe disabling conditions, such as vision impairment, leg amputation and liver failure. Of significance, is that these circulatory disease risk factors are modifiable factors and are amenable to interventions. Hence, they are the most targeted factors in national health campaigns and in primary prevention programs worldwide and in the Arab countries.

Overall, cardiovascular disease risk factors prevalence rates in the Arab region are notably high and are sometimes higher than those reported in developed countries reaching three to four times the rates reported in the US (CDC 2006b). Tables 13.10–13.12 summarize the prevalence rates of the major cardiovascular disease risk factors in selected Arab countries. Compared to other Arab countries, North African countries such as Morocco and Tunisia have the highest prevalence rates of hypertension (70 per cent) and hypercholesterolemia (37 per cent among men and 61 per cent among women) (Laouani et al. 2004; Tazi et al. 2003). Diabetes, on the other hand, shows comparable rates in the majority of Arab countries reaching more than 30 per cent in countries such as Saudi Arabia and the United Arab Emirates (Al-Nozha et al. 2004; Malik et al. 2005; Margolis et al. 2003).

Table 13.9 Country-specific prevalence (per cent) and incidence (per 100,000/year) of circulatory diseases among older adults in the Arab countries

Country	Authors	Year	Men	Women	Total
Cardiovascular diseases (IHD, MI)					
Jordan	CDC	2006			
50-64			-	-	11.2 %
65+			-	-	13.4 %
Lebanon	Sibai et al. (b)	2003	22.0 %	18.6 %	
Saudi Arabia	Al-Nozha et al.	2004	5.9 % ^a	4.4 % ^a	9.3 % ^b
Tunisia ^a	Ben Romdhane et al.	2004			
Tunis			163.8	43.4	-
Ariana			161.9	61.1	-
BenArous			170.5	44.6	-
UAE	Margolis et al.	2003	21.0 %		11.0 %
Cerebrovascular diseases (Stroke)					
Ismailia, Egypt, 50+ ^c	Yount	2008	5.5 %	3.5 %	
Jordan	Youssef	2005			4.0 %
Kuwait	Abdul Ghaffar et al.	1997			
60-69			851.8	353.1	649.3
70-99			489.0	802.8	626.3
Lebanon	Tohme et al.	2005	2.3 %	4.2 %	3.1 %
Libya	Ashok et al.	1986			
60-69			390.0	310.0	348.0
70+			545.0	354.0	457.0
Saudi Arabia ^a	Al Rajeh et al.	1998			125.8
Tunisia, 45+	Mrabet et al.	1990			193.2
Tunis					0.6-1.4 %
Kelibia					0.72 %

Notes. All figures refer to age 60 and above except when indicated otherwise and to incidence per 100,000 per year except when a per cent (prevalence) is indicated. IHD refers to ischemic heart diseases, and MI refers to myocardial infarction

^a Age-standardized for the whole population.

^b In the age groups 60 to 70 years.

^c Figures for Ismailia are based on subjective report of doctor-diagnosed stroke.

Where available, findings from more recent studies suggest an increasing trend in the prevalence of both hypertension and diabetes overtime (Tables 13.10–13.11). In Tunisia, for example, the overall prevalence of hypertension increased by almost 20 per cent between 1995 and 2004 (Ghannem and Hadj Fredj 1997; Laouani et al. 2004) and in Bahrain and Libya, the prevalence of diabetes almost tripled in the past decade (Al-Mahroos and McKeigue 1998; Kadiki and Roaed 1999; Kadiki and Roaeid 2001; Musaiger 1992). Various studies have shown higher prevalence rates of hypertension and diabetes among the illiterate and in individuals living in urban areas with regional variations often being attributed to differences in lifestyle and occupation (Abolfotouh et al. 2001a; Bougherra et al. 2007; Jackson et al. 2001; Salti et al. 1997).

Individuals involved in agricultural work, for example, have been reported to have lower prevalence rates of hypertension than those in more sedentary occupations (Abolfotouh et al. 2001a).

Of significance are the alarming levels of obesity (Table 13.12), most notably among women, in oil-rich countries such as Bahrain, Kuwait and the UAE (Jackson et al. 2001; Kingdom of Bahrain, Ministry of Health 2002; Malik et al. 2003; Margolis et al. 2003; Musaiger and Al-Mannal 2001) and in Tunisia (Harzallah et al. 2005). Health professionals in the Arab region note a major surge in obesity rates (Musaiger 2004a). For example, the prevalence of obesity among women in Kuwait is around 40 per cent, which places the country among the highest rates in the world (Kandela 1999). The increasing prevalence of obesity

Table 13.10 Country-specific prevalence rates of hypertension among older adults in selected Arab countries

Country	Author	Year of publication	Men	Women	Total
Egypt	Ibrahim et al.	1996			
55-64			40.9	55.3	48.2
65-74			54.4	64.8	59.4
75+			48.0	65.0	56.6
Ismailia, Egypt, 50+ ^a	Yount	2008	26.5	46.3	-
Jordan	CDC	2006			
50-64			-	-	43.0
65+			-	-	52.8
Lebanon	Tohme et al.	2005			
60-69			41.0	60.6	48.6
70+			53.4	64.6	58.7
Morocco	Tazi et al.	2003			
55-64			-	-	63.3
65-74			67.7	76.5	70.7
75+			-	-	71.7
Qatar ^b	Brener et al.	2004	32.7	31.7	32.1
Saudi Arabia					
Abha city, 65+	Abolfotouh et al.	2001	17.5	27.6	21.3
Al-Qassim, 60+	Kalantan et al.	2001	33.0	29.0	55.0
Riyadh city, 60+	Saeed et al.	1996	-	-	31.3
Tunisia					
60+	Laouani et al.	2004	-	-	69.3
60-69	Ghannem et al.	1997	56.7	51.9	53.4
70+			56.4	57.4	57.0
UAE, 60+	Margolis et al.	2003	26.0	41.0	

^a Based on subjective report of doctor-diagnosed hypertension.

^b Age-standardized for the whole population.

in the region has been attributed, in various studies, to a multitude of factors. Modernization, a shift from an agricultural to non-agricultural economy and an increased consumption of food rich in fat have been reported as important factors affecting nutritional habits, physical activity and levels of obesity among populations in middle and high-income Arab countries. Outdoor activities are hampered in many countries of the region by the lack of public parks, beaches and walking and bicycle lanes and additionally, by the hot climate in the Persian Gulf. The traditional Arab culture that promotes “plumpness” as an attractive physique for women and values it as a sign of beauty, health and affluence has been suggested as an additional underlying factor for the alarming prevalence of obesity among women in these settings. Overall, older women in most Arab countries are less likely to have ever been members of the workforce and are often expected to stay at home for household chores and to care for children, restricting further

their physical activity. As elsewhere in the world, the growing pandemic of obesity throughout the Gulf reaching around 50 per cent among older adults in Kuwait, Bahrain and the UAE (Jackson et al. 2001; Malik et al. 2003; Musaiger and Al-Mannal 2001) is soon expected to extend to other Arab countries leading to a higher prevalence of circulatory diseases and a greater burden of non-communicable diseases (Al-Nozha et al. 2004; Bougherra et al. 2007; Kadiki and Roaeid 2001; Salti et al. 1997).

As early as the 1970s, the WHO has described tobacco smoking as an epidemic (WHO 1979) and more recently have cautioned that, within the next 30 years, 70 per cent of deaths from smoking attributable disease will occur in developing countries (WHO 1996). Studies conducted among adolescents, adults and older adults have consistently shown Egypt to have the highest rate of tobacco consumption in the MENA region (Nassar 2003). Cross-country comparisons show wide variations in prevalence rates

Table 13.11 Country-specific prevalence rates of diabetes among older adults in selected Arab countries

Country	Author	Year	Men	Women	Total
Bahrain					
60+	Al-Mahroos et al.	1998	29.6	37.6	-
65+	Musaiger	1992	10.2	15.0	12.9
Ismailia, Egypt, 50+ ^a	Yount	2008	13.4	18.8	-
Jordan	CDC	2006			
50–64			-	-	19.6
65+			-	-	24.7
Kuwait					
55+	Jackson et al.	2001	33.7	30.4	-
60+	Abdella et al.	1998	-	-	38.2
Lebanon					
60–69	Tohme et al.	2005	25.6	27.3	26.3
70+			28.8	32.3	30.4
60–64	Salti et al.	1997	23.1	24.1	23.7
65+			28.5	30.2	29.4
Libya					
60–69	Kadiki et al.	2001	34.3	38.7	36.4
70+			33.3	21.4	28.1
60–64	Kadiki et al.	1999	6.7	11.0	8.8
65–69			4.1	5.8	4.9
70+			3.6	4.0	3.8
Morocco					
55–64	Tazi et al.	2003	-	-	18.0
65–74			-	-	15.6
75+			-	-	8.8
Oman					
60–69	Al Asfour et al.	1999	19.5	24.0	-
70–79			26.8	35.3	-
80+			36.4	42.9	-
Saudi Arabia					
60–70	Al-Nozha et al.	2004	36.2	36.9	36.5
Abha city, 65+	Abolfotouh et al.	2001	33.1	27.1	31.1
Tunisia					
60–69	Bougherra et al.	2006	15.5	23.3	-
70+			16.2	19.0	-
60+	Laouani et al.	2004			23.0
Soussa city, Tunisia	Ghanem et al.	1997			
60–69			21.6	22.8	22.4
70+			5.1	27.9	19.0
UAE, 60+	Margolis et al.	2003	35.0	39.0	37.0

^a Based on subjective report of doctor-diagnosed diabetes.

for smoking among older adults with available data revealing a ten-fold difference across Arab countries (Table 13.13). For example, while older men in Bahrain, Egypt, Jordan, Lebanon, Morocco and Tunisia appear to show prevalence rates of smoking between 30 and 50 per cent (CDC 2006a; Chaaya, Sibai, and El-Chemaly 2006; Ghannem and Hadj Fredj 1997; King-

dom of Bahrain, Ministry of health 2002; Musaiger 2004b; Tazi et al. 2003; Yount and Khadr 2005), contemporary rates in Oman and the UAE are much lower (7–15 per cent) (Al Riyami and Afifi 2004; Ministry of health [UAE], 2003). Among older women, smoking prevalence is, to date, notably low and except for a few countries, Bahrain (24.8 per cent) and Leba-

Table 13.12 Country-specific prevalence rates of obesity among older adults in selected Arab countries

Country	Author	Year	Men	Women	Total
Bahrain					
60+	Musaiger et al.	2001	12.5	47.1	
60-69	Ministry of Health	2002	19.3	28.0	
70+			9.6	18.1	
Jordan					
50-64	CDC	2006			30.7
65+					28.0
60+	Ajlouni	1998	33.7	65.8	
Kuwait					
61-66	Jackson et al.	2001	29.7	11.1	
67-72			17.6	50.0	
73-80			16.7	22.8	
Lebanon					
60+	Sibai et al.	2003 a	15.3	38.0	
institution- based	Sibai et al.	2003 b	2.3	5.3	4.0
country-based			19.5	30.5	26.0
Morocco					
55-64	Tazi et al.	2003			17.3
65-74			9.2	13.8	12.9
75+					6.7
Saudi Arabia					
Abha city, 65+	Abolfotouh et al.	2001	34.1	29.2	32.4
50+	Warsy et al.	1999	16.4	28.7	
Tunisia					
Tunis, 40+	Harzallah et al.	2005	52.7	51.7	52.1
60+	Laouani et al.	2004			24.2
UAE					
60+	Margolis et al.	2003			30.0
60-64	Malik et al.	2003	25.8	46.7	
65-69			27.5	39.3	
70-74			20.6	26.7	

non (17.3 per cent) (Chaaya et al. 2006; Musaiger 2004b), consumption of cigarettes does not exceed 5 per cent in the majority of Arab countries. Women in Arab countries usually start smoking at a later age and report smoking fewer cigarettes than men (e.g., Baron-Epel and Haviv-Messika 2004; Global Youth Tobacco Surveillance Group 2003; World Health Organization 2006). Socio-cultural norms prevailing in some societies disapprove of women smoking in public considering it as an improper or indecent behavior (Al-Riyami and Afifi 2004). Hence, women tend to deny their smoking behavior, even if present and underestimate their frequency of smoking. In spite of this, several studies indicate that younger women are increasingly adopting smoking behaviors that parallel those of men (Tamim et al. 2003), risking older adults of future generations.

Waterpipe (shisha or narghile) smoking, another common type of smoking in Arab countries, is on the increase among younger and older adults alike (Maziak et al. 2004). Research on the use of waterpipe remains limited compared to that on cigarette use. Nevertheless, available data suggest a prevalence rate of waterpipe smoking among older adults reaching around 11 per cent (Chaaya et al. 2006) and more than 30 per cent among adults and youth (Maziak et al. 2004). If current trends in waterpipe smoking continue as younger adults reach older ages, the figure for older adults is expected to increase.

Circulatory diseases and their risk factors are amenable to intervention and the extent of our understanding of disparities in prevalence rates across various geographic districts and socio-demographic subpopulations is key to our effort in planning relevant intervention programs.

Table 13.13 Country-specific smoking prevalence rates among older adults in selected Arab countries

Smoking	Author	Year	Men	Women	Total
Bahrain					
60+	Musaiger	2004	38.6	24.8	-
60-69	Ministry of Health	2002	28.9	33.2	-
70+			28.6	26.1	-
Ismailia, Egypt (50+)	Yount and Khadr	2005	52.9	5.4	-
Jordan					
60+	Ministry of health	2006	32.5	9.6	-
50-64	CDC	2006	-	-	22.1
65+			-	-	14.8
Lebanon					
60+	Zeki al Hazzoury	2006	41.6	17.3	28.1
60-64	Chaaya et al.	2006	-	-	38.0
65-69			-	-	30.0
70+			-	-	16.0
Morocco					
	Tazi et al.	2003	34.5 ^a	0.6 ^a	
55-64			-	-	22.5
65-74			-	-	12.7
75+			-	-	9.8
Oman					
60-64	Al Riyami et al.	2004	7.4	2.2	5.2
65+			7.9	0.8	4.8
Saudi Arabia					
60+	Jarallah et al.	1999	-	-	8.0
Tunisia					
60-69	Ghannem et al.	1997	45.9	2.5	16.4
70+			48.7	4.9	22.0
UAE					
60+	Margolis et al.	2003			4.0
60-69	Ministry of Health	2003	14.8	1.3	9.5
70+			6.5	1.5	4.2

^a Age-standardized for the whole population.

Cancer

Based on death certificates and verbal autopsy reports, cancer is the second leading cause of death in Arab countries. It accounts for 34 per cent of deaths in Kuwait, 13 per cent in Jordan and 15 per cent in Lebanon (El-Shazly, Makboul, and El-Sayed 2004; Houry, Massad, and Fardous 1999; Sibai, Fletcher, Hills, and Campbell 2001). For morbidity figures, cancer registries remain the most comprehensive sources of routinely collected data. However, the establishment of national cancer registries is relatively recent in the region, with only Algeria, Tunisia, Egypt, Lebanon, Jordan and the Gulf countries having instituted national cancer registries (Elattar 2005). Furthermore, elderly-specific data on the prevalence of cancer is

largely lacking in the region and hence, the proportional distribution of various types of cancer in the total population of each country can only be presented. The information presented here within is largely abstracted from Globocan (2002) and published data based on selected national cancer registries, wherever available (Elattar 2005; Shamseddine et al. 2004).

As elsewhere, breast cancer remains the most common type of cancer among women in several countries of the region, accounting for over 50 per cent of all cancers. This is followed by cervical cancer, non-Hodgkin Lymphoma (NHL) and thyroid cancer. In contrast, differences across countries are more pronounced among men. Whereas lung cancer is the leading cancer among men in Tunisia, Algeria and Jordan, bladder cancer ranks first in Egypt and Lebanon, NHL in Saudi Arabia and Yemen and colorectal cancer in

Kuwait. The second leading type of cancer is bladder cancer in Tunisia, Algeria and Jordan, liver cancer in Egypt and Saudi Arabia, NHL in Kuwait and lung cancer in Lebanon. These cross-country differences are partly explained by different prevalence rates of smoking between countries and by the presence of environmental risk factors such as schistosomiasis in Egypt closely related to the high rates of bladder cancer.

Mental and Cognitive Impairments

Psychological problems, such as depression and cognitive impairment, are common among older adults and pose major threats not only for the afflicted older persons but also for their caregivers. Overall, research on psychiatric morbidity in Arab countries is sorely lacking, notably among the older populations. Nevertheless, available literature suggests that, as elsewhere, depression is the most common psychiatric problem among older adults reaching over 50 per cent in Tunisia (Andrews 1998) (Table 13.14). Using the Geriatric Mental State Interview (GMS-A3), a national study in the UAE revealed an overall prevalence of depression of 20 per cent among older adults. This figure, however, masks a three-fold difference in the prevalence of depression across areas within the UAE, ranging from 11 per cent in Al Ain and 13 per cent in Ras al Khaimah to 29 per cent in Dubai (Ghubash et al. 2004). Using the Geriatric Depression Scale (GDS), comparable prevalence rates (24 per cent) were found in Jordan and in three communities in Lebanon (Youssef 2005; Zeki al Hazzouri 2006). As elsewhere, studies have consistently shown that depression is more common among women, the very old, the institutionalized and the divorced, separated, or widowed. Depression has also often been associated with low levels of schooling, insufficient income, unemployment, solitary living and poor physical health or dependence on others (Abolfotouh et al. 2001b; Al-Shammari and Al-Subaie 1999; Chahine et al. 2006; Ghubash et al. 2004; Youssef 2005).

Using the Mini Mental State Examination (MMSE), countries in the region show wide variations in cognitive dysfunction, with women being at a significantly higher risk than men. The MMSE items that were used, however, varied between the studies, which hinders adequate cross-country comparisons. Whilst Saudi Arabia had the lowest prevalence rates of cognitive

impairment among older men (6 per cent) and women (26 per cent) (Al-Shammari et al. 2000), the respective rates in selected governorates in Egypt (39 and 42 per cent) and the UAE (18 and 40 per cent) are notably higher (Andrews 1998; Margolis et al. 2003). Among the institutionalized elderly, cognitive impairment is particularly elevated in Lebanon (60 per cent) and in the UAE (80 per cent) (Chahine et al. 2006; Margolis and Reed 2001) and qualitative research in Egypt suggests that cognitive impairment is one of the leading reasons to place an older adult into formal long-term care (Sinunu et al. 2008).

As elsewhere, dementia is the most common cause of cognitive impairment in the Arab states, with the majority being caused by Alzheimer's disease (AD). A cross-sectional study conducted among the elderly in Assiut province in Egypt revealed a crude overall prevalence of clinically diagnosed dementia of about 5, increasing to 19 and 25 per cent, respectively, among men and women aged 85 years and older (Farrag et al. 1998).

Margolis et al. (2001, 2003) noted that the lack of awareness of psychiatric morbidity among primary care physicians and the overall under-prescription of psychoactive drugs hinder "healthy aging." Health care workers need to be trained to screen for and to be able to treat early signs of depression among older adults.

Musculoskeletal Disorders

Population-based prevalence studies on musculoskeletal problems, mainly arthritis and osteoporosis, among older adults are very recent in the Arab countries with the majority being conducted within the past few years. Musculoskeletal disorders have been diagnosed in 24 and 36 per cent of older adults in Saudi Arabia and Jordan, respectively (Al-Shammari et al. 2000; Youssef 2005). Arthritis was reported by a quarter of the study sample in three underprivileged communities in Lebanon and by a higher percentage (44 per cent) in the UAE and in Ismailia, Egypt (56 and 35 per cent in women and men aged 50 and above) (Khadr and Yount, nd; Margolis et al. 2003; Zeki Al Hazzouri 2006). An estimated 31 and 35 per cent of older Bahraini men and women, respectively, have osteoarthritis (Musaiger 2004b).

Osteoporosis, a "silent killer" among older adults if not promptly diagnosed and treated, is notably

Table 13.14 Depression, functional impairments, and self-rated health among older women and men, selected Arab countries

Country	Depression	ADL dependent	Poor vision	Poor hearing	Poor self-rated health
Ismailia, Egypt					
M	2.5 ^a	19.3 ^b	50.4 ^c	89.7 ^c	22.1 ^d
W	3.8	44.9	53.8	90.3	30.5
Total	-	-	-	-	-
Egypt					
M	27.1	22.4	59.5	12.0	40.0
W	39.1	28.5	65.7	9.4	50.0
Total	-	-	-	-	-
Jordan					
M	17.1	27.1	21.4	24.3	35.0
W	30.6	28.7	37.5	20.0	51.9
Total	24.3	28.0	30.0	22.0	44.0
Lebanon					
M	16.8	18.5	17.1	12.2	19.6
W	29.6	31.2	26.3	22.0	33.2
Total	23.5	25.6	21.0	18.0	27.1
UAE					
M	-	22.0	-	-	-
W	-	17.5	-	-	-
Total	20.2	-	-	-	5.0
Saudi Arabia					
M	32.1	15.7	46.1	19.5	17.2
W	51.1	24.4	46.1	20.5	34.1
Total	38.9	18.8	46.1	19.9	23.2
Tunisia					
M	49.8	32.0	80.5	39.4	39.5
W	68.3	46.8	88.4	43.1	60.9
Total	-	38.4	-	41.1	49.5

Sources: Andrews (1991); Al-Shammari et al. (2000); Ghubash et al. (2004); Margolis et al. (2003); Sibai et al. (2003b); Yount and Agree (2005); Yount and Khadr (2005); Youssef (2005).

^a Unpublished estimates computed by the authors. The estimate shown is the mean of the sum of 13 depressive symptoms.

^b Any reported difficulty with ADLs (bathing, dressing, eating, getting in/out of a chair/bed, walking, going outside, getting to toilet and using it).

^c Unpublished estimates computed by authors. Compares poor/very poor vision and hearing to very good, good, and fair.

^d Compares poor and very poor self-rated health to very good, good, and fair

prevalent in the region. The introduction of bone mineral density measurement and screening campaigns have played a significant role in increasing awareness and diagnosing osteoporosis in selected Arab countries. Saudi Arabia exhibits the highest prevalence rates, varying between 40 and 45 per cent among post-menopausal women (El Desouki 2003; Sadat-Ali et al. 2004) and reaching almost three-quarters in women between the ages of 70 and 80 years (El Desouki 2003). Studies based on clinically diagnosed osteoporosis have consistently shown higher prevalence rates than those based on self-reported morbidity. For example, while the prevalence of clinically

diagnosed osteoporosis was estimated at 35 per cent of Qatari women aged 50–69 years (Hammoudeh, Al-Khayarin, and Bener 2005) and in 30 per cent of Jordanian women aged 19–85 years (Shilbayeh 2003), lower prevalence rates have been self-reported among older adults in Lebanon (24 per cent women, 3 per cent men) (Zeki Al Hazzouri 2006) and in Ismailia, Egypt (5 per cent women, 1 per cent men) (Khadr and Yount nd).

As a result of the high prevalence of osteoporosis, the incidence of hip fractures is expected to be similarly elevated. The limited data indicate that hip fracture is prevalent in Saudi Arabia (Al-Nuaim et al.

1995) and Lebanon (Baddoura, Okais, and Awada 2001), with an annual incidence reaching almost 4 and 2 per cent among older women and men, respectively. Osteoporosis among women in Gulf countries has been attributed to a lack of sufficient exposure to sunlight. Because of the notably hot climate in these countries, women are less likely to leave their air-conditioned residences and, when they do, they are often wearing veils (El Desouki 2003). In comparison, lower incidence rates have been reported in North African Arab countries, such as Morocco (52 and 43 per 100,000 among women and men aged 50 and above in Rabat, respectively) (El Maghraoui et al. 2005).

Functional Impairments and Disability

The high prevalence of musculoskeletal disorders in selected Arab states, especially among women, reflects itself in a similarly high prevalence rate of functional disability. Variations in physical dependence among older adults are noted across Arab countries, where data is available, with the prevalence of difficulties in activities and instrumental activities of daily living (ADL and IADL) showing consistent distribution as countries with high ADL difficulty also report high IADL difficulty (Table 13.14). The highest prevalence rates of limitations in ADL were reported in Tunisia, Egypt, Jordan and Lebanon (varying between 25 and 38 per cent) (Andrews 1998; Youssef 2005; Zeki Al Hazzouri 2006), followed by the UAE and Saudi Arabia (17–19 per cent) (Al-Shammari et al. 2000; Ghubash et al. 2004; Margolis et al. 2003). Studies have consistently shown that limitations in ADL and IADL are more prevalent in women than in men but objective measures of functional limitations are lacking and women may tend to over-report such disabilities (Khadr and Yount, nd). Furthermore, in contrast to ADL difficulty, reports of difficulty with IADLs are sensitive to gender roles and to living conditions (Yount and Agree 2005; Zeki Al Hazzouri 2006). Correlates of disablement among men were illiteracy, ill-health and unattended medical needs; whereas injury, living in poor settings and a higher number of living children were correlated with disablement among women (Lamb 1997; Youssef 2005).

The ability to perform physical tasks (PT) such as kneeling, lifting weights, climbing stairs and walking is another measure used to assess disability among older adults. This measure is presumably independent of one's physical and social environment (e.g., cultural and gender roles), which would increase its validity and reproducibility and thereby make it preferable to measures of ADL and IADL disability (Nagi 1976; Yount and Agree 2005). Lower performance in PT has also been associated with chronic physical and mental health problems (Youssef 2005; Yount and Agree 2005; Zeki Al Hazzouri 2006). In Egypt, Tunisia, Jordan and Lebanon, older women have consistently reported higher difficulty in performing physical tasks than have men (Yount and Agree 2005; Youssef 2005; Zeki Al Hazzouri 2006). The highest prevalence rates of restriction in PT were reported in Egypt (71 per cent in males and 88 per cent in women) and Tunisia (50 per cent in men and 76 per cent in women) (Yount and Agree 2005). These rates are followed by those in Jordan and Lebanon, where overall rates of PT impairment of 60 per cent (Youssef 2005) and 45 per cent (Zeki Al Hazzouri 2006) have been documented, respectively.

In addition to functional impairment and physical dependence, many older adults in Arab countries have vision and hearing impairment that adversely affect their daily lives (Table 13.14). Wide variations in such impairments exist across countries (20–80 per cent for vision impairment; 10–40 per cent for hearing impairment), and these figures are generally higher than those in the U.S. (17 per cent for visual impairment; about 11 per cent for hearing problems) (CDC 2006b). Finally, the poor health status of older adults in Arab countries is reflected in high levels of poor self-rated health, with almost half of older adults in Egypt (Andrews 1998), Jordan (Youssef 2005) and Tunisia (Andrews 1998) describing their health status as poor or very poor.

Implications for Life Expectancy

The above discussion reveals high levels of illness from non-communicable diseases as well as high levels of cognitive and physical impairments among older

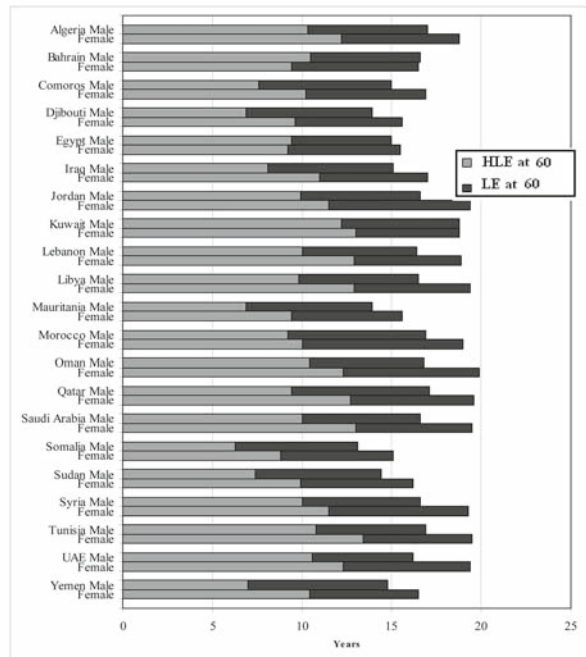
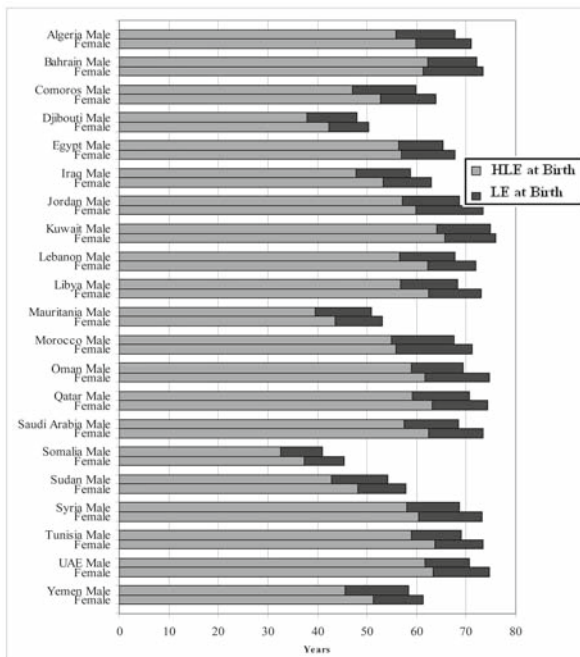
adults in Arab countries. The discussion also reveals substantial differences in the health profiles of women and men, with rates of CVD and smoking higher in men, rates of diabetes, obesity, hypertension, depression and ADL disability higher in women and inconsistent gender gaps in cerebrovascular diseases across Arab countries. Figure 13.3 summarizes the implications of these poor health states and premature mortality associated with them by comparing, for each country and for women and men separately, estimates of life expectancy at birth and at age 60 years with estimates of health-adjusted life expectancy at birth and at age 60 years for the year 2001. Estimates of healthy life expectancy (HLE) are based on life expectancy (LE) but include adjustments for time spent in poor health. HLE measures the equivalent number of years in full health that a newborn child can expect to live based on the current mortality rates and prevalence distribution of health states in the population.

On average, men in the Arab countries represented here can expect to live an average of 64 years from birth (range 41–75 years); however, these men can expect to live an average of 11 fewer healthy years (range 9–13 years) after accounting for levels of ill-

ness and disability. In comparison, women in the same countries can expect to live an average 68 years from birth (range 45–76 years) but an average of 11 fewer healthy years (range 8–16 years) after accounting for levels of illness and disability. A similar pattern is apparent for life expectancy and healthy life expectancy at age 60 years. Men who survive to age 60 years live, on average, another 16 years (range 13–19 years) but illness and disability diminish this estimate to an average of 9 healthy years (range 6–12 years). By comparison, women who survive to age 60 years live, on average, another 18 years but illness and disability also diminish this estimate to an average of 11 healthy years (range 9–13 years). Thus, with few exceptions, women in Arab countries tend to live more years and more healthy years than do men, regardless of the age at which these estimates are computed.

Elderly Health Care in the Region

The high prevalence of non-communicable diseases and disability among older adults suggest a need for



Source: World Health Organization (2002)

Fig. 13.3 Life expectancy (LE) and healthy life expectancy (HLE) at birth and at age 60 years, Arab countries in 2001

specialized health care for this segment of the population. Because Arab culture places enormous respect on elders and obligations on family to support them in old age (Sinunu et al. 2008), most Arab older adults live at home and receive care from their children, spouses, or other close relatives. To date, the number of institutionalized older adults remains low in most Arab countries (Al-Shammari et al. 2000; Boggatz and Dassen 2005; Margolis and Reed 2001) but accurate estimates of the proportion institutionalized are unknown. In the UAE, for instance, the estimated prevalence of institutionalization among the elderly is 7–14 per 1000 persons aged 65 and older, which is almost six times lower than rates in the U.S. (Margolis and Reed 2001). The dependence on house-helpers and full-time maids to care for disabled older adults, which is common in the UAE and other rich countries, is likely to contribute to lower rates of institutionalization (Margolis and Reed 2001). However, with industrialization, a decline in extended family, enhanced education for women and their increased participation in the work force, there is an increasing pressure on families and caregivers to institutionalize older adults (Al-Shammari et al. 2000; Sinunu et al. 2008). Recent reports indicate that family members are increasingly no longer able to care for their frail elder family members, particularly those with the most severe disabilities (Margolis and Reed 2001; Sinunu et al. 2008).

Overall, although aging has long been a priority in wealthier countries, only recently has it become a concern in some Arab countries. For example, there is a lack of specialization in and teaching of geriatric medicine in all Arab countries (Al-Shammari et al. 2000; Chemali et al. 2008; Keller et al. 2002; Margolis et al. 2003; Youssef 2005). Also, nursing homes, if available, are ill-prepared to house chronic patients (Hafez, Bagchi, and Mahaini 2000) and only those individuals who belong to the middle or high- social class can afford to place their elders into formal long-term care (Sinunu et al. 2008). Because of a lack of adequate geriatric facilities, the elderly are usually treated by general internists or practitioners and, in Gulf Cooperation Council (GCC) countries, are admitted to acute care hospitals (Al-Shammari et al. 2000; Margolis and Reed 2001). Many older adults complain about the inaccessibility or unavailability of specialized home services (Youssef 2005) and a lack of social or economic support to the caregivers prevails (Atallah et al. 2005).

In conclusion, older adults in the Arab world are expected to increase in number and as a percentage

of the general population. With an increasing prevalence of non-communicable diseases and their associated risk factors and consequences, the emerging health profile of older Arabs in many ways is reflecting that of older adults in the West. However, the high prevalence of non-communicable diseases in several countries in the region does not replace completely the burden of communicable diseases such as HIV, tuberculosis, schistosomiasis and malaria especially in African countries, where the double burden of infectious and chronic diseases prevails. Preventive geriatric medicine and the establishment of national geriatric curricula are greatly needed to promote “healthy aging” in all Arab countries. There is also a need to promote, support and fund research on older adults among scholars within the region. Having more accurate estimates of trends in the burden of disease and in health-care provision and use among older Arabs would inform evidence-based policies for the elderly, their families and caregivers.

Conclusions and Recommendations for Future Research

The above discussion reveals several important implications of the demography and epidemiology of aging in Arab societies.

First, despite a “stalled” fertility decline in some Arab countries through the 1980s, several Arab countries are already experiencing population aging and population aging in the majority of Arab countries is imminent. Epidemiologic research already reveals high levels of chronic, non-communicable diseases and disabilities among the current population of older Arabs and these levels are expected to rise along with the growing number and percentage of older adults in the region. Such trends are already placing heavy burdens on families, who face the competing demands of women’s increased labor force participation and the high costs of children’s education and care. In some cases, families are simply not equipped to meet the needs of their longer-lived but severely disabled older relatives and one result has been the emergence of “ad hoc” forms of long-term care, including extended hospital stays and paid domestic help. These services, however, are largely private and so are accessible only to the most privileged. In the long run, policy makers in many Arab societies will need to

consider ways to promote the systematic development of training in geriatric care as well as the expansion of formal long-term care centers where they are most needed. Research in the area is also needed to document the nature and scope of these needs as they evolve, so that policies to assist frail elders and their families are suited to existing demands.

Second, the current generation of older adults in most Arab countries exhibits certain social and economic vulnerabilities that have important implications for their care. These vulnerabilities include very low levels of schooling attendance and attainment, high rates of widowhood and high levels of extended workforce participation into the last years of life. Older women experience certain of these vulnerabilities more acutely than do older men, such as poor schooling achievements resulting from poor prior investments in women's schooling and legal and customary structures that reinforce women's financial dependence on marriage and family. These disadvantages, combined with relatively high rates of widowhood and solitary living among older women, raise important questions for research and policy about the extent to which older women's social, economic and health-related needs are being met. At the same time, many older men face the burden of continued work after the legal age of retirement, usually because old-age insurance systems are deficient in Arab countries and men bear the responsibility of providing financially for their families. As a result, more research is also needed on the formal and informal productive activities of older men (and women) to understand their myriad effects on later-life health and well-being. Such research would encourage policy makers not only to distinguish the circumstances faced by older women and men but also to target policies to meet their varied needs.

Third, despite certain social and economic vulnerabilities among the current generation of older Arabs, the findings in this chapter reveal that some improvements can be expected. Namely, rates of ever schooling and schooling attainment have increased dramatically for younger women and men and in some (but not all) Arab countries, the gains for women have outpaced those of men. As a result, gender gaps in selected human resources should be smaller or non-existent in some future generations of older Arabs. An important potential "payoff" for these investments could be more and better paid work across the life courses of future elders, which could create more leisure time after the

official age of retirement. However, the actual results of improvements in schooling are of course uncertain and may be gendered, especially if domestic labor and childcare remain the domain of Arab women.

Finally, this chapter reveals important avenues for future research on older Arabs. The Arab region remains the only one worldwide in which longitudinal, comparative research has not been undertaken. Such studies are needed to understand the trajectories and determinants of well-being in later life. Also, given the uncertain meaning of using reported measures of health in research on older adults, an accurate profile of the health status of older Arabs will require the objective measurement of salient health conditions in these longitudinal studies. Thus, the needs for research and policy on older Arabs follow from impending demographic and epidemiologic trends in the region. Hopefully, researchers and policymakers will apply the lessons learned from other regions as this agenda unfolds.

References

- Abdella N, Al Arouj M, Al Nakhi A, Al Assoussi A, Moussa M (1998) Non-insulin-dependent diabetes in Kuwait: Prevalence rates and associated risk factors. *Diabetes Res Clin Pract* 42:87–196
- Abolfotouh MA, Daffallah AA, Khan MY, Khattab MS, Abdulmoneim I (2001a) Central obesity in elderly individuals in south-western Saudi Arabia: Prevalence and associated morbidity. *East Mediterr Health J* 7(4/5):716–724
- Abolfotouh MA, Daffallah AA, Khan MY, Khattab MS, Abdulmoneim I (2001b) Psychosocial assessment of geriatric subjects in Abha City, Saudi Arabia. *East Mediterr Health J* 7(3):481–491
- Aghajanian A (1985) Living arrangements of widows in Shiraz, Iran. *J Marriage Fam* 47(3):781–784
- Ajlouni K, Jaddou H, Batiha A (1998) Obesity in Jordan. *Int J Obes Relat Metab Disord* 22:24–628
- Al Asfour DH, Al Lawati JA, Mohammed AJ (1999) Body fat distribution and the risk of non-insulin-dependent diabetes mellitus in the Omani population. *East Mediterr Health J* 5(1):14–20
- Al-Mahroos F, McKeigue PM (1998) High prevalence of diabetes in Bahrainis. Associations with ethnicity and raised plasma cholesterol. *Diabetes Care* 21:936–942
- Al-Nozha MM, Al-Maatouq MA, Al-Mazrou YY, Al-Harth SS, Arafah MR, halil MZ et al (2004) Diabetes mellitus in Saudi Arabia. *Saudi Med J* 25(11):1603–1610
- Al-Nuaim AR, Kremli M, Al-Nuaim M, Sandgki S (1995) Incidence of proximal femur fracture in an urbanized community in Saudi Arabia. *Calcif Tissue Int* 56:536–538

- Aloui T, Ayad M, Fourati H (1989) *Enquête Démographique et de Santé en Tunisie*. Columbia, Maryland [USA]: Office National de la Famille et de la Population, Direction de la Population, Tunis Tunisie et Institute for Resource Development/Macro Systems, Inc
- Al-Riyami, AA, Afifi M (2004) Smoking in Oman: Prevalence and characteristics of smokers. *East Mediterr Health J* 10(4/5):600–609
- Al-Sanabary N (1985) Continuity and change in women's education in the Arab States. Women and the family in the Middle East: New voices of change. University of Texas Press, Fernea EW, Austin, TX, pp 93–110
- Al-Shammari SA, Al-Subaie A (1999) Prevalence and correlates of depression among Saudi elderly. *Int J Geriatr Psychiatry* 14:739–747
- Al-Shammari SA, Al Mazrou Y, Jarallah JS, Al Ansary L, El-Shabrawy AM, Bamgboye EA (2000) Appraisal of clinical, psychological, and environmental health of elderly in Saudi Arabia: A household survey. *Int J Aging Human Dev* 50(1):43–60
- Al-Thakeb FT (1985) The Arab family and modernity: Evidence from Kuwait. *Curr Anthropol* 26(5):575–580
- Altorki S (1986) *Women in Saudi Arabia: Ideology and behavior among the elite*. Columbia University Press, New York
- Andrews G (1998) World Health Organization collaborative study on social and health aspects of aging in Bahrain, Egypt, Jordan, and Tunisia, 1991 [computer file]. ICPSR version. Alexandria, Egypt: WHO, EMRO [producer], 1993. Ann Arbor MI: ICPSR [distributor]
- An-Na'im AA (2002) *Islamic family law in a changing world: A global resource book*. Zed Books, London
- Arab Republic of Egypt, Ministry of Education (2003) *The National Plan for Education for All (2002/2003–2015/2016)*. Cairo: Ministry of Education
- Atallah R, Nehme C, Seoud J, Yerezian J, Zablit C, Levesque L et al (2005) [Caregivers of elderly people with loss of autonomy in Lebanon: What is the context of their health care?], *Recherches des Soins infirmiers* 81:122–138
- Aykan H, Wolf DA (2000) Traditionality, modernity, and household composition: Parent-child co-residence in contemporary Turkey. *Res Aging* 22(4):395–422
- Aytac IA (1998) Intergenerational living arrangements in Turkey. *J Cross Cult Gerontol* 13:241–264
- Azelmat M, Ayad M, Housnin E (1993) *Enquête Nationale sur la Population et la Santé (ENPS-II) 1992*. Columbia, Maryland [USA]: Ministère de la Santé Publique, Secrétariat Générale – DPSI, Service des Etudes et de l'Information Sanitaire [Rabat Maroc] et Macro International, Inc
- Azelmat M, Ayad M, Belhashmi H (1989) *Enquête Nationale sur la Planification Familiale, la Fécondité, and la Santé de la Population au Maroc (ENPS-II) 1992*. Columbia, Maryland [USA]: Ministère de la Santé Publique, Secrétariat Générale – DPSI, Service des Etudes et de l'Information Sanitaire [Rabat Maroc] et Macro International, Inc
- Baddoura R, Okais J, Awada H (2001) [Incidence of fractures after the age of 50 years in the Lebanese population and implications in terms of osteoporosis]. *Revue d'Epidemiologie et de Santé Publique* 49(1):27–32
- Barakat H (1988) The Arab family and the challenge of social transformation. In: Elizabeth A Fernea (ed) *Women and the Family in the Middle East*. Austin. University of Texas Press, pp 27–48
- Baron-Epel O, Haviv-Messika A (2004) Factors associated with age of smoking initiation in adult populations from different ethnic backgrounds. *Eur J Public Health* 14(3):301–305
- Beales S (2000) Why we should invest in older women and men: The experience of helpage international. *Gen Dev* 8(2):9–18
- Benavot A, Riddle P (1988) The expansion of primary education: 1870–1940: Trends and issues. *Soc Educ* 61(3):191–210
- Bener A, Al-Suwaidi J, Al-Jaber K, Al-Marri S, Elbagi IEA (2004) Epidemiology of hypertension and its associated risk factors in the Qatari population. *J Hum Hypertens* 18:529–530
- Bittles AH (1994) The role and significance of consanguinity as a demographic variable. *Popul Dev Rev* 20(3):561–584
- Boggatz T, Dassen T (2005) Ageing, care dependency, and care for older people in Egypt: A review of the literature. *Int J Older People Nurs Assoc with J Clin Nurs* 14(8b):56–63
- Bouguerra RH, Alberti H, Salem LB, Rayana CB, Atti JE, Gaigi S et al (2007) The global diabetes pandemic: The Tunisian experience. *Eur J Clin Nutr* 61(2):160–165
- Brink JH (1987) Changing extended family relationships in an Egyptian village. *Urb Anthropol* 16(2):133–149
- Burnham G, Lafta R, Doocy S, Roberts L (2006) Mortality after the 2003 invasion of Iraq: A cross-sectional cluster sample survey. *Lancet* 368:1421–1428
- Caldwell JC (1986) Routes to low mortality in poor countries. *Popul Development Rev* 12(2):171–220
- Casey B, Yamada A (2002) Getting older, getting poorer? A study of the earnings, pensions, assets, and living arrangements of older people in nine countries. *Labour Market and Social Policy Occasional Papers*, No 60. DEELSA/ELSE/WD (2002) 4. Paris: OECD
- Centers for Disease Control and Prevention (CDC) (2006a) *Assessing risk factors for chronic disease — Jordan, 2004*. *Morb Mortal Wkly Rep* 55 (23):653–655
- Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (2006b) *Health, United States 2006*. Retrieved December 10, 2006 from: <http://www.cdc.gov/nchs/data/hus/hus06.pdf>
- Central Statistical Organization (CSO) [Yemen] and Pan Arab Project for Child Development (PAPCHILD) [Egypt], and Macro International, Inc (MI) (1994) *Yemen Demographic and Maternal and Child Health Survey 1991/1992*. Calverton, Maryland: CSO and MI
- Chaaya M, Sibai AM, El-Chemaly S (2006) Smoking patterns and predictors of smoking cessation in elderly populations in Lebanon. *Int J Tuberc Lung Dis* 10(8):917–923
- Chahine LM, Bijlsma A, Hospers APN, Chemali Z (2006) Dementia and depression among nursing home residents in Lebanon: A pilot study. *Int J of Geriatr Psychiatry*. Epub ahead of print <http://www3.interscience.wiley.com/cgi-bin/abstract/112784230/ABSTRACT?CRETRY=1&SRETRY=0>
- Charrad MM (2001) *States and women's rights: The making of postcolonial Tunisia, Algeria, and Morocco*. University of California Press, Berkeley
- Chemali Z, Chahine LM, Sibai AM (2008) Prospects of older adult care in Lebanon: Towards stronger and sustainable reforms. *East Mediterr Health J* 14:1466–1476

- Cliggett L (2001) Survival strategies of the elderly in Gwembe valley, Zambia: Gender, residence and kin networks. *J Cross Cultl Gerontol* 16(4):309–332
- Craig JE (1981) The expansion of education. *Rev Res Educ* 9:151–210
- Department of Statistics [DOS] and Macro International, Inc [MI] (1998) Jordan Population and Family Health Survey 1997. Calverton, Maryland, USA: DOC and MI
- Department of Statistics [Jordan] and ORC Macro (2003) Jordan Population and Family Health Survey 2002. Calverton, Maryland, USA: Department of Statistics and ORC Macro
- Economic and social commission for Western Asia (2002) Women and men in the Arab countries: Employment. Retrieved December 27, 2006, from <http://css.escwa.org.lb/scu-countryreports/EmploymentEN.pdf>
- Elattar I (2005) Cancer in the Arab World: Magnitude of the problem. Retrieved November 15, 2006, from http://www.nci.edu.eg/lectures/cancer_problem/Cancer%20in%20the%20Arab%20World%20IICC%20Mar24-05.pdf
- Eldemire D (1997) The Jamaican elderly: A socio-economic perspective and policy implications. *Soc Econ Stud* 46(1):75–93
- El-Desouki MI (2003) Osteoporosis in postmenopausal Saudi women using dual x-ray bone densitometry. *Saudi Med J* 24(9):953–956
- El-Maghraoui A, Koumba BA, Jroundi I, Achemlal L, Bezza A, Tazi MA (2005) Epidemiology of hip fractures in 2002 in Rabat, Morocco. *Osteoporos Int* 16:597–602
- El-Shazly M, Makkboul G, El-Sayed A (2004) Life expectancy and cause of death in the Kuwaiti population 1987–2000. *East Mediterr Health J* 10 (1/2):45–55
- El-Zanaty F, Way AA (2001) Egypt Demographic and Health Survey 2000. Calverton, Maryland [USA]: Ministry of Health and Population [Egypt], National Population Council, and ORC Macro
- El-Zanaty F, Way AA (2004) 2003 Egypt Interim Demographic and Health Survey. Cairo, Egypt: Ministry of Health and Population [Egypt], National Population Council, El-Zanaty and Associates, and ORC Macro
- El-Zanaty F, Way AA (2006) Egypt Demographic and Health Survey 2005. Cairo, Egypt: Ministry of Health and Population, National Population Council, El-Zanaty and Associates, and ORC Macro
- El-Zanaty FH, Sayed H, Zaky H, Way AA (1993) Egypt Demographic and Health Survey 1992. Calverton, Maryland [USA]: National Population Council [Egypt] and Macro International, Inc
- El-Zanaty F, Hussein EM, Shawky GA, Way AA, Kishor S (1996) Egypt Demographic and Health Survey 1995. Calverton, Maryland [USA]: National Population Council [Egypt] and Macro International, Inc
- Ezzati M, Lopez AD, Rodgers A, Vander Hoorn S, Murray CJ (2002) Selected major risk factors and global and regional burden of disease. *Lancet* 360:1347–1360
- Farrag A, Farwiz HM, Khedr EH, Mahfouz RM (1998) Prevalence of Alzheimer's disease and other dementing disorders: Assiut-Upper Egypt study. *Dement Geriatr Cogn Disord* 9(6):323–328
- Friedman J, Knodel J, Cuong BT, Ahn TS (2003) Gender dimensions of support for elderly in Vietnam. *Res Aging* 25(6):587–630
- Ghannem H, Hadj Fredj A (1997) Epidemiology of hypertension and other cardiovascular disease risk factors in the urban population of Soussa, Tunisia. *East Mediterr Health J* 3(3):472–479
- Ghubash R, El-Rufaie O, Zoubeidi T, Al-Shboul QM, Sabri SM (2004) Profile of mental disorders among the elderly United Arab Emirates population: Sociodemographic correlates. *Int J Geriatr Psychiatry* 19:344–351
- Gibson D (1996) Broken down by age and gender – the problem of old women redefined. *Gender Society* 10(4):433–448
- Globocan (2002) Retrieved November 15, 2006 from: <http://www-dep.iarc.fr/>
- Global Youth Tobacco Surveillance Group (2003) Differences in worldwide tobacco use by gender: Findings from the global youth tobacco survey. *J Sch Health* 73(6):207–215
- Grau MAG (2002) Residence patterns of aged widows in three Mediterranean communities and the organization of care. *Hist Fam* 7(1):157–173
- Hafez G, Bagchi K, Mahaini R (2000) Caring for the elderly: A report on the status of care for the elderly in the Eastern Mediterranean Region. *East Mediterr Health J* 6(4):636–643
- Hagestad GO (1986) The family: Women and grandparents as kinkeepers. In: Pifer A, Bronte L (eds) *Our aging society: Paradox and promise*. WW Norton and Company Inc., New York, pp 141–160
- Hamadeh RR (2000) Non communicable disease among the Bahraini population: A review. *East Mediterr Health J* 6(5/6):1091–1097
- Hammoudeh M, Al-Khayarin MZ, Bener A (2005) Bone density measured by dual energy X-ray absorptiometry in Qatari women. *Maturitas* 52:19–327
- Hancioglu A (1985) Türkiye'de Aile Bicimleri ve Aile Büyüklüğü [Family types and Household Size in Turkey] in 1978. Unpublished master's thesis, Hacettepe Institute of Population Studies, Ministry of Health, and Macro International Inc
- Harzallah F, Alberti H, Ben Khalifa F (2005) The metabolic syndrome in an Arab population: A first look at the new international diabetes federation criteria. *Diabetic Med* 23:41–444
- Hatch LR (2000) Beyond Gender Differences: Adaptation to aging in life course perspective. Baywood Publishing Company, Amityville NY
- Hill K, Upchurch DM (1995) Gender differences in child health: Evidence from the demographic and health surveys. *Popul Dev Rev* 21(1):127–151
- Holmes-Eber P (1997) Migration, urbanization, and women's kin networks in Tunis. *J Comp Fam Stud* 28(2):54–72
- Hoodfar H (1997) Between marriage and the market: Intimate politics and survival in Cairo. University of California Press, Berkeley
- Hooyman NR (1999) Untapped resources: Women in ageing societies across Asia. *Gerontol* 39(1):115–118
- Iacovou M (2002) Sharing and caring: Older European's living arrangements. *Schmollers Jahrbuch* 122:11–142
- Ibrahim MM, Rizk H, Appel LJ, El Aroussy W, Helmy S, Sharaf Y, et al NHP Investigative Team (1995) Hypertension prevalence, awareness, treatment, and control in Egypt: Results from the Egyptian National Hypertension Project (NHP). *Hypertension* 26:86–890
- Jackson RT, Al Mousa Z, Al-Raqua M, Prakash P, Muhanna A (2001) Prevalence of coronary risk factors in healthy adult Kuwaitis. *Int J Food Sci Nutr* 52:301–311

- Jaddou HY, Bateiha AM, Ajlouni KM (2000) Prevalence, awareness and management of hypertension in a recently urbanised community, eastern Jordan. *J Hum Hypertens* 14(8):497–501
- Jarallah J, Al-Rubeaan, K Al-Nuaim, A, Al-Ruhaily A, Kalantan K (1999) Prevalence and determinants of smoking in three regions of Saudi Arabia. *Tob Control* 8:53–56
- Kabeer N (1999) Resources, agency, achievements: reflections on the measurement of women's empowerment. *Dev Change* 30:35–64
- Kadiki OA, Roaed RB (1999) Epidemiological and clinical patterns of diabetes mellitus in Benghazi, Libyan Arab Jamahiriya. *East Mediterr Health J* 5(1):6–13
- Kadiki OA, Roaid RB (2001) Prevalence of diabetes mellitus and impaired glucose tolerance in Benghazi Libya. *Diabetes Metab* 27:47–654
- Kalantan KA, Mohamed AG, Al-Taweel AA, AbdulGhani HM (2001) Hypertension among attendants of primary health care centers in Al-Qassim region, Saudi Arabia. *Saudi Med J* 22 (11):960–963
- Kamo Y, Zhou M (1994) Living arrangements of elderly Chinese and Japanese in the United States. *J Marriage Fam* 56(3):544–558
- Kandela P (1999) The Kuwaiti passion for food cannot be shaken. *Lancet* 353:1249–1250
- Kandiyoti D (1988) Bargaining with patriarchy. *Gender and Society* 2(3):274–90
- Kannel, WB (2002) Coronary heart disease risk factors in the elderly. *Am J Geriatr Cardiol* 11(2):101–107
- Keller I, Makipaa A, Kalensher T, Kalache A (2002) Global survey on geriatrics in the medical curriculum, Geneva: World Health Organization. Retrieved April 15, 2006, from: http://www.who.int/ageing/publications/alc_tegeme_survey.pdf
- Khadr ZA (1997) Living arrangements and social support systems of the older population in Egypt. Unpublished doctoral dissertation, University of Michigan, Ann Arbor, Michigan
- Khadr Z, Yount KM (nd). Differences in self-reported disability among older women and men in Ismailia, Egypt
- Khoury SA, Massad D, Fardous T (1999) Mortality and causes of death in Jordan 1995–1996: Assessment by verbal autopsy. *Bull World Health Organ* 77(8):641–650
- Kim IK, Choe EH (1992) Support exchange patterns of the elderly in the republic of Korea. *Asia-Pac Pop J* 7(3):89–104
- Kingdom of Bahrain, Ministry of Health (2002) National nutrition survey for adult Bahrainis aged 19 years and above. Bahrain: Ministry of Health
- Knodel J, Ofstedal MB (2003) Gender and aging in the developing world: Where are the men? *Popul Dev Rev* 29(4):677–698
- Lamb VL (1997) Gender differences in correlates of disablement among the elderly in Egypt. *Soc Sci Med* 45(1):127–136
- Laouani KC, Hmouda H, Ben Naceur MH, Ghannem H, Toumi S, Ajmi F (2004) High blood pressure for people aged more than 60 years in the district of Sousse. *Tunisie Medicale* 82(11):1001–1005
- Lee GR, Dwyer JW (1996) Age parent-adult child co-residence. *J Fam Issues* 17(1):46–59
- Lee, Y, Parish, WL, Willis RJ (1994) Sons, daughters, and inter-generational support in Taiwan. *Am J Soc* 99(4):1010–1041
- Lee, YJ Palloni A (1992) Changes in the family status of elderly women in Korea. *Demography* 29(1):69–92
- Liang J, Gu S, Krause N (1992) Social support among the aged in Wuhan, China. *Asia-Pac Pop J* 7(3):33–62
- Litwin H (2006) The path to well-being among elderly Arab Israelis. *J Cross Cult Gerontol* Epub at <http://www.springerlink.com.proxy.library.emory.edu/content/a8441712m17wv638/fulltext.pdf>
- Lopata H (2002) Widower, widow: How same? How different? *The Gerontologist* 42(4):564–566
- Lye, DN (1996) Adult child-parent relationships. *Annual Rev Soc* 22:79–102
- Malik M et al (2003) Glucose intolerance and associated factors in the multi/ethnic population of the United Arab Emirates: results of a national survey, 2003. Retrieved November 24, 2006, from: www.emro.who.int/ncd/SURF/EMRO/UAE.pdf
- Malik M, Bakir A, Saab BA, Roglic G King H (2005) Glucose intolerance and associated factors in the multi-ethnic population of the United Arab Emirates: Results of a national survey. *Diabetes Res Clin Pract* 69(2):188–195
- Margolis SA, Reed RL (2001) Institutionalizing older adults in a health district in the United Arab Emirates: Health status and utilization rate. *Gerontology* 47(3):161–167
- Margolis SA, Carter T, Dunn EV, Reed RL (2003) The health status of community based elderly in the United Arab Emirates. *Arch Gerontol Geriatr* 37:1–12
- Martin LG, Tsuya NO (1991) Interactions of middle-aged Japanese with their parents. *Popul Stud* 45(2):299–311
- Mason KO (1992) Family change and support of the elderly in Asia: What do we know? The problem of care for the elderly is likely to be especially acute for women. *Asia-Pac Pop J* 7:3–32
- Maziak W, Ward KD, Afifi Soweid RA, Eissenberg T (2004) Tobacco smoking using a waterpipe: A re-emerging strain in a global epidemic. *Tob Control* 13:327–333
- McMullin J (1995) Theorizing age and gender relations. In: Arber S, Ginn J (eds) *Connecting gender and ageing: A sociological approach*. Open University Press, Bristol PA, pp 173–990
- Mernissi F (1987) *Beyond the veil*. Indiana University Press
- Ministère de la Santé [Maroc], ORC Macro, et Ligue des États Arabes (2005) *Enquête sur la Population et la Santé Familiale (EPSF) 2003–2004*. Calverton, Maryland [USA]: Ministère de la Santé [Maroc] et ORC Macro
- Ministry of Health [United Arab Emirates] (2003) *National Family Health Study, 2003*. United Arab Emirates: Ministry of Health
- Morgan SP, Hirosima K (1983) The persistence of extended family residence in Japan: Anachronism or alternative strategy. *Am Soc Rev* 48(2):269–281
- Morsy SA (1993) *Gender, sickness, and healing in rural Egypt*. Westview Press, Boulder
- Morsy SA (1978) Sex differences and folk illness in an Egyptian village. In: Lois Beck, Nikki Keddie (eds) *Women in the muslim world*. Harvard University Press
- Musaiger AO (1992) Diabetes mellitus in Bahrain: An overview. *Diabet Med* 9(6):574–578
- Musaiger AO (2004a) Overweight and obesity in the Eastern Mediterranean region: Can we control it? *East Mediterr Health J* 10(6):789–793
- Musaiger AO (2004b) Health status, lifestyle and nutrient intake of home resident elderly in Bahrain. *Nutr Health* 17(4):285–295

- Musaiger AO, Al-Mannal MA (2001) Weight, height, body mass index and prevalence of obesity among the adult population in Bahrain. *Ann Hum Biol* 28(3):346–350
- Nagi SZ (1976) An epidemiology of disability among adults in the United States. The Milbank Memorial Fund quarterly. *Health and Society* 54(4):439–467
- Nassar H (2003) The Economics of tobacco in Egypt: a new analysis of demand. Retrieved February 20, 2007 from <http://www.emro.who.int/tfi/TobaccoEconomics-Egypt.pdf>
- Nawar L, Lloyd CB, Ibrahim B (1995) Women's autonomy and gender roles in Egyptian families. Family, gender, and population in the Middle East: Policies in context edited by Carla Makhlouf Obermeyer, The American University in Cairo Press, pp 147–178
- Nazarchuk SA (2001) The care and cost of elderly in long-term care facilities in the United States. Unpublished doctoral dissertation, State University of New York, Binghamton
- Obermeyer CM (1992) Islam, women, and politics: The demography of Arab countries. *Popul Dev Rev* 18(1):33–60
- Ofstedal MB, Knodel J, Chayovan N (1999) Intergenerational support and gender: A Comparison of four Asian countries. *Southeast Asian J Soc Sci* 27(2):21–42
- Ogawa N, Retherford RD (1997) Shifting costs for caring for the elderly back to families in Japan: Will it work? *Popul Dev Rev* 23(1):59–94
- Risseuw C (2001) Policy issues of inclusion and exclusion in relation to gender and ageing in the south. *Eur J Dev Res* 13(2):6–48
- Roan CL, Raley RK (1996) Intergenerational co residence and contact: a longitudinal analysis of adult children's response to their mother's widowhood. *J Marriage Fam* 58:08–717
- Rossi AS, Rossi PH (1990) Of human bonding: Parent-child relations across the life course. Aldine de Gruyter, Hawthorne NY
- Rugh AB (1981) Orphanages and homes for the aged in Egypt: Contradiction or affirmation in a family oriented society. *Int J Soc Fam* 11(2):203–233
- Rugh AB (1984) Family in Contemporary Egypt. Syracuse University Press
- Sadat-Ali M, Al-Habdan IM, Al-Mulhim FA, El-Hassan A (2004) Bone mineral density among postmenopausal Saudi women. *Saudi Med J* 25(11):623–1625
- Saeed WAA, Al Shammary FJ, Khoja TA, Hashim TJ, Anokute CC, Khan SB (1996) Prevalence of hypertension and sociodemographic characteristics of adult hypertensives in Riyadh City, Saudi Arabia. *J Hum Hypert* 10:583–587
- Salti I, Khogali M, Alam S, Abu Haidar N, Masri A (1997) Epidemiology of diabetes mellitus in relation to other cardiovascular risk factors in Lebanon. *East Mediterr Health J* 3(3):462–471
- Sayed HAA, Osman MI, El-Zanaty FH, Way AA (1989) Egypt Demographic and Health Survey 1988. Columbia, Maryland [USA]: National Population Council [Egypt] and Institute for Resource Development/Macro Systems, Inc
- Seikaly M (1994) Women and social change in Bahrain. *Int J Middle East Stud* 26:415–426
- Shah NM, Al-Rahmani E, Behbehani J, Shah MA, Radovanovic Z (2000) Final Report of Project on Trends, Patterns, and Predictors of Fertility in Kuwaiti Women. KFAS Project number 96–07–15
- Shah NM, Shah MA, Behbehani J, Al-Obaidi S, Badr H, Yount KM, Agree EM (2003) Psychosocial health status, disability, and networks of social support among older Kuwaiti men and women. Funded by the Kuwait Foundation for the Advancement of Sciences
- Shah NM, Shah MA, Radovanovic Z (1998) Towards defining socioeconomic and demographic inequalities that may affect health in Kuwait. *Med Prin Pract* 7:31–46
- Shah N, Yount KM, Shah MA, Menon I (2002) Living arrangements of older women and men in Kuwait. *J Cross Cult Gerontol* 17:37–55
- Shamseddine A, Sibai AM, Gehchan N, Rahal B, El-Saghir N, Ghosn M, for the Lebanese Cancer epidemiology group (2004) Cancer incidence in postwar Lebanon: Findings from the first national population-based registry, 1998. *Ann Epidemiol* 14:663–668
- Shilbayeh S (2003) Prevalence of osteoporosis and its reproductive risk factors among Jordanian women: A cross-sectional study. *Osteoporos Int* 14:929–940
- Sibai AM, Chaaya M (2006) The urban health study: Background and design (Older Adult Component) American University of Beirut, Faculty of Health Sciences, CRPH: (http://staff.aub.edu.lb/~webcrph/projects/pdfs/UHS_Background_Design_0106.pdf)
- Sibai AM, Fletcher A, Hills M, Campbell O (2001) Non-communicable disease mortality rates using the verbal autopsy in a cohort of middle aged and older populations in Beirut during wartime, 1983–93. *J Epidemiol Community Health* 55:271–276
- Sibai AM, Hwalla N, Adra N, Rahal B (2003a) Prevalence and covariates of obesity in Lebanon: Findings from the first epidemiological study. *Obes Res* 11(11):1353–1361
- Sibai AM, Yount KM, Fletcher A (2007) Marital status and living arrangements as predictors of mortality among middle-aged and older men and women during wartime in Beirut: Gains and liabilities. *Soc Sci Med* 64(1):64–76
- Sibai AM, Zard C, Adra N, Baydoun M, Hwalla N (2003b) Variation in nutritional status of elderly men and women according to place of residence. *Gerontology* 49:215–224
- Singerman D, Ibrahim B (2001) The cost of marriage in Egypt: A hidden dimension in the new Arab family. *Cairo Papers in Social Science* 24:80–116
- Sinunu MA, Yount KM, El-Afify, NAW (2008) Informal and formal long-term care for frail older adults in Cairo. *Egypt J Cross Cult Gerontol*, E-pub ahead of print
- Sobieszczyk T, Knodel J, Chayovan N (2003) Gender and well-being among older people: Evidence from Thailand. *Ageing and Society* 23:701–735
- Spitze, G Logan, JR (1989) Gender differences in family support: Is there a payoff? *Gerontologist* 29:108–113
- Stevenson TB (1997) Migration, family, and household in Highland Yemen: The impact of socio-economic and political change and cultural ideals on domestic organization. *J Comp Fam Stud* 28(2):14–53
- Tamim H, Terro A, Kassem H, Ghazi A, Khamis TA, Hay MM, et al (2003) Tobacco use by university students, Lebanon 2001. *Addiction* 98(7):933–939
- Tazi MA, Khalil SA, Chaouki N, Cherquaoui S, Lahmouz F, Srairi JE, et al (2003) Prevalence of the main cardiovascular risk factors in Morocco: Results of a national survey, 2000. *J Hypertens* 21:897–903

- Tohme RA, Jurjus AR, Estephan A (2005) The prevalence of hypertension and its association with other cardiovascular disease risk factors in a representative sample of the Lebanese population. *J Hum Hypertens* 19:861–868
- UNFPA and Ministry of Social Affairs (1996) Population and Housing Survey. Beirut: Ministry of Social Affairs [raw data on CD-ROM]
- U.S. Social Security Administration (2006) Social security programs throughout the world. Retrieved December 21, 2006, from <http://www.ssa.gov/policy/docs/progdesc/ssptw/index.html>
- United Nations Development Programme [UNDP] (2002) Arab Human Development Report, 2002. New York, NY: United Nations Publications
- United Nations Population Division (2005) World Population Prospects: The 2004 Revision Population Database. [Online] Retrieved September, 2006 from <http://esa.un.org/unpp/index.asp?panel=2>
- United Nations, Department of Economic and Social Affairs, Population Division (2006) World Population Prospects: The 2004 Revision and World Urbanization Prospects: The 2003 Revision. Retrieved December 27, 2006, from <http://esa.un.org/unpp>
- United Nations, Department of Economic and Social Affairs, Population Division (2005) Living arrangements of older persons around the world. New York: United Nations
- Van Velsor E, O’Rand A (1984) Family lifecycle, work career patterns, and women’s wages at midlife. *J Marriage Fam* 46(2):365–373
- Warsy AS, El-Hazmi MAF (1999) Diabetes mellitus, hypertension and obesity-common multifactorial disorders in Saudis. *East Mediterr Health J*, 5(6):1236–1242
- Westoff C (2003) Trends in marriage and early childbearing in developing countries. DHS Comparative Reports 5. Calverton, MD: ORC Macro
- Winckler O (2005) Arab political demography: Volume one: population growth and natalist policies. Brighton: Sussex Academic Press
- Wolf M (1972) Women and the family in rural Taiwan. Stanford: Stanford University Press
- World Bank Group (2002) Genderstats: Database of gender statistics. Retrieved December, 2006, from <http://genderstats.worldbank.org/home.asp>
- World Health Organization (1979) Controlling the smoking epidemic. Technical report series, no. 636. Geneva: World Health Organization
- World Health Organization (1996) Guidelines for controlling and monitoring the tobacco epidemic. Geneva: World Health Organization
- World Health Organization (2002) The World Health Report 2002. Retrieved October, 2006, from http://www.who.int/whr/2002/en/whr02_en.pdf
- World Health Organization (2006) World Health Statistics 2006. Geneva: World Health Organization
- Yount KM (1999) Persistent inequalities: women’s status and differentials in the treatment of sick boys and girls: Case study of Minia, Egypt. Unpublished doctoral dissertation, Johns Hopkins University, Baltimore, Maryland
- Yount KM (2004) Maternal resources, proximity of services, and the curative care of boys and girls in Minya, Egypt. *Popul Stud* 58(3):345–355
- Yount KM (2005a) Resources, family organization, and violence against married women in Minia, Egypt. *J Marriage Fam* 67(3):579–596
- Yount KM (2005b) The patriarchal bargain and intergenerational co residence in Egypt. *The Sociological Quarterly* 46:139–166
- Yount KM (Forthcoming) The living arrangements of older women and men in Egypt and Tunisia. *Popul Res Policy Rev*
- Yount KM (2008) Gender, resources across the life course, and cognitive functioning in Egypt. *Demography* 45(4):907–926
- Yount KM, Agree EM (2005) Differences in disability among older women and men in Egypt and Tunisia. *Demography* 42(1):169–187
- Yount KM, Agree EM, Khadr Z (2003) Measurement of gender differences in health and care (1R03AG021707-01) Funded by the National Institute on Aging
- Yount KM, Khadr Z (2005) A biosocial model of medication use among older women and men in Ismailia, Egypt. *J Biosoc Sci* 3:77–603
- Yount KM, Khadr Z (2008) Gender, social change, and living arrangements among older Egyptians during the 1990s. *Popul Res Pol Rev* 27(1):201–205
- Youssef RM (2005) Comprehensive health assessment of senior citizens in Al-Karak governorate, Jordan. *East Mediterr Health J* 11(3):334–348
- Zeki Al Hazzouri, AG (2006) Gender differences in reported physical disability among older adults in three underprivileged communities in the suburbs of Beirut. Unpublished Master’s Thesis, American University of Beirut, Lebanon
- Zou’bi AAA, Poedjastoeti Ayad, M (1992) Jordan population and family health survey 1990. Columbia, Maryland, USA: Department of Statistics [Jordan] and IRD/Macro International, Inc

Appendix 1 Eligible Sample of Adults Aged 50 Years and Older, and Sample with Complete Data on Variables of Interest

	Eligible Sample			Analytic Sample			Response Rate (Per cent)			Variables of Interest
	Men	Women	Total	Men	Women	Total	Men	Women	Total	
Total	85768	86395	166320	85254	85653	163103	99.1	99.4	-	
Egypt										
1988 ^a	3490	3499	6989	3390	3442	6832	98.4	97.1	97.8	Female, marital status, schooling, literacy, work
1992 ^b	3626	3736	7362	3595	3695	7290	98.9	99.1	99.0	Gender, marital status, schooling, work
1995 ^c	5122	5124	10246	5118	5119	10237	99.9	99.9	99.9	Gender, marital status, schooling, work
2000 ^d	5181	5800	10982	5179	5795	10974	99.9	100.0	99.9	Gender, marital status, schooling, work
2003 ^e	3353	3466	6819	3351	3461	6812	99.9	99.9	99.9	Gender, marital status, schooling
2005 ^f	7413	7517	14930	7273	7487	14760	99.6	98.1	98.9	Gender, marital status, schooling
Jordan										
1990 ^g	2817	2607	5424	2815	2596	5411	99.6	99.9	99.8	Gender, marital status, schooling, work
1997 ^h	2350	2295	4645	2339	2286	4625	99.6	99.5	99.6	Gender, marital status, schooling
2002 ⁱ	2370	2420	4790	2370	2420	4790	100.0	100.0	100.0	
Lebanon										
1996 ^j	26271	25195	51466	26271	25195	51466	100.0	100.0	100.0	Gender, marital status, schooling, work
Morocco										
1987 ^{k,l}	2814	3030	NA	2785	2711	NA	89.5	99.0	NA	Men: gender, marital status; Women: gender, marital status, schooling
1992 ^m	2682	2891	5573	2658	2845	5503	98.4	99.1	98.7	Gender, schooling
2003 ⁿ	4717	4869	9586	4690	4855	9545	99.7	99.4	99.6	Gender, marital status, schooling
Tunisia										
1988 ^{o,l}	2308	2275	4583	2308	2274	4582	100.0	100.0	100.0	Gender, marital status
Yemen										
1991 ^p	5157	4965	10122	5089	4844	9933	97.6	98.7	98.1	Gender, marital status, schooling

^a Sayed, Osman, El-Zanaty, & Way. (1989).

^b El-Zanaty, Sayed, Zaky, & Way. (1993).

^c El-Zanaty, Hussein, Shawky, Way, & Kishor. (1996).

^d El-Zanaty & Way. (2001).

^e El-Zanaty & Way. (2004).

^f El-Zanaty & Way. (2006).

^g Zou'bi & Poedjastoeti. (1992).

^h Department of Statistics [DOS] & Macro International, Inc [MI]. (1998).

ⁱ Department of Statistics [Jordan] and ORC Macro. (2003).

^j XXX (1996).

^k Azelmat, Ayad, & Belhashmi. (1989).

^l The question on schooling was asked only for women aged 15 years and older, so sample sizes and response rates are computed separately for women and men.

^m Azelmat, Ayad, & Housni. (1993).

ⁿ Ministère de la Santé [Maroc], ORC Macro, & Ligue des États Arabes. (2005).

^o Aloui, Ayad, & Fourati (1989).

^p Central Statistical Organization (CSO) [Yemen], Pan Arab Project for Child Development (PAPCHILD) [Egypt], & Macro International, Inc (MI). (1994).

Part III

Migration and Aging

Chapter 14

Geographic Mobility and Aging in Place

Don E. Bradley and Charles F. Longino*

Introduction

Because the popular press has had a long-term interest in the phenomenon of retirement migration, the small proportion of older persons who make long-distance moves has gotten a great deal of public attention. This state of affairs is unfortunate because mobility is richer and much more varied than the popular notion of it suggests and the explanations of mobility that have motivated research on this topic are complex and interesting.

In this chapter, the entire range of mobility in later life will be explored, including aging in place. We first describe rates of spatial mobility across the age span. Evidence from the United States and other countries is presented in a theoretical context that portrays industrial development as a key source of cross-national variation in the volume and character of later-life migration. Next, we show that later life migration is qualitatively different from labor force migration. Then the advantages of aging in place are examined; this is the overwhelming mobility choice of older Americans. From this point we review a variety of theoretical perspectives on later life mobility and aging in place (i.e., the migration decision model, the life course model, and the place identity model). In the section that follows we examine the impacts of later-life migration for receiving communities. This includes a discussion of migrant selectivity, the characteristics of migrants within flows and streams, and by implication, the economic, political, and social impact

of retirement migration on receiving communities. At this point the geographical patterns of later-life migration will be described, on both the state and county or county group level in the United States. As part of this description of patterns, brief attention is given to seasonal migration. Next we review evidence from longitudinal panel studies pertaining to the causes of residential mobility among elders. The final section of the chapter discusses the impact of migration on the health and well-being of older adults.

Rates of Later-Life Mobility

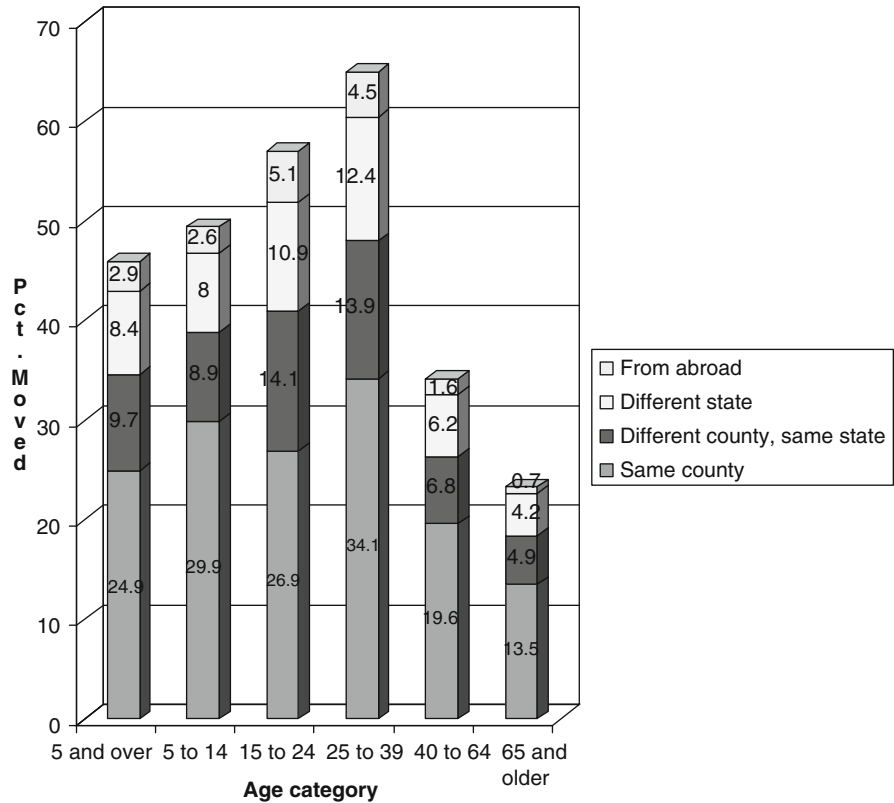
The United States

There is substantial variation in mobility patterns across age-groups. Estimates in Fig. 14.1 are based on data from the 2000 U.S. Census (adapted from Franklin 2003) and show that older adults have lower rates of geographic mobility than those for any other age category. This does not mean, however, that mobility is rare among elders. Of those 65 and older, an estimated 23 per cent had made some type of move within the five years preceding the 2000 census. Even so, young adults aged 25–39 were more than 2.5 times as likely to have moved during the same period, compared to those aged 65 and older. Declining mobility rates with age are

D. E. Bradley (✉)
Department of Sociology
East Carolina University
Greenville, NC, USA
E-mail: bradleyd@ecu.edu

* The second author died on Christmas Day, 2008. Chuck was an eminent scholar. He was also my constant friend and trusted mentor. I am deeply and forever indebted to Chuck and join a host of colleagues, former students, friends, and family in mourning his passing. Chuck was always genuinely happy to see me. I will miss his cheerful smile and unflinching optimism.
Don E. Bradley.

Fig. 14.1 Residential mobility and migration in the US across age categories, 1995–2000



Source: adapted from Franklin, 2003.

observed with respect to both local and long-distance moves. As compared to persons aged 25–39, persons 65 and older are about one-third as likely, and those aged 40–64 are about half as likely, to report an interstate move in the previous five years. It is worth pointing out that nearly 60 per cent of moves reported by those 65

and older were within the same county. Interstate migration is relatively uncommon. An estimated 4.2 per cent of those 65 and older in 2000 report having moved across state lines between 1995 and 2000.

A closer look at the impact of age on interstate migration is afforded in Fig. 14.2. Interstate migration

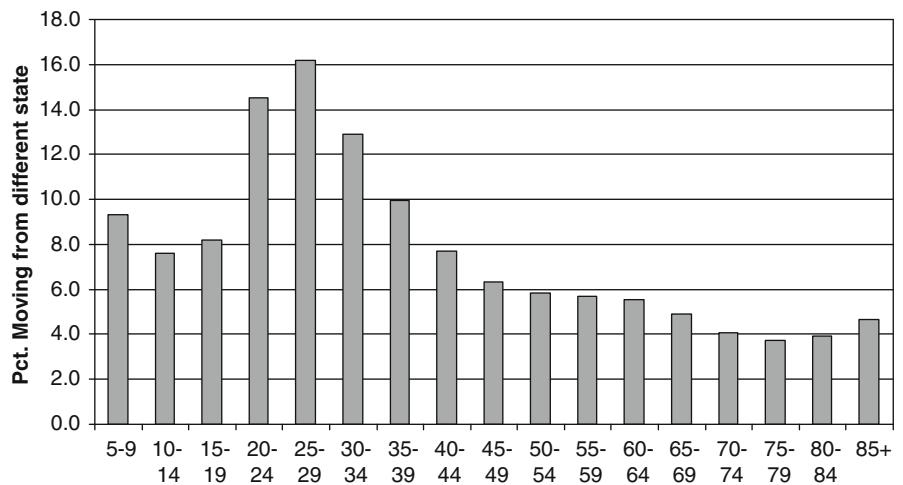


Fig. 14.2 Interstate migration in the US by five-year age category, 1995–2000

Source: 2000 US census, Five-Per cent Public Use Microdata Sample.

is the highest among those aged 25–29 at 16.2 per cent, but it declines across older age categories, reaches a low point among those aged 75–79, and then rebounds slightly in the oldest age category. Those 85 and older are more likely to report an interstate move than those aged 70–74, 75–79, or 80–84.

Industrial Development and Later-Life Migration

Because migration in later-life is obviously shaped by social context, we would expect substantial cross-national differences. In particular, industrialization may by various mechanisms impact not only the overall rate but also the character of later-life migration. A widely applied three-stage model (Law and Warnes 1982; Warnes and Law 1984) argues that rural-to-urban migration in the early phases of industrialization yields a cohort of first-generation urban dwellers with strong ties to their region of origin, setting up substantial urban-to-rural return migration flows upon retirement. In the second stage, elders living in urban zones have only weak ties to rural areas such that lifestyle preferences become increasingly influential and a limited number of amenity-rich retirement destinations emerge. These initial retirement destinations become overcrowded in the third phase, leading to an expansion in the number of favored retirement destinations.

The emergence of Law and Warnes (1982) second stage depends on the extent to which elders have the resources to complete lifestyle oriented moves toward areas offering scenic environs and recreational opportunities. King et al. (2000), delineate a number of changes associated with industrial development in the United Kingdom that have contributed to an increase over time in the number of seniors prepared to make a long-distance move. Though primarily concerned with international retirement migration, several of the arguments developed by King et al. (2000) apply equally well to long-distance internal migration, especially moves motivated by lifestyle considerations. In particular, declining labor force participation among older men combined with prolonged life expectancy means that individuals and couples in their fifties can reasonably anticipate a long retirement period in which to enjoy the benefits of a long-distance move. Improved education levels, moreover, mean that in the contem-

porary period those approaching retirement are likely to have expanded aspirations for their retirement years. These aspirations may generate a greater willingness to make a long-distance move in pursuit of an improved lifestyle. In addition, expansion of private and public pension programs has contributed to increases in income in later-life providing the means to finance a long-distance move.

At the same time, the rate of later-life migration within a given society should depend not only on the supply of potential movers but also the range of available destination opportunities. Industrial development is here again implicated. The extension of telecommunication, electrical, water, and sewage services to rural and outlying areas increase their attractiveness. Moreover, expanding transportation linkages to urban centers facilitate weekend and vacation visits to amenity rich areas, thus establishing connections that may pave the way for a move upon retirement (see King et al. 2000).

Historical and Cross-National Studies

Historical analyzes linking industrialization and later life migration within a given country are scarce. Allon-Smith (1982) traces shifts in the distribution of elders across counties in England and Wales between 1921 and 1971; amenity-rich retirement destinations (e.g., coastal areas) began to emerge during the 1930s and 1940s. However, Allon-Smith's (1982) analysis does not directly measure later-life migration or migration rates.

Evidence from U.S. Census data suggests that the rate of interstate migration among those 60 and older has been fairly stable since 1960, ranging from 3.9 per cent during the period 1965–1970 to 4.6 per cent for the periods 1975–1980 and 1995–2000 (Longino 2006). Yet, many of the most important industrialization-driven changes had been largely accomplished by 1955 (e.g., extended life expectancy). An examination of later-life migration rates beginning with the earliest phases of U.S. industrial development would of course be useful. However, Census data are not well-suited to this purpose; a residential mobility item was not included in the U.S. Census until 1940 (Longino 2006).

Cross-national variation in later-life internal migration has received only limited empirical attention.

Rogers (1988) analyzes previously reported age-specific migration rates for a number of more developed countries and finds notable regularities. Of special interest, Rogers (1988) finds that long-distance migration rates generally slope upward and peak at or near retirement age, while local moves become increasingly common in the oldest cohorts, likely reflecting the onset of widowhood and disability.

This “retirement peak” likely reflects retirement-triggered moves in pursuit of improved housing and a more agreeable climate (Serow 1988). But it is important to note that Rogers’ (1988) analysis failed to uncover clear evidence of a retirement peak in the age-specific migration rates for Japan. Rogers et al. (1990) specifically explore variability across industrialized nations comparing elder migration patterns in the United States, the United Kingdom, Italy, and Japan. They note especially low levels of long-distance migration among seniors in Italy and Japan. In both of these cases, the authors reason that limited financial resources and strong family ties operate to suppress later-life mobility relative to the United States and the United Kingdom where pension programs and social services for senior adults are more firmly established. Additionally, limited resources may account for the absence of a clearly defined “retirement peak” in the Japanese data.

Existing cross-national studies of later-life migration in industrialized nations are somewhat dated and additional analyses might profitably examine contemporary patterns. This is an important direction for further research given that the rate and character of later-life migration are expected to change along with industrial development. But an equally pressing issue is the absence of comparative studies that include lesser developed countries.

In Table 14.1 we offer migration estimates across specified age categories for Brazil, Chile, Costa Rica, Greece, Mexico, the Philippines, and Vietnam. Estimates presented in Table 14.1 are based on data from the Integrated Public Use Microdata Series – International (IPUMS-I) project. The IPUMS-I is a collaborative effort involving the Minnesota Population Center at the University of Minnesota together with statistical agencies and data archives around the world. Funded in part, by the National Science Foundation and the National Institute of Child Health and Human Development, IPUMS-I is a collection of individual-level data sets gathered from national samples as part of population censuses across multiple countries dating back to 1960. Each data set in the IPUMS-I collection has been cleaned, coded, and documented so as to facilitate comparative analysis across international samples. In order to generate reasonably comparable results we chose nations where (1) migration is measured in terms of change of residence in the previous five years, (2) moves across minor and major administrative boundaries are distinguished, and (3) the latest data were collected between 1999 and 2001.

Results presented in Table 14.1 indicate that across selected countries, those aged 60 and older are substantially less likely to make an interstate (or its equivalent) move as compared to their younger counterparts aged 25–59. Also, except for the Philippines, moves between major administrative units appear to be at least slightly more common in the oldest age categories. Of particular importance, only Greece and Chile, both relatively prosperous countries, exhibit reasonably well-defined retirement peaks such as those found in industrialized nations. Finally, it may not be a coincidence that the nations with the lowest GDP per capita levels, Vietnam

Table 14.1 Migration across major administrative boundaries within previous five years among persons over age 60

	Year 2000, GDP per capita in current US dollars ^a	Percentage reporting a migration within specified age categories, weighted estimates							
		25–59	60+	60–64	65–69	70–74	75–79	80–84	85+
Brazil 2000	\$4,135	3.87	1.67	1.84	1.6	1.56	1.54	1.61	1.68
Chile 2002	\$5,110	10.02	5.15	5.43	5.13	4.87	4.73	5.2	5.55
Costa Rica 2000	\$2,877 ^b	5.57	3.14	3.12	3.27	2.98	3.09	2.86	3.65
Greece 2001	\$12,278	6.44	3.04	4.05	3.06	2.54	2.31	2.58	2.72
Mexico 2000	\$5,492	4.55	2.06	2.04	1.86	1.81	2.08	2.03	2.93
Philippines 2000	\$1,073	3.58	1.39	1.53	1.42	1.34	1.19	1.09	1.18
Vietnam 1999	\$383	2.76	1.06	1.2	1.04	0.95	0.99	1.01	1.15

Source: Integrated Public Use Microdata Series – International, selected samples

^a World Economic Outlook Database, International Monetary Fund

^b 1999 GDP per capita.

and the Philippines, also report the lowest levels of later-life migration. This finding is broadly consistent with the notion that industrial development promotes later-life migration.

Results presented in Table 14.1 should be viewed as merely suggestive. Migration across major administrative boundaries may differ in character between national samples – for example, Brazilian states are substantially larger than Costa Rican provinces. Moreover, as discussed below, older adults move for a variety of reasons. Two countries may have comparable rates of later-life migration even where the predominant reasons for moving differ widely.

Later-Life Migration and Labor Force Migration

It is important to point out that it is not simply the rate of migration that varies by age. Later-life migration generally is different in kind as compared to mobility among those of working age. Working age migrants are typically powerfully influenced by differential labor force opportunities at origin and destination, other factors being equal (e.g., Borjas 1990). By contrast, the residential choices of retired people tend not to be constrained by labor force opportunity, at least not directly. Older parents may move in order to join adult children who previously migrated in response to labor force opportunities; so that an important component of later-life migration flows may “echo” labor-force migration (e.g., Van Der Geest et al. 2004). Nevertheless, it should be clear that with respect to migration decision-making, employment prospects are unlikely to be a primary consideration for elders who are no longer in the labor force.

This is not to say economic considerations are unimportant in the migration decision-making of older people. Fournier et al. (1988), present evidence to suggest that cost-of-living differences are an important predictor of the volume and direction of state-to-state later-life migration flows. According to Conway and Houtenville (2003), high living costs primarily operates to push the oldest individuals (i.e., aged 75 or older) out of expensive states. Lower taxes, moreover, generally appear to encourage in-migration for persons in their 60s, according to Duncombe et al. (2003), who analyzed intercounty migration patterns. Similarly, across states, net later-life migration flows appear to be sensitive to inheritance and income tax policies at both the origin and destination,

though the link is complex and may vary across cohorts (Conway and Houtenville 2003).

In conclusion, economic considerations enter the migration calculus differently for retirement-age migrants compared to the working-age. Graves and Waldman (1991), for example, demonstrate that older migrants appear to be attracted to counties where the supply of amenities is reflected in depressed wages rather than increased living costs, a finding that does not hold in younger cohorts.

The Advantages of Aging in Place

Dr. Robert Butler, founding director of the National Institute on Aging, has been quoted as saying, “The best place to retire is the neighborhood where you spent your life” (Boyer and Savageau 1987). It is popularly assumed that for most people who are retiring, their current place of residence holds many advantages. Often they live in a comfortable home and feel safe and secure in the known environment (Longino 1994). Friends visit them and children return, sometimes with grandchildren, for holidays or even live nearby. Ties to the local community, the neighborhood, favorite restaurants, civic and social clubs, and if they are so inclined, places of worship further connect them to a satisfying lifestyle. In addition to this, they may be close to recreational interests and places where they volunteer. The climate, too, may be acceptable and not pose a health threat. Given these potentially positive factors, why would such retirees want to move away (Longino 1994)? In any recent five year period, people over 60 are only about half as likely to make interstate moves as is the U.S. population as a whole (Longino 2006). So as implied in the title of this chapter, a useful discussion of mobility in late life must recognize that people tend to stay put when they retire.

Theoretical Perspectives on Mobility and Aging in Place

The Migration Decision Model

The oldest cluster of theories in the study of later-life migrants has come to be known as “the behavioral decision model.” It addresses the question “Why

do older people move?" and is associated with the work of Robert Wiseman (1980). Notably, Wiseman (1980) builds on Brown and Moore's (1970) model of residential mobility in the general population and adopts their division of the migration decision into two phases: the decision to move and the search for a new residence.

Decision to Move. This model assumes that individuals are continuously evaluating the suitability of their current residential situation. Most are apparently satisfied with their current place of residence when they retired and may have no motivation to move. Some, however, are not satisfied. Wiseman (1980) argues that among elders the first phase of the migration decision process is triggered by a change in circumstances or perceptions leading to decreased satisfaction with the current housing, neighborhood, or community as compared to perceived alternatives. The "triggering mechanisms" leading individuals or households to consider moving often involve important life course transitions that alter perceived residential needs. Retirement, for example, removes the location constraints imposed by labor force participation such as finding work and regularly commuting to work. Additionally, when children leave home many parents may begin to consider residential downsizing. The "triggering mechanisms" are comprised of both "push factors", such as the death of a spouse, and "pull factors", such as friends and family members residing in other places. Either can cause an individual to reevaluate his or her satisfaction with the existing residential situation (Wiseman 1980).

Among those considering a move, the decision process is shaped by factors that influence the perceived feasibility of moving. Wiseman (1980) distinguishes between relevant endogenous factors such as individual or household level characteristics, and exogenous factors such as local or regional conditions. As an example of endogenous factors, past mobility experience may reduce uncertainty associated with moving and encourage individuals to anticipate moving as a positive experience. With respect to exogenous factors, the feasibility of moving may depend a great deal on the housing market at the place of origin. Where demand is high, elders may more easily finance a move by selling their home.

Search for a New Residence. Brown and Moore (1970) argue that the search for a new residence depends on the acquisition and processing of infor-

mation regarding alternative destinations. Thus, "The household will search only those areas contained within its awareness space that satisfy the environmental and locational criteria of its aspirations, i.e., its 'search space.'" (Brown and Moore 1970: 9) For any household, the search space is a subset of its awareness space, which is comprised of destinations known through either *direct contact* through previous residence or visits such as vacations, or *indirect contact* through the recommendations of friends and family, media advertisements, and promotion by tourist bureaus and land developers.

Along these same lines, Wiseman (1980) points out that information flows are central to destination selection for many senior would-be migrants. Residential or vacation experience in a particular region, the presence of friends family, as well as promotional campaigns by local tourism bureaus, developers and the like are identified as mechanisms that bring alternative destinations into a household's search space. At the same time, Wiseman (1980: 148) argues that seniors contemplating a move toward a younger child may only have one destination in mind so that that "the selection of a destination is determined by the decision to move."

Of course, the search process may or may not be successful. Failure to secure a suitable destination may lead to adjustments to correct the sources of residential dissatisfaction, adjustments such as repairing or renovating one's home. In addition, Wiseman (1980) suggests that a substantial number of elders may be "involuntary stayers," – they may continue to experience low residential satisfaction but be unable to move because of limited resources.

Subsequent scholarship has suggested important refinements to Wiseman's (1980) migration-decision model. Cuba (1991) argues that many migrants to *amenity areas* give serious consideration to only one destination, so that distinguishing the decision to move from the selection of a destination is not always appropriate. Of 163 randomly selected older migrants in three Cape Cod communities, Cuba (1991) found that 81 per cent reported substantial "place experience" from previously having been a regular visitor or seasonal resident, and a majority had not considered any other destination. These results lead Cuba (1991) to suggest that vacation experience in a specific destination may prompt individuals and households to consider moving, in which case destination selection may actually precede the decision to move.

Haas and Serow (1993) propose a revised migration-decision model which makes no assumption as to the sequence of the decision to move and the selection of a destination. Indeed, they argue that the primacy of one as compared to the other may represent distinct styles of amenity-oriented migration. Results from a telephone survey of 814 older migrants residing in Western North Carolina found that approximately 43 per cent had not considered any alternative destinations, consistent with Cuba's (1991) result. More importantly, these migrants who were fixed on a destination before they decided to move were different from those who decided to move before they shopped for a destination. The former were pulled by personal attachments to friends while the latter were more attracted by the places, especially the amenities found in these places.

The Life Course Model

One of the oldest observations in the study of migration selectivity is that young people are more mobile than older people (Ravenstein 1885). Migration, therefore, is informed by demands and issues that arise in the life course. An early observation was that people move for many reasons concerning the youthful establishment of education, work and family statuses (Rossi 1955). It was only a matter of time until this rubric was extended to mobility at other stages of the life course. Warnes (1992), for example, developed a long list of life course events that occur, on average, at different ages. He sequenced them and discussed the housing needs and mobility patterns associated with them. In later life, the list of transitions that could motivate a move includes such things as retirement, bereavement and frailty.

Litwak and Longino (1987) were the first to present a developmental context for the patterns of elderly interstate migration, a framework that is now commonly reported in demographic studies. They argue that the nature of modern transportation and communication technology makes it easier for people to relocate and still stay in touch either through in-person visits or via the telephone or internet. These conveniences may alter the role of the kinship structure of families, including older people, as a factor stimulating midlife

and retirement related moves. It is important; however, to recognize that not all moves in later life are motivated by the same factors.

Litwak and Longino (1987) argue that three basic types of moves are associated with later life. The first tends to occur in early retirement and is driven by lifestyle considerations. These moves are often characterized as "amenity moves," and evoke an image of retirees on the golf course or in social gatherings. Pressure for the second type of move occurs when older people develop chronic disabilities that make it difficult to carry out everyday household tasks, a situation often compounded by widowhood. The theory argues that older migrants who move away from their adult children when they are healthy and married may later tend to move back toward them when, as assistance-seeking, or type-two migrants, they are disabled or widowed. A third type of move, institutional, may be triggered when family members are no longer able to provide adequate care of aged loved ones without outside help.

DeJong et al. (1995) argue effectively that poor health, reduced social affiliation, economic insecurity, having functional limitations, and getting on with life after a family crisis are all adequate reasons for moving. The life course model merely arranges some of these motivations around a type of move. The three types of moves are not prerequisites of one another and can occur at any stage of life. For example, assistance moves can occur early in the life course when young adult children "visit" their parents for extended periods between jobs or spouses, and may occur at nearly any age. Amenity moves; however, are more frequent in the early phase of later life, and assistance and institutional moves are more frequent toward the end of life.

Walters (2002) elaborated on these types of moves by showing that there are personal attributes (age, disability, marital status and income) that predict the type of move. He argues that low income is a more powerful motivator than disability for the second type of move. In addition, the place characteristics of geographical destinations are only distinctive among amenity-motivated movers. Place characteristics are not distinct among people making the second type of move, assistance and kinship moves, and therefore these movers are likely to be more dispersed geographically and, as a consequence, not very noticeable in the local older population.

The Place Identity Model

A final conceptual framework emerged during the 1990s that may be called the place identity model. Lee Cuba (1992) argues that selves as well as bodies can be mobile. Moving oneself physically to another community does not necessarily mean that one also moves emotionally or vice versa (Cutchin 2001). There are some migrants who never put down roots but remain emotionally tied to their former communities. Some of them have problems changing from being a vacationer to being a permanent resident after they arrive in their destination communities. And some assume a midlife-stretching, an “ageless self,” identity when joining the ranks of active retirees who resist stereotypes of later life (McHugh 2003).

Cuba and Hummon (1993) argue that identification with one’s dwelling, one’s community, and one’s region are arrived at differently. Personal possessions and the dwelling itself foster identification with the dwelling as “home.” This is especially so for older women. Social participation and the size of one’s friendship network are essential for strong identification with the community. And, finally, younger migrants more often base their identity on affiliations of friendship, family and emotional self-attribution, whereas older migrants do so in terms of dwelling and prior experiences with place. Weak community identity could hinder adjustment and thereby contribute to or trigger a second migration decision cycle (Stoller and Longino 2001). Finally, we confront shifts in place identity throughout our lives, and the experiences that accrue serve to inform future decisions (Watkins 1999). Place identity, therefore, must be seen as part of a long-term process of adjustment.

The Impacts of Later-Life Migration

Migrant Selectivity

There is considerable variation in the characteristics of older migrants, and variation in migrant selection leads to differential impacts at the destination. African Americans, for example, who migrate in their later years, have a strong tendency to return to their

state of birth and to the southern region (Longino and Smith 1991). Older Hispanic Americans, likewise, tend to move toward historical Hispanic enclaves in Texas, California and Florida (Biafora and Longino 1990).

Migrants tend to be better off economically than non-migrants in the destination community (Hazelrigg and Hardy 1995). In addition, some communities are especially attractive to more affluent retirees. Past vacationing patterns are related to the decision to move, and no doubt to destination choice as well (Longino et al. 2008). Not surprisingly, destinations where the cost of living is high may receive, on average, wealthier migrants. Amenity motivated migration tends to be more focused at the destination and more diffuse at the origin (Longino 2006); therefore, the impact of this type of migration is greater at the destination than areas of origin. In contrast, assistance motivated migration is more diffuse at its destination, seeking out children and other family members as care-takers wherever they live. Assistance motivated migration, therefore, has less pronounced destination impact than amenity motivated migration.

Research connecting migration selectivity with the life course model concludes that streams beget counter-streams, and counter-streams are often negatively selective (Litwak and Longino 1987). That is, the major streams of older migrants to Florida beget counter-streams back from Florida. Counter-streams are by definition smaller than streams. California, the major origin state for older migrants in the West, receives counter streams from all of its neighbors, Arizona, Nevada, Washington and Oregon. When the streams to and counter-streams from Florida were examined with data from the 1980 census, Litwak and Longino found that the characteristics of migrants differed between the two types of streams. Migrants in the streams fit the profile for the amenity-seeking migrant – they were younger, more often married and living independently. Those in the counter-streams tended to fit the assistance-seeking migrant profile. They were considerably older, on average, more often female and living dependently and returning to their state of birth.

Longino (2006) revisited the stream/counter-stream issue using data from the 2000 census, finding that there are 49 pairs of streams and counter-streams containing more than a thousand migrants in each. Four-

teen of the 49 exchanges involved streams to Florida and smaller counter-streams out of Florida. A second pattern was that all of the streams from neighboring states into California were smaller than the paired streams in the other direction. The streams to California were counter-streams. Unlike Florida, California has a negative net migration of older people.

When the characteristics of migrants to and from Florida were compared in the 2000 census microdata, the migrants to Florida still fit the amenity migrant profile in that they were, in aggregate, consistently younger, more often married, and living independently (Longino 2006). Migrant characteristics out of Florida in the paired exchanges were, as earlier research indicated, more often widowed, disabled and returning to their state of birth. This pattern even holds with exchanges between Florida and other Sunbelt states such as North Carolina, South Carolina and Tennessee. These findings suggest that the life course model was still operating in the same direction up to 2000.

Economic and Fiscal Impact

If later-life migration is selective in these ways, how are receiving communities impacted? A substantial amount of scholarship has explored the economic and fiscal implications of later-life in migration (for reviews see Reeder 1998; Serow 2003). Later-life in-migrants typically command income streams originating outside the region (e.g., Social Security, pension income) so that local expenditures inject cash into regional economies. In turn, the direct impact of local expenditures is multiplied as retiree in-migrant dollars recirculate among local businesses and consumers (e.g., Sastry 1992).

Evidence from decennial census data suggests that a sizeable amount of annual income is transferred between states as a result of elder migration. This money tends to concentrate, of course, in the major destination states (Longino and Crown 1990; Crown and Longino 1991; Sastry 1992). Between 1995 and 2000, interstate migrants aged 60 or older produced net income transfers to Florida worth approximately 8.8 billion dollars and from New York amounting to roughly 4.5 billion dollars (Longino 2006). Unfortu-

nately, a comprehensive measure of consumer spending is not included in the census microdata files. Income in these studies therefore is used as a proxy for consumer spending.

Analyses at the county-level also shed light on the economic impacts of later-life migration. Day and Bartlett (2000), for example, compare counties in the Texas Hill Country and report a positive link between later-life in-migration and income growth as well as employment and number of establishments within a variety of sectors (e.g., retail, service, financial services). Furthermore, across nonmetropolitan "retirement counties" (i.e., where estimated net-migration in the previous ten years has produced a 15 per cent increase in the 60 and older population) appear to support relatively high levels of employment growth (Glasgow and Brown 2006; Glasgow and Reeder 1990; Reeder and Glasgow 1990; Glasgow 1991). Yet, as Deller (1995) observes, counties that attract later-life in-migrants may be amenity-rich areas where the economy is buoyed by a vibrant tourist sector. Additional research may help to clarify the contribution of later-life in-migration to the relative prosperity of destination counties.

Economic simulation studies exploit data on the structure of state and regional economies in order to estimate both the direct and indirect economic impacts of later-life in-migration (Deller 1995; Sastry 1992; Stallman et al. 1999). Results suggest that the introduction of additional senior consumers may provide substantial stimulus and generate new jobs, of varied quality, across a range of sectors including retail, construction, eating and drinking establishments, real estate, health care, personal services, and financial services. At the same time, economic impacts may vary substantially depending on the characteristics of elders arriving in a given community (Stallman and Siegel 1995). Furthermore, simulation studies of this sort are limited because they do not actually measure the spending patterns of later-life migrants.

Serow and Haas (1992) collected information on expenditures from a convenience sample of 630 elder in-migrant households in Western North Carolina. They estimated a total annual impact of approximately \$71,600 per household, nearly a third of which arises from buying a home. In addition, Serow and Haas's (1992) results suggest that every two in-migrants generated roughly one new job. Bennett (1993) conducted a parallel analysis in seven non-

metropolitan counties on the South Atlantic Coast. Results were broadly similar to those reported by Serow and Haas (1992), in particular Bennett (1993) found that 90 per cent of elder in-migrants had bought or built a home within a year of arrival. An important point raised by expenditure studies is that economic impacts depend heavily on the structure of the local economy. Bennett (1993) points out that the coastal counties captured a relatively small portion of certain types of spending due to a lack of appropriate retail outlets (see also Hodge 1991).

Despite the resilience of a “gray-peril mentality” there is little evidence to suggest that later-life in-migrants typically drain public coffers in receiving communities (Longino 1988). Elder in-migrants contribution to the area tax base appears to at least balance out demand for public services (Serow and Haas 1992; Reeder et al. 1993). Insofar as health-care, relatively young and affluent amenity migrants are likely to be covered by private insurance and Medicare, so that medical services provided to amenity migrants import additional funds into the local economy (Bennett 1993; Reeder et al. 1993; Sastry 1992; Serow and Haas 1992). In fact, retired in-migrant healthcare consumers may subsidize medical services for the local indigent population (Bennett 1996).

Moreover, later life in-migrant households pay taxes to fund public education but are unlikely to place demands on local school systems (Reeder 1998). At the same time, within a given community later life in-migration may have negative implications for public school financing. Using the results of school district bond elections in Florida, Button (1992) and MacManus (1997) found lower support for school funding in districts with higher percentages of older residents and voters. This finding may reflect a tendency for voters of any age to be less supportive of public services they do not intend to use (Simonsen and Robbins 1996).

Alternatively, Berkman and Plutzer (2004) examine data from 9,129 school districts in 40 states and find that per student spending is higher where there are a relatively large number of nonmigrant elders but lower where there are a relatively large number of in-migrant elders. According to the authors, loyalty to community institutions may encourage long-term resident elders to support public schools even if they are not directly benefiting from this public service.

Social Impact

Longino (1990: 403) argued that retirees arriving in rural communities “may tend to float endlessly in a relatively rootless community, building their important social ties with other migrants... in doing so, perpetuating their separateness.” Based on a case study of one Cape Cod community, Cuba (1992) illustrates that lack of social integration and distinguishing characteristics of older migrants can make it easy for other community members (both nonmigrants and younger migrants alike) to view them as outsiders and to blame them for negative changes in the community. There are certainly reasons to believe that later-life in migration can generate social fissures and social conflict in certain situations.

Social conflict may be aggravated where older migrants are spatially concentrated. McHugh et al. (2002), for example, describe conflict surrounding efforts by residents of age-segregated communities in northwest Phoenix to gain exemption from paying school taxes. Residents of Sun City Arizona, the original age-restricted active adult community, adamantly defend their separateness and maintain a sort of fortress mentality partly in response to ageism in the broader society (McHugh and Larson-Keagy 2005).

The economic and social implications of later life in-migration may, of course, change over time; social conflict emerging relatively late. Rowles and Watkins (1993) examine three Appalachian retirement destinations illustrating overlapping stages of development. *Emergence* as a host community leads to *recognition* of the area’s potential as a retirement destination by community leaders. *Community restructuring* follows as local institutions adapt to an increasingly older population. Continued elder in-migration may lead to the point of *saturation* and generate a range of *new concerns* including crowding, traffic congestion, environmental degradation, social fragmentation, and the emergence of an economy that primarily serves the needs of newly arrived seniors.

Migration Flows

One of the defining characteristics of interstate retirement migration is that the migrants, who come from all states, are concentrated in only a few destinations,

a result of highly focused flows into certain states. In 2000, over half of older inter-state migrants in the preceding five years arrived in just ten states. Florida dominates the scene, having attracted from one-fifth to a quarter of all interstate migrants over 60 in all five census decades from 1960 to 2000. There was, however, a new phenomenon starting in the 1985–1990 migration period. There was a small, gradual, decrease in the proportion of migrants received by the major destination states, with a gentle spreading out of the flows (as compared with earlier migration periods). This increasing dispersion of destinations continued through the 1995–2000 period.

Key Sending and Receiving States

As Table 14.2 shows, the proportion of total migration going to the leading two destination states, Florida and California, has declined each decade since 1980, with California actually losing its second place ranking in 2000 to a much less populous state, Arizona. Although the declines for Florida and California were relatively small, the trend is clear and persistent. Underscoring the reality of this change, these declines are particularly noticeable because the numbers of interstate migrants leveled off between 1900 and 2000, causing the numbers, as well as the proportions, of migrants into Florida and California to drop between 1990 and 2000. There is no reason; however, to predict the demise of Florida as the leading destination for retired migrants on the basis of these recent trends. In recent years Florida has continued to attract more later-life migrants than Arizona, California and Texas combined.

In general, there is significant stability in the patterns over time. The proportion of older persons who make long-distance moves, the proportion who move to Sunbelt states, and indeed the share received or sent by the leading destination and origin states are not volatile, raising and falling decade by decade. Minor, but persistent, changes occur within a framework of considerable stability, and this predictability provides the basis for strategic planning.

Table 14.3 ranks the states by their estimated net number of older migrants. The states with the most positive net numbers tend to be Sunbelt states, although some New England and Inter-mountain Western states

appear among those with small positive net migration (Longino 2006). The states with strongly negative net migration numbers tend to be in the Middle Atlantic and upper Midwest states. Only Louisiana and California, among the Sunbelt states, have negative net migration of older people.

Sub-State Origins and Destinations

Using the 2000 census microdata files, the top 100 counties or county groups were ranked in terms of net interstate migration of older people (Longino 2006). In this ranking, Florida contains 31 of the 100 leading sub-state destinations for interstate migrants, in keeping with its longstanding status as the leading destination for older migrants. Nationally, the leading substate destinations are located in coastal, mountain and desert counties across the United States, from seaside Maine and Cape Cod in Massachusetts to coastal Oregon and the Puget Sound in Washington. Maricopa County, Arizona (Phoenix), and Clark County, Nevada (Las Vegas), rank first and third nationally, respectively, and are the leading substate destinations in the West. The second highest ranked county was Palm Beach County in Florida. Riverside County, California (Palm Springs), ranks 28th and is California's only entry on the list.

Although the Sunbelt is generally the dominant regional destination, there are attractive destinations outside of this region. Ocean County, New Jersey, for example, has consistently received enough retirees from New York and Pennsylvania to keep it among the top 100 interstate destinations for several decades.

Regional destinations attract migrants primarily from adjacent states (Cuba and Longino 1991). Examples are Cape Cod, Massachusetts, the New Jersey shore, the Pocono Mountains of northeastern Pennsylvania, all located outside the Sunbelt. The Ozark region of Missouri and Arkansas, and Western North Carolina are in the non-coastal Sunbelt. Southern and western Nevada and areas in the Pacific Northwest are also retirement areas of strong regional attraction, and they are frequently cited in retirement guides as good places to retire (Longino 2006).

The 100 counties or county groups in 2000 sending the largest numbers of interstate migrants to other states

Table 14.2 Ten states receiving most in-migrants age 60+ in five-year periods ending in 1960, 1970, 1980, 1990 and 2000

Rank	1960			1970			1980			1990			2000		
	State	#	Per cent	State	#	Per cent	State	#	Per cent	State	#	Per cent	State	#	Per cent
1	FL	208,072	22.3	FL	263,200	24.4	FL	437,040	26.3	FL	451,709	23.8	FL	401,052	19.1
2	CA	126,883	13.6	CA	107,000	9.9	CA	131,514	6.9	CA	134,183	6.4	AZ	134,183	6.4
3	NJ	36,019	3.9	AZ	47,600	4.4	AZ	94,600	5.7	AZ	98,756	5.2	CA	127,693	6.1
4	NY	33,794	3.6	NJ	46,000	4.3	TX	78,480	4.7	TX	78,117	4.1	TX	101,446	4.8
5	IL	30,355	3.3	TX	39,800	3.7	NJ	49,400	3.0	NC	64,530	3.4	NC	77,720	3.7
6	AZ	29,571	3.2	NY	32,800	3.0	PA	39,520	2.4	PA	57,538	3.0	GA	63,120	3.0
7	OH	27,759	3.0	OH	32,300	3.0	NC	39,400	2.4	NJ	49,176	2.6	NV	62,155	3.0
8	TX	26,770	2.9	IL	28,800	2.7	WA	35,760	2.2	WA	47,484	2.5	PA	60,082	2.9
9	PA	25,738	2.8	PA	28,600	2.7	IL	35,720	2.1	VA	46,554	2.4	NJ	54,425	2.6
10	MI	20,308	2.2	MO	25,300	2.3	NY	34,920	2.1	GA	44,475	2.3	VA	53,776	2.6
Total		931,012			1,079,200			1,622,120			1,901,105			2,096,841	
Interstate Migrants															
Per cent of Total in Top 10 States			60.7			60.4			59.5			56.3			54.3

Table 14.3 States ranked by the net number of migrants age 60+, 1995–2000

Rank	State	# of In-migrants	# of Out-migrants	Net # of Migrants
1	Florida	401,052	171,300	229,752
2	Arizona	134,183	52,403	81,780
3	North Carolina	77,720	42,731	34,989
4	Nevada	62,155	27,243	34,912
5	South Carolina	47,698	25,229	22,469
6	Texas	101,446	79,938	21,508
7	Georgia	63,120	41,985	21,135
8	Tennessee	50,036	31,853	18,183
9	Alabama	31,155	23,307	7,848
10	Arkansas	29,876	23,138	6,738
11	New Mexico	24,893	18,503	6,390
12	Oregon	40,778	35,905	4,873
13	Mississippi	19,433	14,951	4,482
14	Delaware	12,140	7,786	4,354
15	Missouri	40,363	36,651	3,712
16	Oklahoma	26,923	23,512	3,411
17	Montana	10,896	8,048	2,848
18	Idaho	15,313	12,553	2,760
19	Virginia	53,776	51,456	2,320
20	Utah	15,300	13,213	2,087
21	Maine	13,112	11,337	1,775
22	Colorado	40,320	38,546	1,774
23	Washington	47,192	46,024	1,168
24	New Hampshire	15,417	14,675	742
25	Vermont	6,591	6,345	246

were the comparatively populous metropolitan or suburban counties, led by Los Angeles County, California, and Cook County, Illinois. Not surprisingly the majority (58) of these counties or county groups were from outside the Sunbelt. The surprise is that the remaining 42 are located in the states that attract a large number of interstate migrants. Thirteen of these counties are located in Florida. These Florida counties receive far more interstate migrants than they lose to counties outside of Florida. However, migrants of retirement age do leave Florida and other Sunbelt states, a point often missed by media accounts of retirement migration. Indeed, Florida ranks third, below only New York and California in number of older out-migrants (Longino 2006). Counter-stream and returning to one's state of birth, as well as the large population base in these states, help to explain the substantial out-migration from the major receiving states.

When the 100 leading origin counties (or county groups) are examined, it is seen that nearly all are

large metropolitan or suburban counties. This fact helps to explain why interstate migrants like to move to counties that have a lower cost of living, are less congested, and are more scenic than the counties they leave. Nonetheless, the major receiving counties tend to be either metropolitan counties themselves or are not far from metropolitan counties (e.g., Dade and Hillsborough counties in Florida and Maricopa County in Arizona) and thus able to support important aspects of the migrants' former metropolitan lifestyles.

Seasonal Migration

The Census Bureau does not attempt to directly measure seasonal migration. However, there have been several useful local surveys that provide information on this topic. Survey results (McHugh and Mings 1991) have identified Arizona seasonal migrants as overwhelmingly Caucasian, retired, healthy and married couples who most often are in their sixties. These are characteristics that other studies have associated with amenity migration. McHugh and Mings were the first to document the common assumption that the colder the climate the more likely migrants are to migrate seasonally. United States retirees in states along the Canadian boarder have a greater propensity to migrate seasonally than those who live further south. And many seasonal migrants to Sunbelt destinations come from Canada.

When is seasonal migration only a precursor to a permanent move? The answer seems to depend on the balance between the seasonal migrants' ties to places and persons at origin and destination, and the shift in these ties over time, in keeping with Lee's (1966) push-pull model. The vast majority of seasonal migrants, perhaps 80 per cent, apparently do not relocate permanently (McHugh 1990). They often extend or shorten their visits over time, and then finally end their extended series of visits when their health forces them to do so. Arizona seasonal migrants tend to adjust to health decrements over time, reducing the number of side trips and giving up their recreational vehicles in favor of rental lodging during their seasonal trips (McHugh and Mings 1994).

McHugh et al. (1995) found that seasonal migration often occurs in stages, beginning with vacationing in midlife and leading to longer stays in the retirement years. When those who moved to Arizona only for the

winter were combined with those who left during the summer, and those who moved within Arizona seasonally, Hogan and Steinnes (1998) estimated that one-fourth of older persons in the state fall into one of these categories.

Predicting Mobility: Insights Gained from Panel Studies

There is a limit to what can be learned from cross-sectional and trend data such as the decennial Census, or one-time surveys of seasonal migrants. Relevant theory posits a complex decision-making process that cross-sectional data are unable to fully capture. The census mobility item asks about residence five years ago, allowing movers over this time interval to be identified. Yet data are collected after reported moves and are thus largely inappropriate for testing causal models of later-life migration.

A number of studies investigate migration decision-making using community or regional samples. Several rely on respondents who are older migrants in amenity-rich destinations to describe and characterize the process that lead to their move (Haas and Serow 1993, 1997; Cuba 1989, 1991; Cuba and Longino 1991; Carlson et al. 1998). By contrast, Longino et al. (2002) employ a sample of later-life migrants in Florida and another aging in place in Minnesota in order to collect information from both movers and nonmovers. They argue that migrants can shed light on only a portion of the decision-making process.

The importance of collecting information from both movers and nonmovers is evident in the fact that half of the Minnesota sample, in Longino et al.'s (2002) study had given "serious consideration" to a move. Among other findings, the researchers note that climate was a key motivating factor in both samples. Many of those aging in place extolled Minnesota's mild summers and the change of seasons. In addition, both groups reported high levels of residential satisfaction. Yet, as Longino et al. (2002: 48) point out, "Perhaps the great advantages of living in some place... are constructions drawn around oneself to justify the residence, rather than motivating a move." Retrospective studies are unable to account for this possibility.

A prospective approach to predicting migration is to examine the factors associated with migration inten-

tions. Pampel et al. (1984), for example asked randomly selected Iowa residents aged 55–64 to assess their interest in moving across 27 hypothetical retirement destinations. Descriptions of these hypothetical destinations were designed to isolate the main effects of several location factors (e.g., climate, type of terrain, proximity to ocean or lakes, proximity to good health care, proximity to close family). Results suggested relatively low overall interest in moving, though, interest in moving was higher for hypothetical destinations with a warmer climate and lower living costs.

Oldakowski and Roseman (1986) sampled Chicago residents aged 18 or older, divided into different age groups, in order to examine factors shaping their expectation of moving out of the Chicago area within the next five years. As compared to both younger and older age groups, ties to potential destinations appear to be an especially important factor associated with plans to move among those approaching retirement (i.e., aged 50–64).

In order to examine the decision-making of potential counterstream return migrants Stoller and Longino (2001) analyzed data from a sample of older in-migrants residing in Florida. Their findings suggest that person ties in the community of origin (e.g., children and siblings "living back home") are an important predictor of anticipating a homeward move. Based on a sample of Chicagoans aged 65 and older, Oh (2003) finds evidence to suggest that social bonds within one's neighborhood indirectly depress the intention to make some sort of move by positively influencing residential satisfaction. But, of course, prospective studies are limited in that *intended* moves are not *actual* moves.

Evidence from panel studies that use theoretically relevant measures to predict subsequent mobility is particularly compelling. Though a range of later-life migration studies employ a panel design (e.g., Colsher and Wallace 1990; Meyer and Speare 1985; Robison and Moen 2000; Teaford 1992), we focus attention here on those using nationally representative samples.

The Longitudinal Study on Aging (LSOA) is one such panel study, based on a nationally representative sample of persons aged 70 or older at baseline in 1984. Worobey and Angel (1990) focused on unmarried elders from the LSOA, and examined the predictors of dependent living arrangements at follow-up interviews in 1986. Among other findings, functional capacity in 1984 and deteriorating functional capac-

ity were both linked to increasingly dependent living arrangements by 1986 (i.e., living with others or living in an institution). Worobey and Angel (1990) were not interested in moving *per se* so that shifting living arrangements do not necessarily mean that an elder moved.

Speare et al. (1991) employed the LSOA to test the idea that increased disability among seniors creates pressure to make residential adjustments. Disability, poor subjective health, and age at baseline were all positively associated with having moved into an institution by follow-up in 1986. Those living with a spouse at baseline were at lower risk of mobility and institutionalization. With respect to the likelihood of a residential move, findings suggest that, rather than baseline disability, it is deteriorating functional capacity that predicts a move in the oldest age cohorts.

In order to focus attention on the precursors to an assistance move Longino et al. (1991) distinguish between moderate and severe functional disability and limit analysis to LSOA respondents living in the community at follow-up in 1986. Their results suggest that though baseline levels of moderate disability are not significant, increased difficulty with Instrumental Activities of Daily Living (IADLs) (e.g., shopping, preparing meals, managing money) between 1984 and 1986, is linked to an increase in the likelihood of making a residential move during the same period.

Further analyses based on community-dwelling LSOA panel member in 1984 and 1986 suggest that the impact of deteriorating functional health on residential mobility is moderated by available social resources. According to Bradsher et al. (1992) interwave increases in IADLs have a significantly stronger impact on the likelihood of having moved by 1986, among those recently widowed as compared to others. Similarly, Zimmerman et al. (1993) suggest that the stress of deteriorating functional health is buffered by the perceived availability of someone in the home to provide care if necessary for three or more weeks.

Miller et al. (1999) employ four waves of LSOA data collected semiannually between 1984 and 1990. They measure functional health with greater precision than earlier studies, and find that the implications of deteriorating functional health appear to depend on the type of difficulties experienced. Whereas, interwave increases in Basic Activities of Daily Living (BADLs) (e.g., bathing, dressing), had no statistically discernible effect, increased difficulty with Advanced Activities of

Daily Living (AADL) (i.e., managing money, using the telephone, eating) and Lower Body Limitations (LBL) (e.g., difficulty “walking a quarter of a mile”) are associated with a greater likelihood of having made a non-institutional move in the same two-year period. These findings are intuitive in that AADL’s and LBL’s are likely to generate the kind of “environmental press” that might be resolved via a residential move.

Thus, available evidence from the LSOA supports Litwak and Longino’s (1987) contention that declining functional health, in the absence of support from a spouse or adult child, generates pressure for older adults to move. Yet even in the oldest age cohorts represented in the LSOA, there is no expectation that residential moves would be exclusively health-motivated. Bradsher, et al. (1992: S267) argue that amenity-oriented moves may occur at any age, given that age is an imperfect proxy for lifecourse, and that, “motivations for residential change... are complex and multifaceted.”

DeJong et al. (1995) directly address the complex motivations for later-life moves using data from the 1984–1990 LSOA. Respondents that moved during the study period were asked to provide reasons for relocating, which the researchers used to construct theoretically and empirically informed “reason-for-move categories” (e.g., health, functional independence). Results indicate a wide variety of motivations; declining health was offered as the primary reason for moving in 19 per cent of cases. Moreover, the precursors of a move appear to vary substantially across “reason-for-move” categories. Of particular importance, measured increases in instrumental disability are positively linked to health-motivated moves but negatively associated with both comfort-motivated moves (e.g., seeking a better neighborhood or more agreeable climate) and economic security-motivated moves (i.e., affordable housing).

Yet, all of these authors who use LSOA data point out that limitations imposed by the data generate an irresolvable temporal ambiguity. Functional capacity changes and residential adjustments between baseline and follow-up are measured but not dated so that it is impossible to empirically establish the correct temporal order of events. This is an important issue because the relationship between health and migration is complex and it is likely that some portion of between-wave changes in health may be the result of moving rather than the cause (see Findley 1988).

Furthermore, within the LSOA residential mobility between panel waves was captured, but not the distance

of the move. Thus, LSOA-based studies are unable to distinguish between local and long-distance moves, even though the two are almost certainly different-in-kind (e.g., Wiseman 1980). This is a nontrivial limitation. For an elder experiencing environmental stress resulting from functional decline, residential mobility is only one possible adaptation strategy. Long-distance moves are generally more costly and disruptive than local moves and should figure differently into the migration calculus.

Additionally, though LSOA-based studies shed light on mobility among those aged 70 or older, these findings cannot be generalized to the young-old population. Litwak and Longino's (1987) lifecourse model anticipates a larger proportion of moves to be amenity oriented among those approaching retirement or recently retired as compared to those in older age groups. The Health and Retirement Study (HRS) represents an important opportunity to examine the causes of migration among the young-old. An ongoing panel study, initiated in 1992, the HRS is based on a representative sample of US households containing at least one person aged 51–61 at baseline (see Juster and Suzman 1995).

Bradley et al. (2008) examine the actuation of mobility intentions using five waves of HRS data, collected semi-annually between 1994 and 2002. Not surprisingly, they find a strong connection between migration intentions and migration outcomes. Of those households at baseline that were "certain" of a move in the coming two years, the estimated probability of having moved during that period was .48 for non-couple households and .55 for couple households.

Additional results suggest that the actuation of mobility intentions may operate differently for non-couple as compared to couple households. In order to explore household level factors that may condition whether or not intended moves are actuated Bradley, et al. (2008) construct a series of event-history models among those households reporting some expectation of moving at baseline. Findings indicate that among couple households, wealth is positively associated with the likelihood of completing an independent long-distance move (i.e., neither parents nor children at destination). In non-couple households, by contrast, wealth is negatively linked to independent long-distance moves. For many "young old" singles, expected moves are not necessarily desired moves and wealthier individuals may be better equipped to avoid moving.

Exploiting five waves of HRS data, Longino et al. (2008) use event-history models to examine the causal link between theoretically-relevant predictors, measured in 1994, and long-distance migration across a study period ending in 2002. Findings underscore the importance of person-ties at origin. Net of appropriate controls, those having parents or children living nearby were significantly less likely to move as compared to others. Similarly, ties to neighbors appear to discourage long-distance migration, according to the authors' results. But other kinds of community ties may also be important. Natives to a given area were less likely than others to move away, as were homeowners. Ties to potential destination areas are almost certainly of equal importance. Along these lines, Longino et al. (2008) find that having a regular vacation destination at baseline increases the likelihood of a future long-distance move by about 46 per cent net of controls. A positive effect of comparable magnitude is evident with respect to second home ownership, according to these same results.

Microlevel Impacts – Implications for Health and Well-Being

How do residential mobility and migration impact older individuals and their families? With the exception of forced relocations, migration is typically the product of rational decision-making. The intention to move depends on the expectation that migration will lead to the realization of some valued goal or set of goals (DeJong 1999; DeJong and Fawcett 1981). If voluntary migration is motivated by instrumental considerations, it is not unreasonable to suppose that elders may often enjoy improved life circumstances as a result of moving.

Along these lines, Ferraro (1981) examines the residential satisfaction of older movers. Analyses are based on a sub-sample of noninstitutionalized low and middle income elders, from the 1973 and 1974 waves from the Survey of the Low-Income Aged and Disabled. Relocates who at baseline were "desiring to move" reported enhanced housing and neighborhood satisfaction in their new as compared to their former homes.

Further, Oswald et al. (2002), interviewed 217 older Germans who had moved within the past three years in order to see if the goals motivating relocation were realized. The researchers concluded that subjects had

proactively enhanced their residential environments by moving. In addition, in several cases motivations for migration were linked to specific kinds of improvements. For example, movers motivated by a desire to improve their physical environment (e.g., a safer, nicer place to live) reported improved accessibility to key resources (i.e., physician, grocery store, and public transportation). Though as the authors are well aware, retrospective assessments of improvement may be biased by the subjects' desire to justify the expense and trouble of the move itself, Oswald et al.'s (2002) results support the notion that elders may improve their lives through migration.

At the same time, moving is a particularly stressful life-event that may have negative implications for the health and well-being of senior adults. One body of relevant research examines the impact of institutional moves, whether moving from the community into an institution or moving between institutions (see Baglioni 1989 and Danermark and Ekstrom 1990 for reviews). We focus on the implications of non-institutional or community to community moves, which have received substantially less attention. Most early studies employed small nonrepresentative samples, yielding mixed results (see Baglioni 1989 for review). Analyses that employ nationally representative longitudinal data are of particular importance.

Among the earliest such studies, Ferraro (1982) exploits data from the 1973 and 1974 waves from the Survey of the Low-Income Aged and Disabled, using a sub-sample representative of low and middle income elders living in the community. Residualized change models indicate negative relocation effects across a range of health indicators (i.e., days spent ill in bed, days hospitalized or institutionalized, difficulty with daily activities, self-care capacity).

Choi (1996) generates similar findings using the LSOA, 1984–1990, a nationally representative panel of persons 70 or older at baseline as described above. Initial health status did not predict subsequent residential mobility, though movers experienced steeper interwave health declines. However, Choi (1996) notes that among relocatees, those who experienced the greatest health declines were health-motivated movers who were predisposed to health problems prior to the move.

Careful readers will note that both Ferraro (1982) and Choi (1996) present findings that mirror previously described studies portraying residential mobility

as a response to deteriorating functional health (e.g., Miller et al. 1999; Speare et al. 1991; Zimmerman et al. 1993). Though interpreted differently, between-wave declines in health are consistently found to be associated with the likelihood of having moved during the same period. But is it declining health that causes migration or migration that causes a decline in health? Perhaps, the relationship is bidirectional.

The temporal ordering of health and migration among older adults has not yet been empirically resolved. Toward that end, Chen and Wilmoth (2004) return to the LSOA data but construct analyses that distinguish between short-term functional health implications (i.e., changes that occur during the same interval as the move) and long term functional health implications (i.e., changes that occur during the interval after the move). As in previous studies, initial results suggest greater functional disability (i.e., difficulty with ADL's and IADL's) among movers in the short-term. However, short-term functional decline was only evident among health-motivated movers who prior to the move may have been on a declining health trajectory.

Also important, Chen and Wilmoth (2004) were unable to generate evidence of long-term impacts. In terms of functional disability, respondents who had moved between 1984 and 1988, were no different from never-movers by the end of the subsequent two-year interval in 1990. Even health-motivated movers over the long-term were statistically indistinguishable from never-movers with respect to functional disability. Chen and Wilmoth (2004) argue that these results may indicate that moving allows persons to achieve a better match between their own needs and the opportunities and challenges presented by their residential environments.

Even so, as Chen and Wilmoth (2004) note, the LSOA data do not permit the relationship between health and migration to be completely disentangled. We join them in calling for analyses using longitudinal data collected at regular intervals that include timing of health changes and migration events. Even with such data, the health-migration connection is sufficiently complex so as to provide researchers with a number of challenging issues (see Findley 1988). For example, post-move health declines are not necessarily caused by moving, because elders who move may be self-selected such that those who anticipate deteriorating health will be more likely to move. Moreover, it may

be that negative health effects associated with migration are short-lived, as others have suggested (Findley 1988; Chen and Wilmoth 2004). In this case, a simple comparison of the health of movers vs. non-movers at follow-up might dilute the effect of relocation by treating those who had moved within the last month the same as those who moved just after the previous interview possibly two years prior.

Discussion and Conclusions

In the course of discussion we have alluded to areas where additional research is needed and have highlighted findings that might be clarified through further analysis. A broader observation is that there are relatively few later-life migration studies that focus on racial/ethnic minorities (e.g., Biafora and Longino 1990; Longino and Smith 1991; Watkins 1989). Existing research examines differential rates of migration and group-specific patterns with respect to interstate flows, but a range of important questions remain to be answered. For example, Longino et al. (2008) demonstrate that African American elders are less than half as likely to make a non-local move as compared to their White counterparts net of a range of relevant factors (e.g., marital status, education, economic resources, self-assessed health, travel experience indicators, home ownership, and ties to the community of origin). Why are African American seniors than others less likely to move? Careful attention to this question is warranted for any number of reasons, not least because, as noted above, migration is typically motivated by instrumental considerations, a strategy by which seniors seek to improve their lives.

How will later-life migration within the industrialized nations of Europe and North America be impacted by large cohorts born in the decades following World War II? This is an impossible question to answer with any confidence. A closer look at the United States illustrates the range of factors that may bear on later-life mobility over the near future in Europe and North America. In the United States, seventy-five million "baby boomers" born in the US between 1946 and 1964 will drive a dramatic increase in the 65 and older population between 2010 and 2030. Almost certainly we should anticipate an increase in the absolute number of later-life movers over the same period.

But will boomers' post-retirement mobility behavior be different from that of the preceding generation? There is reason to suspect stability in the overall rate of interstate migration. As previously noted, the proportion of 60 and older reporting an interstate move has changed little since 1960 (see Longino 2006).

Alternatively, boomers may in some ways be better equipped to make an amenity move in their later years than were previous generations. Compared at mid-life, baby boomers relative to the cohort born between 1926 and 1935 were more than twice as likely to have earned a college degree (Frey and DeVol 2000). Consistent with material presented above, higher levels of education should be linked with relatively high rates of long-distance mobility. Moreover, boomers as a group appear to be economically advantaged compared to their parents' status at roughly the same age (see Radner 1998). Perhaps enhanced financial resources will support higher rates of long-distance mobility among boomer seniors as compared to previous generations.

At the same time, the baby boom cohort is characterized by substantial internal diversity which should not be overlooked (Longino 1998). Despite the prosperity enjoyed by privileged boomers, compared to the cohort born between 1926 and 1935, baby boomers were about 50 per cent more likely to live in poverty at mid-life (Frey and DeVol 2000). A relatively large portion of boomers will have only limited resources upon retirement.

Even for relatively affluent boomer retirees the capacity to finance a long-distance amenity move cannot be taken for granted. In recent decades, rising home values have allowed seniors to realize substantial economic gains that could be used to purchase a new home in an amenity-rich destination (see Steinnes and Hogan 1992). However, boomers may find it difficult to realize these kinds of gains. Owing to the relatively small size of younger cohorts, upon retirement, boomers may find limited market demand for their homes (Stallman and Siegel 1995).

Moreover, relative to older cohorts, members of the baby boom are more likely to be covered by defined contribution rather than defined benefit pension plans. Boomers may find that they will have to work longer under defined contribution plans in order to generate pension wealth comparable to that enjoyed by previous retirees covered by defined benefit plans. Delayed retirement

among boomers may reduce the likelihood of completing an amenity-oriented move (Haas and Serow 2002).

Perhaps more important is the fact that many boomers will be living in amenity-rich areas upon retirement. Frey and Devol (2000) show that most of the metro areas with relatively large baby boomer populations are in southern or western states (e.g., Santa Fe, NM, Denver, CO, Atlanta, GA) reflecting labor force migration flows over the past several decades. Disproportionate shares of boomers are also found in a number of high-amenity metro areas across New England (e.g., Portland, ME, Burlington, VT).

The current concentration of boomers in amenity-rich metro areas may suggest that a smaller portion will have an incentive to move upon retirement. Alternatively it may simply turn out that among boomers a relatively large portion of later-life moves will be intraregional rather than interregional. Boomers residing in southern or western metro areas may make amenity moves toward less crowded areas in the same region that offer scenic beauty as well as cultural and recreational amenities. Atlanta, for example, is within easy reach of tourist areas in the mountains of north Georgia and North Carolina.

As a final consideration, we cannot assume that baby boomers will have the same housing preferences as previous generations of retirees. McHugh and Larson-Keagy (2005) argue that the emergence of age-segregated “active adult” communities following the Sun City model was driven partly by stereotypical depictions of aging as a period of inevitable decline and decay. Sun City and its offspring traditionally marketed themselves as enclaves supporting active retirement and disproving ageist stereotypes. But McHugh and Larson-Keagy (2005) suggest that these ageist stereotypes are eroding and so is demand for Sun City type havens from ageism. New multigenerational “lifestyle” communities offer a full range of amenities likely to attract recent retirees (e.g., golf course, pools, etc.) but avoid names and marketing strategies that connote retirement havens. Instead, a conspicuous trend has been the promotion and marketing of “ageless people pursuing lives of active leisure in idyllic environments.” (McHugh and Larson-Keagy 2005: 253).

We have covered a great deal of ground in this chapter. Amenity migration to Florida and other select destinations garners substantial media attention, partly obscuring (1) low rates of long-distance migration

among seniors and (2) the fact that later-life movers comprise an internally heterogeneous category. Our review certainly illustrates that migration among older adults is multifaceted so as to defy simple generalizations as to its causes and consequences.

References

- Baglioni A (1989) Residential relocation and health of the elderly. In: Markides KS, Cooper CL (eds) Chichester, aging, stress, and health. Wiley, England, pp 119–137
- Bennett DG (1993) Retirement migration and economic development in high-amenity, nonmetropolitan areas. *J Appl Gerontol* 12:466–481
- Bennett DG (1996) Implications of retirement development in high-amenity non-metropolitan coastal areas. *J Appl Gerontol* 15:345–360
- Berkman MB, Plutzer E (2004) Gray peril or loyal support? The effects of the elderly on educational expenditures. *Soc Sci Q* 85(5):1178–1192
- Biafora R, Longino CF Jr (1990) Elderly hispanic migration in the United States. *J Gerontol: Soc Sci* 45:S212–S219
- Borjas G (1990) Friends or strangers: The impact of immigrants on the US economy. Basic, New York
- Boyer R, Savageau D (1987) Retirement places rated. Rand McNally and Company, Chicago
- Bradley DE, Longino CF Jr, Stoller EP, Haas WH, III (2008) Expected mobility and subsequent long-distance migration among older adults: An event history analysis using panel data from the health and retirement study, 1992–2002. *Gerontologist*, forthcoming
- Bradsher JE, Longino CF Jr, Jackson DJ, Zimmerman RS (1992) Health and geographic mobility among the recently widowed. *J Gerontol: Soc Sci* 47(5):S261–S268
- Brown LA, Moore EG (1970) The intra-urban migration process: A perspective. *Geografiska Annaler* 52B:1–13
- Button JW (1992) A sign of generational conflict: The impact of Florida’s aging voters on local school and tax referenda. *Soc Sci Q* 73:786–797
- Carlson JE, Junk VW, Fox LK, Rudzitis G, Candra SE (1998) Factors affecting retirement migration to Idaho: An adaptation of the amenity retirement migration model. *Gerontologist* 38(1):18–24
- Chen P, Wilmoth JM (2004) The effects of residential mobility on ADL and IADL limitations among the very old living in the community. *J Geront: Soc Sci* 59B(3):S164–S172
- Choi NG (1996) Older people who move: Reasons and health consequences. *J Appl Gerontol* 15(3):325–344
- Colsher PL, Wallace RB (1990) Health and other social antecedents of relocation in rural elderly persons. *J Gerontol* 45(1): S32–S38
- Conway KS, Houtenville AJ (2003) Out with the old, in with the old: A closer look at younger versus older elderly migration. *Soc Sci Quart* 84(2):309–328
- Crown WH, Longino CF, Jr (1991) State and regional policy implications of elderly migration. *J Aging Soc Policy* 3(1/2):185–207

- Cuba LJ (1989) Retiring from vacationland: From visitor to resident. *Generations* 13(2):63–67
- Cuba LJ (1991) Models of migration decision making reexamined: The destination search of older migrants to Cape Cod. *Gerontologist* 31(2):204–209
- Cuba LJ (1992) Retiring from vacationland: From visitor to resident. *Generations* 13:63–67
- Cuba LJ, Longino CF Jr (1991) Regional retirement migration: The case of Cape Cod. *J Gerontol: Soc Sci* 46:S33–S42
- Cuba LJ, Hummon DM (1993) A place to call home: Identification with dwelling, community and religion. *Sociol Q* 34:111–131
- Cutchin, M (2001) Deweyan integration: Moving beyond place attachment in elderly migration theory. *Inter J Aging Hum Dev* 52:29–44
- Danermark B, Ekstrom M (1990) Relocation and health effects on the elderly. *J Sociol Soc Welf* 17:25–49
- Day FA, Barlett JM (2000) Economic impact of retirement migration on the Texas hill country. *J Appl Gerontol* 19(1):78–94
- DeJong GF (1999) Choice processes in migration behavior. In: Withers PK (ed) *Migration and restructuring in the United States: A geographic perspective*, Rowan & Littlefield Publishers Inc, New York
- DeJong GF, Fawcett JT (1981) Motivations for migration: An assessment and a value-expectancy research model. In: DeJong GF, Gardner RW (eds) *Migration decision making: Multidisciplinary approaches to microlevel studies in developing and developed countries*, Pergamon Press, New York, pp 13–58
- DeJong GF, Wilmoth JM, Angel JL, Cornwell GT (1995) Motives and the geographic mobility of very old Americans. *J Gerontol: Soc Sci* 50B:S395–S404
- Deller SC (1995) Economic impact of retirement migration. *Econ Dev Q* 9(1):25–38
- Duncombe W, Robbins M, Wolf, DA (2003) Place characteristics and residential location choice among the retirement-age population. *J Geront: Soc Sci* 58B:S244–S252
- Ferraro, KF (1981) Relocation desires and outcomes among the elderly. *Res Aging* 3(2):166–181
- Ferraro KF (1982) The health consequences of relocation among the aged in the community. *J Geront* 38(1):90–96
- Findley SE (1988) The directionality and age selectivity of the health-migration relation: Evidence from sequences of disability and mobility in the United States. *Int Migr Rev* 22(3):4–29
- Fournier GM, Rasmussen DW, Serow WJ (1988) Elderly migration as a response to economic incentives. *Soc Sci Q* 69:245–260
- Franklin RS (2003) *Migration of the young, single, and college educated: 1995–2000*. Census Bureau, Washington, DC, U.S
- Frey WH, DeVol RC (2000) *America's demography in the new century: Aging baby boomers and new immigrants as major players*. Milken Institute, Santa Monica, California
- Glasgow NL (1991) A place in the country. *Am Demogr* 13(3):24–30
- Glasgow N, Brown DL (2006) Social integration among older in-migrants in nonmetropolitan retirement destination counties: Establishing new ties. In: Kandel WA, Brown DL (eds) *Population change and rural society*. Springer, The Netherlands, pp 177–196
- Glasgow N, Reeder RJ (1990) Economic and fiscal implications of nonmetropolitan retirement migration. *J Appl Gerontol* 9(4):433–451
- Graves PE, Waldman DM (1991) Multimarket amenity compensation and the behavior of the elderly. *Am Econ Rev* 81(5):1374–1381
- Haas WH III, Serow WJ (1993) Amenity retirement migration process: A model and preliminary evidence. *Gerontologist* 33:212–220
- Haas WH, Serow WJ (1997) Retirement migration decision making: Life course mobility, sequencing of events, social ties and alternatives. *J Community Dev Soc* 28(1):116–130
- Haas WH, Serow WJ (2002) The baby boom, amenity retirement migration, and retirement communities: Will the golden age of retirement continue? *Res Aging* 24(1):150–164
- Hazelrigg LE, Hardy MA (1995) Older adult migration to the sunbelt: Assessing income and related characteristics of recent migrants. *Res Aging* 17:209–234
- Hobbs FB, Damon BL (1996) *65+ in the United States*. Bureau of the Census, Washington, DC
- Hodge G (1991) The economic impact of retirees on smaller communities. *Res Aging* 13(1):39–54
- Hogan TD, Steinnes DN (1998) A logistic model of the seasonal migration decision for elderly households in Arizona and Minnesota. *Gerontologist* 38:152–158
- Juster FT, Suzman R (1995) An overview of the Health and Retirement Study. *J Hum Res* 30:S7–S56
- King R, Warnes T, Williams A (2000) *Sunset lives: British retirement migration to the mediterranean*. Oxford, New York
- Law CM, Warnes AM (1982) The destination and decision in retirement migration. In: Warnes AM (ed) *Geographical perspectives on the elderly*, Wiley, Chichester, pp 53–82
- Lee ES (1966) A theory of migration. *Demography* 3:147–157
- Litwak E, Longino CF Jr (1987) Migration patterns among the elderly: a developmental perspective. *Gerontol* 27:266–272
- Longino CF Jr (1988) The gray peril mentality and the impact of retirement migration. *J Appl Gerontol* 7(4):448–455
- Longino CF Jr (1990) Retirement migration streams: Trends and implications for North Carolina communities. *J Appl Gerontol* 9(4):393–404
- Longino CF Jr (1994) Where retirees prefer to live: The geographical distribution and migration patterns of retirees. In: Monk A (ed) *The Columbia retirement handbook*. Columbia University Press, New York, pp 405
- Longino CF Jr (1998) Geographic mobility and the baby boom. *Generations* 22(1):60–64
- Longino CF Jr (2006) *Retirement migration in America*, 2nd edn. Houston: Vacation Publications.
- Longino CF Jr, Bradley DE, Stoller EP, Haas WH III (2008) Predictors of migration among older adults: A prospective study. *J Gerontol: Soc Sci* 62, forthcoming
- Longino CF Jr, Crown WH (1990) Retirement migration and interstate income transfers. *Gerontologist* 30:784–789
- Longino CF Jr, Jackson DJ, Zimmerman RS, Bradsher JE (1991) The second move: Health and geographic mobility. *J Gerontol: Soc Sci* 46 (4):S218–S224
- Longino CF, Perzynski AT, Stoller EP (2002) Pandora's briefcase: Unpacking the retirement migration decision. *Res Aging* 24(1):29–49
- Longino CF Jr, Smith KJ (1991) Black retirement migration in the United States. *J Gerontol Soc Sci* 46:S125–S132

- McHugh KE (1990) Seasonal migration as a substitute for, or precursor to, permanent migration. *Res Aging* 12:229–245
- McHugh KE (2003) Three faces of ageism: Society, image and place. *Aging Soc* 23:165–185
- McHugh KE, Hogan TD, Happel SK (1995) Multiple residence and cyclical migration: A life course perspective. *Prof Geogr* 47(3):251–267
- McHugh KE, Larson-Keagy (2005) These white walls: the dialectic of retirement communities. *J Aging Stud* 19:241–256
- McHugh KE, Mings RC (1991) On the road again: Seasonal migration to a Sunbelt metropolis. *Urban Geogr* 12:1–18
- McHugh KE, Mings RC (1994) Seasonal migration and health care. *J Aging Health* 6:111–122
- McHugh K, Gober P, Borough D (2002) The Sun City wars: Chapter 3 *Urban Geogr* 23(7):627–648
- MacManus S (1997) Selling school taxes and bond issues to a generationally diverse electorate: Lessons from Florida referendum. *Gov Finan Rev*, April 17–22
- Meyer JW, Speare A Jr. (1985) Distinctively elderly mobility: Types and determinants. *Econ Geogr* 61(1):79–88
- Miller ME, Longino CF Jr, Anderson RT, James MK, Worley AS (1999) Functional status, assistance, and the risk of a community-based move. *Gerontologist* 39(2):187–200
- Oh JH (2003) Social bonds and the migration intentions of elderly urban residents: The mediating effect of residential satisfaction. *Popul Res Policy Rev* 22:127–146
- Oldakowski RK, Roseman CC (1986) The development of migration expectations: Changes throughout the lifecourse. *J Gerontol* 41(2):290–295
- Oswald F, Schilling O, Wahl HW, Gäng K (2002) Trouble in paradise? Reasons to relocate and objective environmental changes among well off older adults. *J Environ Psychol* 22:273–288
- Pampel FC, Levin IP, Louviere JJ, Meyer RJ, Rushton G (1984) Retirement migration decision making: The integration of geographic, social, and economic preferences. *Res Aging* 6(2):139–162
- Radner DB (1998) The retirement prospects of the baby boom generation. *Social Security Bulletin* 61(1):3–19
- Ravenstein EG (1885) The laws of migration. *J R Stat Soc* 48:167–227
- Reeder RJ (1998) Retiree-attraction policies for rural development. *Agriculture Information Bulletin No. 741 Economic Research Service, US Department of Agriculture*
- Reeder RJ, Glasgow NL (1990) Non-metro retirement counties' strengths and weaknesses. *Rural Dev Perspect* 6(2):12–17
- Reeder RJ, Schneider MJ, Green BL (1993) Attracting retirees as a development strategy. In Barkley DL (ed) *Economic adaptation: Alternatives for Nonmetropolitan areas*. Boulder, Westview Press, CO, pp 127–144
- Robison JT, Moen P (2000) A life-course perspective on housing expectations and shifts in late midlife. *Res Aging* 22(5):499–532
- Rogers A (1988) Age patterns of elderly migration: An international comparison. *Demography* 25(3):355–370
- Rogers A, Watkins JF, Woodward JA (1990) Interregional elderly migration and population redistribution in four industrialized countries: A comparative analysis. *Res Aging* 12(3):251–293
- Rossi PH (1955) *Why families move: A study in the social psychology of Urban residential mobility*. Free Press, Glencoe
- Rowles GD, Watkins JF (1993) Elderly migration and development in small communities. *Growth Change* 24:509–538
- Sastry ML (1992) Estimating the economic impacts of elderly migration: An input-output analysis. *Growth Change* 23(1):54–79
- Serow WJ (2003) Economic consequences of retiree concentrations: A review of North American studies. *Gerontologist* 43(6):897–903
- Serow WJ (1988) Why the elderly move: Cross-national comparisons. *Res Aging* 9(4):582–597
- Serow WJ, Haas WH (1992) Measuring the economic impact of retirement migration: The case of Western North Carolina. *J Appl Gerontol* 11(2):200–215
- Simonsen W, Robbins M (1996) Does it make any difference anymore? Competitive versus negotiated municipal bond issuance. *Public Adm Rev* 56(1):57–64
- Speare A Jr, Avery R, Lawton L (1991) Disability, residential mobility, and changes in living arrangements. *J Gerontol* 46(3):S133–S142
- Stallman JI, Deller SC, Shields M (1999) The economic and fiscal impact of aging retirees on a small rural region. *Gerontologist* 39(5):599–610
- Stallman JI, Siegel PB (1995) Attracting retirees as an economic development strategy: Looking into the future. *Econ Dev Q* 9(4):372–382
- Steinnes DN, Hogan TD (1992) Take the money and sun: Elderly migration as a consequence of gains in unaffordable housing markets. *J Gerontol* 47(4):S197–S203
- Stoller EP, Longino CF Jr (2001) Going home or leaving home? The impact of person and place ties on anticipated counterstream migration. *Gerontologist* 41:96–102
- Teaford, MH (1992) Predictors of older widows' intentions to move and actual relocation., Unpublished dissertation, The Ohio State University
- Van der Geest S, Mul A, Vermeulen H (2004) Linkages between migration and the care of frail older people: Observations from Greece, Ghana, and The Netherlands. *Aging Soc* 24:431–450
- Walters WH (2002) Place characteristics and later-life migration. *Res Aging* 24:243–277
- Warnes AM (1992) Migration and the life course. In: Champion T, Fielding T (eds) *Migration processes and patterns*. Belhaven Press, London
- Warnes AM, Law CM (1984) The elderly population of Great Britain: Locational trends and policy implications. *Transactions of the Institute of British Geographers, New Series*, 9(1):37–59
- Watkins JF (1999) Life course and spatial experience: A personal narrative approach in migration studies. In: Pandit K, Withers SD, *Migration and Restructuring in the United States*. Boulder, Rowman and Littlefield, CO, pp. 294–312
- Watkins JF (1989) Gender and race differentials in elderly migration. *Res Aging* 11(1):35–52
- Wiseman RF (1980) Why older people move. *Res Aging* 2:141–154
- Worobey JL, Angel RJ (1990) Functional capacity and living arrangements of unmarried elderly persons. *J Gerontol* 45(3):S95–S101
- Zimmerman RS, Jackson DJ, Longino CF Jr, Bradsher JE (1993) Interpersonal and economic resources as mediators of the effects of health decline on the geographic mobility of the elderly. *J Aging Health* (1):37–57

Chapter 15

International Retirement Migration

Tony (A.M.) Warnes

Themes and Scope of the Article

This chapter reviews a recent, still unusual but rapidly growing manifestation of affluence and the freer movement of capital and people around the world, international retirement migration (IRM). The phenomenon engages both theoretical and applied gerontological concerns. The migrants include some of the most “culturally innovative” members of the latest cohort of young elderly people, whose approach to old age is positive and developmental and may indicate more widely shared changes in attitudes and aspirations. Among the concerns, the welfare outcomes for the participants are none too clear, particularly the medium- to long-term implications for their access to informal and formal care and support. IRM also interests actuaries, demographers and human-services planners, because the flows have the potential to change a country’s age distribution and the international distribution of government spending on old-age income support, health-services and long-term care.

This chapter explicates international retirement migration for both social demographers and gerontologists. Its main features will first be defined and set in context. Comparable data from Germany, the United Kingdom and the United States are then reviewed, followed by attention to several distinctive types of older migrants and migrations, the characteristics of those who move and the immediate and extended personal and economic outcomes. Important aspects of the topic that have not yet attracted systematic stud-

ies will be identified and the chapter concludes with a discussion of the likely development of both IRM and an alternative pattern of residence, “transnationalism”. The chapter draws on the author’s long-standing interest in retirement migration, from research undertaken in southern Europe with Russell King and Allan Williams, from research conducted by colleagues in a European Scientific Network on the welfare of older migrants, and from more recent studies.

Concepts and Definitions

A phenomenon defined by three substantives, such as international retirement migration, has a good chance of being well defined by its name but how precisely depends upon the robustness of the terms. The meaning of “international” raises fewest ambiguities, although France does not regard migrations to and from its overseas *départements*, as in the Caribbean, as international moves, and a retirement move from the coterminous United States to Hawaii is not international. There are, by contrast, disparate and confusing meanings of both “retirement” and “migration”. Brief expositions of the two terms will introduce the core nature and the marginal characteristics of IRM.

Retirement

The term “retirement” has been a common-speech synonym for withdrawal for centuries. Contemporary academic accounts maintain, however, that when conceived as the structured exit from work at a stipulated age and as a normative life stage, retirement was created by late-

A.M. Warnes
Sheffield Institute for Studies on Ageing
University of Sheffield
Sheffield, UK
E-mail: a.warnes@sheffield.ac.uk

nineteenth and early-twentieth century social policy in the most advanced economies (broadly today's OECD member states). In these countries, state-funded or subsidized old-age benefits or pensions soon followed the introduction of compulsory state-funded education – both changes marking the transition from unbridled industrial capitalism to the modern welfare state. It is usual to credit the Prussian *Old-Age and Invalidity Insurance Law 1889* with the “invention” of state-constructed retirement, although the general use of 65 years as the eligibility age was not established until after 1945. In fact, the modern occupational sense of “retirement” has a much longer history: it was so used in 1648 by Oliver Cromwell in a letter to an army officer (see *Oxford English Dictionary online*) and by George Washington in his Farewell Address of 1796. In England, the first official superannuation fund began in 1712 and *The Superannuation Act 1859* introduced a uniform service-related pension for civil servants at 60 years of age (Arza and Johnson 2004: 2). The pertinent point is that both state old-age benefits and occupational (or employer-managed) pensions with a minimum age criterion create a difference between the administrative and life-stage transition senses of retirement. In other words, many people actually retire from work, or exit the labor force, before or after the age at which they are entitled to retirement pensions, which inevitably confuses the understanding of a “retirement migration”.

During the third quarter of the twentieth century, not earlier or since, 65 years was the age of retirement for a high percentage of the male labor force in OECD nations; only then did the administrative and life course transition senses of retirement closely correspond, for since the 1970s several social and labor-market changes have eroded the equivalence. Earlier retirement first became increasingly common but from the 1990s, legislative and fiscal changes have encouraged staying in the labor force to a greater age. By the early 2000s, the ages at which employees permanently exited the labor force were widely distributed.¹ Data from four major developed economies show that during the 1990s, the

annual rate of exit from employment rose with increasing age from around the age of 55 years to age 65 years (Burkhauser et al. 2004: Fig. 1). Among men, the rate exceeded 15 per cent at 59 years-of-age in Germany and Canada, at 61 years in Great Britain and at 62 years in the United States. At greater ages, the annual rate of exits rose steeply. At 65 years-of-age, it was around 65 per cent in Canada, 50 per cent in Germany and Great Britain and 33 per cent in the United States.

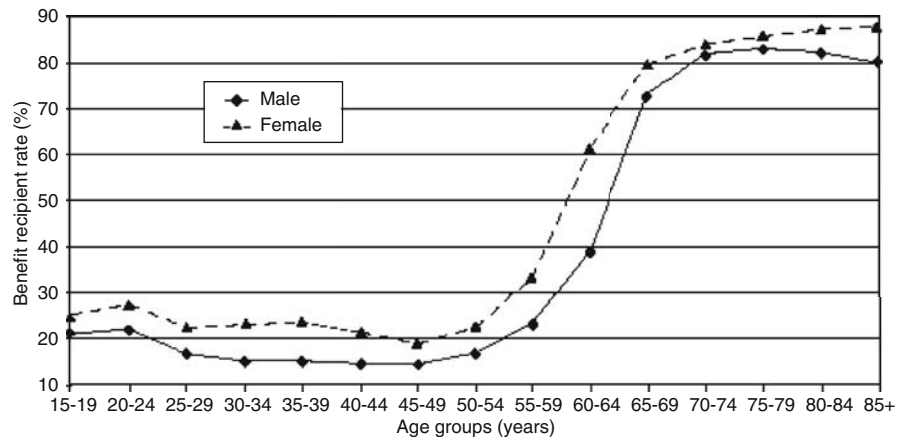
A less usual source provides even clearer evidence of the weak tie to any chronological age of the life-stage transition from “work” to “dependency”. It is the age-schedule of the rate of being a recipient of state income-support in Australia in 2001 (Tefsfaghiorghis 2004: Fig. 2). At no adult age did this dependency rate fall below 14 per cent for men and 18 per cent for women, but from around age 45 years there was a well-ordered sinusoidal rise, to a plateau rate of around 85 per cent at 75 years – the “dependency transition” was therefore spread over 30 years of Australians' lives (Fig. 15.1). The pertinence here is that although for most long-term employees the age of their retirement is clear, in the entire population no single chronological age is normal for the life transition. One consequence is that people who migrate at the time of their retirement are immensely diverse. Many younger retirees are in good health and have developmental ambitions; but many who make the transition in their late sixties and the few that are older are much more likely to have poor health, functional limitations and low income and to have lost a spouse or partner. Some may indeed migrate to access informal care and support. International retirement migration therefore involves a much more diverse population and a wider range of motivations and types than suggested by the “go-go” stereotype of the fully-fit “third-age” couple that is flaunted by “retirement living” advertising (McHugh 2003). Another implication of the wide age range of retirement and retirement moves is that it becomes very difficult to compile consistent time series and comparative statistics from standard sources.

¹ Establishing the distribution of the ages of “final” exits from the labor force is not in fact straightforward, for logical and practical data collection reasons (e.g., an exit at 55 years may be expected to be final but later reversed). Most of the considerable analysis of the distribution draws from cross-sectional survey or employment data to estimate age schedules of rates of participation in the labor force and, from those, the probabilities of labor-force exits in one year.

Migration

Of the three defining terms of IRM, migration is the most elusive of firm definition. Not only do technical and common-speech meanings diverge, contrasting

Fig. 15.1 Percentage of population receiving social security benefits by age and gender, Australia 2001



Source: Tesfaghiorghis 2004, Figure 2.

definitions are used by different academic disciplines. William Petersen's excellent demography textbook summarized the difficulties very well. "If we define migration as 'the permanent movement of persons or groups over a significant distance', some of the key terms (e.g., permanent, significant) are ambiguous and in practice arbitrary. ... A farmer who goes to the nearest town to buy a suit, we feel, is not a migrant. A person who goes to another country and settles there for the rest of his life, on the other hand, is a migrant. But between these two extremes lies a bewildering array of intermediate instances; and such criteria as distance, duration of stay, and importance of purpose do not clarify the concept entirely" (Petersen 1975: 41). The inclusive definition, "a change in principal residence from one location to another", is favored by migration analysts but not accepted by all social scientists. It includes local accommodation adjustment moves that demographers and sociologists call "residential mobility" but because no single distance distinguishes a local residential adjustment from a "total displacement" migration, long time series and comparative analyses are confused if the distinction is made.

The inclusive definition also differs from common meanings. In tabloid journalism and policy discourses, a "migrant" is frequently synonymous with a recently arrived foreigner (by birth and culture). A similar usage of "migrant" that specifically refers to being foreign born is a legally recognized civil status in some European countries, including France and Germany. It is now frequently asserted, at least in Europe, that "increased migration is one of the most visible and significant aspects of globalization [and that] growing

numbers of people move within countries and across borders, looking for better employment opportunities and better lifestyles" (Tacoli and Okali 2001: 1). The reasoning is sound but when the assertions extend to the notion that migration has never been greater, little historical awareness is displayed. Mass, long-distance migrations have occurred in many eras (Castles et al. 2003; Eltis 2002; International Organization for Migration 2005). The scale of the migration from West Africa to the Caribbean and the southern United States during the eighteenth and nineteenth centuries and of that from Europe to North America from the 1840s to 1910s, have not yet been surpassed. There are, however, shared technical and colloquial meanings. In every large country, long distance, permanent changes of address from one region to another are called migrations and phrases such as "rural-urban migration" and "migration to the east, west, north or south" are widely understood.

Apart from the definitional problems, the understanding of IRM is confused by biased evidence and misattributions – "false consciousness" to Marxist exegetes. The attention of journalists and researchers is drawn to the more unusual forms, which are visible and available for study but unrepresentative. In Europe, for example, the current understanding has been strongly influenced by the marked concentrations of northern country nationals in certain Mediterranean resorts. As we shall see, however, there are many more British retirees in Germany than in Spain and there are many more German pensioners in Austria and Switzerland than in Iberia. More northern European retirees move to live near relatives scattered across North America and Australasia than move to European holiday coasts.

Misattributions arise from the fine gradations between long-stay (or residential) tourists, seasonal migrants, those with two or more homes in different countries and “total displacement” migrants. It is impossible to distinguish by superficial appearance the international retirement migrant from a visitor, seasonal resident or temporary resident. In the winter there are large concentrations of older Canadians in Florida and Americans in Baja California Sur, Mexico, but only a minority are permanent residents. We will return to the confounding effects of new forms of multi-national (or transnational) residence and activity patterns later in the article. Sufficient definitional intricacies have however been introduced to provide a foundation understanding of international retirement migrants. We turn to its origins and current extent.

The Development of International Retirement Migration

The development and general features of within-country retirement migration have been described many times (e.g., Longino 1995; Longino and Warnes 2005; Walters 2002; Warnes 1993). It first became prominent early in the twentieth century. By the 1930s, concentrations of ex-metropolitan retired people had formed in coastal towns and adjacent rural areas in England, Wales and France, with more restricted developments on the Belgian, northern Italian and northern Spanish coasts. There were equivalent developments in the United States on the coasts of New Jersey, Connecticut and the New England States and more innovative, distant retiree concentrations in Florida and California. Most of the favored settlements were “middle class” coastal resorts that developed during the railway era. Mass car-ownership enabled the proliferation and wider dispersal of retirement settlements, from the 1940s in the United States and from the late 1950s in England, France and Australia.

The first resorts to be associated with *international* retirement moves were almost certainly Cannes and Nice on the French Riviera. As many local websites relate, Lord Brougham, who had been the British Chancellor of the Exchequer, established Cannes’ reputation as a health resort among the British aristocracy in 1834, after which fashionable gentry from Queen Victoria’s court visited for holidays. The trend

spread to the French establishment and the railway increased the town’s accessibility. Some undoubtedly took up residence for “retirement” but the relative importance of the function is difficult to gauge. Different precursors arose after the First World War. A few creative artists, including members of the Bloomsbury set, began to holiday and party in exceedingly remote “authentic” southern European villages and fishing ports, as in Sardinia and the Alpujarras hills of Andalusia, and some stayed into old age (Brenan 1957; Lawrence 1923). Fashionable holiday destinations, whether Cannes in the nineteenth century or Indian Ocean islands today, attract rich holidaymakers and property developers, speculators and investors, among whom a small minority acquire properties for their own retirement. Realtors then promote the location as “highly desirable for retirement” and the presence of older affluent holidaymakers gives the impression that the resort is a retirement destination but often very few have actually made it their principal home.

International retirement migrations became numerous from the 1960s, as an indirect result of the new forms and destinations of commercialized holiday-making enabled by large-capacity jet planes. One of the first explicit promotions was by the newly independent Government of Malta, which offered a low personal tax rate for British citizens who retired to the country – partly to induce British military personnel who had been based on the island to stay (Warnes and Patterson 1998). More usually, however, the new mass tourism created transport links, hotels, housing, a service infrastructure and recreational facilities, all of which were under-utilized for much of the year. Marketing a resort for off-season and all-year residence by retirees is a commercial complement to the holiday industry (Gustafson 2002).

The most apparent early manifestations were retirement-housing developments on the coasts and archipelagos of Spain, and northern Europeans buying houses for retirement in attractive rural areas of southern Europe, particularly in the south of France and in Tuscany and Umbria, Italy. The favored destinations have gradually spread within countries and globally. Investors now assiduously seek freehold land on the Black Sea coast and in the South Pacific on which to build vacation or retirement properties at a fraction of the cost of comparable real estate in Hawaii or the Caribbean. In India, “there has been a virtual stampede by Gujarati and Punjabi (return migrants) for holiday

and retirement homes in Goa. ...Some 2,000 foreigners, a large number European pensioners and Russian property hunters, have made Goa their winter home, the police estimate. British media reports ... suggest some 5,000 Britons may have bought a retirement home here" (*Deccan Herald*, 20 August 2006, cited by *Goan Voice UK*, 34 (4). See <http://www.goanvoice.org.uk/newsletter/2006/Aug/issue4/>).

Studies of older international migrants only began in the 1990s but are already diverse. The earliest contributions analyzed departure statistics and resident registers (Bratsberg and Terrell 1996; Mazorra 1991; Warnes 1991). Researchers then obtained funds to conduct surveys of fellow-nationals in the most favored destination areas (Breuer 2003; Casado-Díaz et al. 2004; Friedrich and Kaiser 2002; Helset et al. 2005; Huber and O'Reilly 2004; King et al. 2000). The papers in two journal special issues, *Ageing & Society* (24[3], May 2004) and the *Journal of Ethnic and Migration Studies* (32[8], September 2006) and the final report of the European Science Foundation scientific network (Warnes 2004), reviewed and exemplified the field (Warnes et al. 2004; Warnes and Williams 2006). The first substantial studies of retirement migration to foreign countries by citizens of the United States have recently been published (Banks 2004; Migration Policy Institute 2006; Sunil, Rojas and Bradley 2007); there is an impressive collection by Spanish researchers (e.g., Rodriguez, Casado-Díaz and Huber 2006); and the first signs of a research literature on the phenomenon in Turkey, South East Asia and Australasia (Tamer Görer et al. 2006; Ip et al. 2007; Shinozaki 2006).

Current International Flows of Older Migrants

Given both the elusive definition of an international retirement migrant and the many imperfections of migration data, the global distribution of their flows is only partially known. This is not the place for a full discussion of the capacities and limitations of standard migration sources (for which see Poulain, Perrin and Singleton 2006) but the main points should be understood. Most national censuses reliably record the number and provenance of those who have taken up residence in a country since the previous census but generally record nothing of the characteristics of the migration (e.g.,

who moved together or the motivations). Continuous registers of residents (as maintained in several Nordic countries) and many local property tax, electoral (voter) or resident rolls record the age, citizenship and resident status of householders. Embassies commonly maintain lists of the nationals that have registered as resident in a country but these are unreliable because no distinction is made between short and long stays, the reasons for residence are not recorded and few de-register when they leave. A systematic interrogation of such sources to estimate the number of US retirees resident in Mexico is well described in Migration Policy Institute (2006). The most revealing data on the global patterns of international migrations are United Kingdom, United States and German social security client statistics. Although only age, gender, type of benefit and country of residence are generally released for each client, so only limited social descriptions and analyzes are possible, long time series can be compiled of the number and expenditure in each foreign country. The following sections summarize the data, after which the underlying social and migration processes will be discussed.

The Dispersal of State Pensioners from the United Kingdom

The UK Department for Work and Pensions Overseas Division in 1999 and 2006 kindly made available statistics from the social security client register (in 2006 from a five per cent sample). The number of UK State Pensions paid to overseas addresses increased from 679,800 in March 1995 to 996,100 in March 2005 (and 1,025,600 on 7th January 2006), an annual growth rate of 3.9 per cent.² Reflecting the gender difference in the eligibility age (60 years for women and 65 for men), the majority (61.8 per cent) of the beneficiaries were women. Overseas residents are a rising percentage of all UK State Pensioners (6.6 per cent in 1995 and 8.6 per cent in 2005). The distribution is truly global but highly concentrated in a few countries. In 2005, one-quarter were resident in Australia, nearly one-fifth in Canada, one-sixth in the United

² These figures have been collated from a five per cent sample of the entire caseload by the Department for Work and Pensions Overseas Division. Data for rates of change over the 11 years are restricted to 36 countries with more than 1,000 beneficiaries in 2005. The analysis and interpretations are entirely the author's.

States and over one-tenth in the Republic of Ireland. Those four countries accounted for exactly two-thirds of the total. There were more than 10,000 recipients in 11 countries. Among the 36 destination countries with at least 1,000 beneficiaries in 2005, the highest average annual growth rates over the previous 10 years were in Nigeria (22.6 per cent), Sweden (15.4 per cent), France (9.8 per cent), Spain (9.8 per cent), Greece (9.2 per cent), Norway (9.2 per cent), Trini-

dad and Tobago (9.2 per cent), Cyprus (8.1 per cent) and Denmark (7.9 per cent) (see Table 15.1). Four countries had sustained decreases: Zimbabwe (−4.6 per cent), Poland (−3.1 per cent), Pakistan (−2.1 per cent) and Bangladesh (−0.7 per cent). The number of UK State Pensioners in Zimbabwe increased between 1995 and 1997, changed little for three years but between 2000 and 2005 fell from 5,000 to 3,200 (annual change, −9.1 per cent).

Table 15.1 Number and sex ratio of UK State Pensioners resident abroad in March 2005 and growth rates since March 1995, 36 countries with at least 1,000 clients

Country	2005 000s	2005 per cent	Change 1995–2005 per cent	Av. annual change Per cent	Rank	Fem : male ratio 2005
1 Australia	239.7	24.1	38.2	3.3	22	1.42
2 Canada	149.9	15.0	22.2	2.0	28	1.58
3 USA	123.9	12.4	44.7	3.8	17	1.88
4 Ireland	97.7	9.8	37.2	3.2	24	1.70
5 Spain	70.0	7.0	153.6	9.8	3	1.52
6 New Zealand	43.9	4.4	45.8	3.8	18	1.31
7 South Africa	37.6	3.8	19.0	1.8	29	1.59
8 Germany	32.0	3.2	61.6	4.9	15	2.33
9 Italy	31.4	3.2	79.4	6.0	13	1.45
10 France	30.5	3.1	154.2	9.8	4	1.44
11 Jamaica	21.7	2.2	19.9	1.8	30	1.33
12 Cyprus	9.8	1.0	117.8	8.1	8	1.45
13 Netherlands	7.1	0.7	42.0	3.6	20	1.77
14 Portugal	5.7	0.6	103.6	7.4	11	1.38
15 Pakistan	5.2	0.5	−18.8	−2.1	34	1.36
16 Austria	4.7	0.5	27.0	2.4	26	3.18
17 Barbados	4.6	0.5	109.1	7.7	10	1.04
18 Switzerland	4.6	0.5	84.0	6.3	12	1.71
19 Belgium	4.4	0.4	4.8	0.5	32	1.59
20 India	4.2	0.4	20.0	1.8	31	1.00
21 Israel	3.6	0.4	38.5	3.3	23	2.00
22 Malta	3.5	0.4	59.1	4.8	16	1.33
23 Zimbabwe	3.2	0.3	−37.3	−4.6	36	2.10
24 Greece	2.9	0.3	141.7	9.2	5	1.42
25 Republic of Yemen	2.8	0.3	40.0	3.4	21	2.50
26 Bangladesh	2.7	0.3	−6.9	−0.7	33	2.38
27 Nigeria	2.3	0.2	666.7	22.6	1	0.92
28 Sweden	2.1	0.2	320.0	15.4	2	1.33
29 Poland	1.6	0.2	−27.3	−3.1	35	3.00
30 Denmark	1.5	0.2	114.3	7.9	9	1.50
31 St Lucia	1.4	0.1	27.3	2.4	27	1.17
32 Hong Kong	1.3	0.1	62.5	5.0	14	0.86
33 Dominica	1.3	0.1	44.4	3.8	19	0.63
34 Grenada	1.3	0.1	30.0	2.7	25	1.17
35 Norway	1.2	0.1	140.0	9.2	6	2.00
36 Trinidad and Tobago	1.2	0.1	140.0	9.2	7	1.40

Notes: The “share” is the percentage of all customers abroad. The “growth rate” is the average annual compound growth rate over the 10 years. The estimates are from a five per cent sample of the client roll.

Source: Department for Work and Pensions, International Pensions Centre, Newcastle-upon-Tyne, personal communication.

Table 15.1 also shows the sex ratio of UK State Pensioners by country in 2005. Given women's younger eligibility age and greater longevity than men, it is not surprising that females predominate. The variation in the female-to-male ratio among the 36 countries was considerable, however, from 0.63 in Dominica, 0.86 in Hong Kong and 0.92 in Nigeria, to 3.18 in Austria, 3.00 in Poland and 2.33 in Germany. More extreme ratios were found in countries with fewer than 1,000 beneficiaries, from 0.29 in Thailand (i.e., 3.5 males for every female) to 5.00 in Finland. The variations have disparate causes: differences in the age, gender balance and chronology of the migrations, and gender differences in subsequent returns to the UK and in survival. Social security statistics provide no direct information about the relative frequency of different motivations or the prior connections of the migrants, or about underlying processes. In some countries, however, information about the sex ratio can be combined with other information about the migration or the foreign retired population to support an explanatory proposition.

An extreme sex ratio in the retired population resident in a foreign country can indicate various attributes of the migrants, the migration flows and the destination countries. For return migrants, it suggests strong sex selection in the original labor migrant flow, as from the Caribbean and Hong Kong to Europe and to North America during the 1960s. For family-oriented migrants, it suggests a high representation of dual-nationality couples with men and women having unequal probabilities of being citizens and social security beneficiaries. This is probably the mechanism that explains the high female ratios in the British pensioner population in Nordic countries, Germany and Austria. High female ratios are also likely in a foreign country where the foreign retired population is no longer being replenished by new migrations, for it will have a high average age and the associated preponderance of women. As we shall see, there is also research evidence that the exceptional preponderance of men among British, German and US retirees living in Thailand is explained by the opportunities for

Table 15.2 Thousands of UK State Pensioners in four country groups, the USA and Ireland: growth statistics and the sex ratio in March 2005 and rates of increase 1995–2005

Measure	Country group					
	Den, Nor, Swe.	Southern Europe	Caribbean	Aus, Can, RoSA, NZ	USA	Ireland
1995						
Both sexes	1.7	67.8	23.8	357.9	85.6	71.2
Men	(0.5)	(27.2)	(10.3)	(139.6)	(29.5)	(26.4)
Women	(1.1)	(40.5)	(13.6)	(218.3)	(56.2)	(44.7)
2000						
Both sexes	2.9	95.6	30.2	419.6	107	84.1
Men	(0.9)	(38.5)	(13.1)	(166.3)	(36.1)	(31.2)
Women	(1.9)	(56.9)	(17)	(253.3)	(70.9)	(52.9)
2005						
Both sexes	4.8	153.8	31.5	471.1	123.9	97.7
Men	(1.9)	(62.2)	(14.1)	(190.4)	(43)	(36.2)
Women	(2.9)	(91.6)	(17.4)	(280.8)	(80.9)	(61.5)
Increase 1995–2005 (%)	182.4	126.8	32.4	31.6	44.7	37.2
Mean annual per cent increase	10.9	8.5	2.8	2.8	3.8	3.2
Female: male ratio						
1995	2.20	1.49	1.32	1.56	1.91	1.69
2000	2.11	1.48	1.30	1.52	1.96	1.70
2005	1.53	1.47	1.23	1.47	1.88	1.70

Notes: The country groups in the first four columns respectively are: A. Denmark, Norway and Sweden. B. Cyprus, France, Greece, Italy, Malta, Portugal and Spain. C. Barbados, Dominica Republic, Grenada, Jamaica, St Lucia and Trinidad and Tobago. D. Australia, Canada, New Zealand and South Africa. The tabulation includes only countries with at least 1,000 customers in 2005 and the estimates are from a five per cent sample of the client roll. The female to male ratio among all overseas beneficiaries in 2005 was 1.56.

Source: UK Department for Work and Pensions, International Pensions Centre, Newcastle-upon-Tyne, personal communication.

forming new partnerships or sexual adventures with young women.

A previous analysis of trends during the 1990s in the world distribution found contrasting growth rates in different types of destination countries (Warnes 2001). There were very high rates of growth, if from very low bases, to several Nordic countries. Among the most popular destinations, the rates of growth were high to Mediterranean countries and low to Australia, Canada, New Zealand and South Africa. That analysis is brought forward in Table 15.2, which identifies four distinctive country groups. The fastest annual rate of growth (10.9 per cent) was to Denmark, Norway and Sweden – this cluster had an unusually high female to male ratio of pensioners in 1995 (2.20), but the distinctiveness had disappeared by 2005 when the ratio was less than the overall average (1.56). There was also a very high annual growth rate (8.5 per cent) to the southern European countries that are popular holiday and amenity-seeking retirement and winter destinations for northern Europeans. Throughout the survey period,

the female to male ratio in these countries was below average. In contrast, there was a relatively low rate of increase (2.8 per cent) of British resident pensioners in Australia, Canada, New Zealand and South Africa, and the growth rate (2.8 per cent) for six Caribbean countries was also below average. The growth rates and change over time for selected countries are plotted on Fig. 15.2.

Five-year age-group breakdowns (with the unusual closing categories 80–99 and 100 or more years) have been provided for 31 countries. Average ages have been estimated by assuming the following mean ages for each successive age group (62 for 60–64 years (women only), then 67, 72, 77, 86 and 103 years). The male and female average ages were very similar but the means varied markedly, from 69.9 years in Nigeria to an exceptional 79.8 years in Poland (Fig. 15.3). In general, higher average ages characterized countries with former colonial, military and wartime associations (e.g., the Yemen Republic, where Aden, a strategic naval base and re-fueling port, was admin-

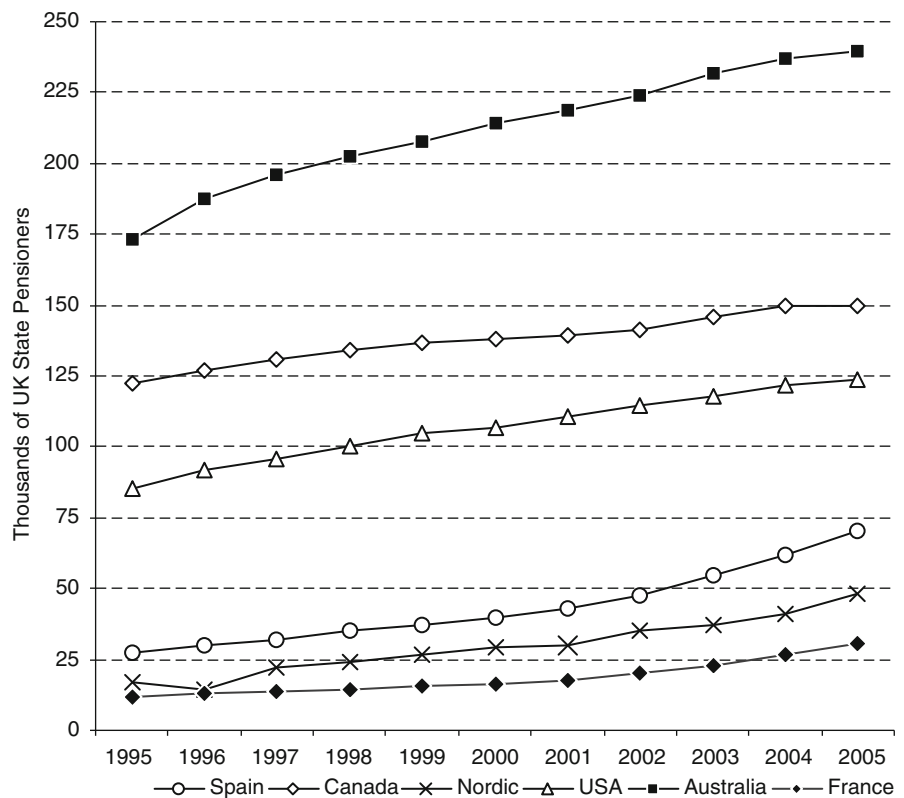
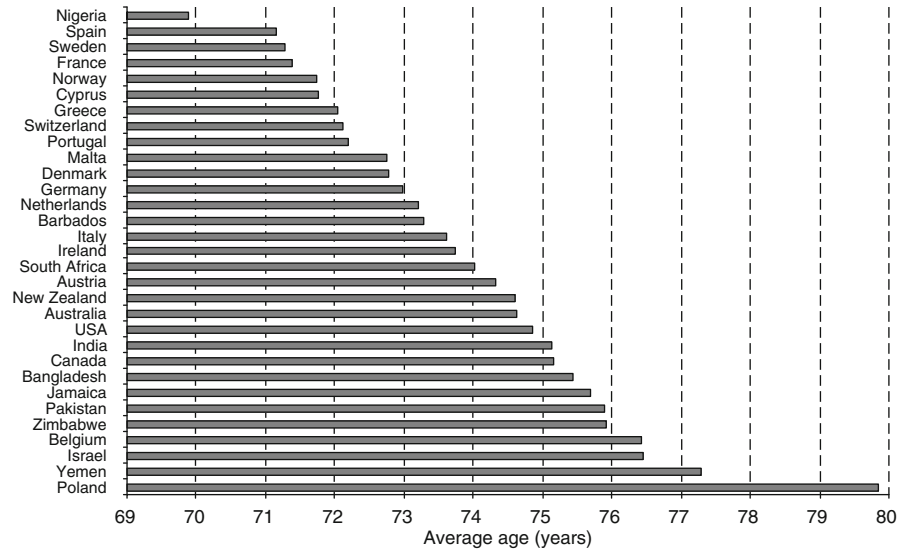


Fig. 15.2 The increase of British State Pensioners in selected countries, 1995–2005

Note: The Nordic countries are Denmark, Norway and Sweden: the actual numbers in these three countries were 0.1 of the presented series.

Fig. 15.3 The average age of UK State Pensioners in selected foreign countries, 2005



istered by the British until 1967) and lower average ages characterized southern European countries, Norway and Nigeria.

The expenditure by the British state to beneficiaries living in other countries in calendar year 2005 was £1,986 million on State Pensions and £23 million on Widows' Benefits – exceeding two billion pounds (approximately US \$ 1.15 billion). The estimated *per capita* State Pension payment was much less than the full benefit (in 2005 around £4,400 for a single person and £7,000 for a married couple) and varied considerably by country. Table 15.3 presents the average payments in countries with more than 4,000 recipients (i.e., 200 clients in the five per cent sample). The range was from £3,792 in Cyprus to £1,210 in Austria. It seems likely that the higher the average value of the benefit paid in a country, the more recent has been the migration from Britain. In general, the payments were low in British Commonwealth countries, notably Canada, New Zealand and Australia, and in contrast high in southern European and Caribbean countries. Another

influence is whether a country has a social security agreement with the United Kingdom, by which benefits to overseas customers are up-rated with inflation. The fact that this has not applied to British pensioners in the major Commonwealth destination countries has been a long-standing grievance. Associations of British pensioners in Australia, Canada, New Zealand and South Africa, all affiliated to the *World Alliance of British Expatriate Pensioners*, lobby hard and mount legal actions in London to seek the same benefits as received by pensioners resident in the UK (see <http://wabep0.tripod.com/>).

The exodus of British pensioners is considerable and probably unmatched from any other country. In 2005, 8.6 per cent of the UK older population resided overseas. Projecting the 3.93 per cent annual rate of growth during 2002–05, by 2015 the number will exceed 1.5 million and constitute around 11.2 per cent of the older population. The trend will be bolstered by the growing enthusiasm among the British for buying property abroad, particularly in France

Table 15.3 Average benefit payment (pounds sterling) to a UK State Pensioner resident abroad in calendar year 2005 by country

Cyprus	3,792	Portugal	3,267	South Africa	1,796	Netherlands	1,588
Jamaica	3,455	Ireland	2,302	Belgium	1,739	Australia	1,545
Barbados	3,446	Switzerland	2,044	Pakistan	1,699	Germany	1,500
Spain	3,352	USA	1,928	India	1,688	Canada	1,378
France	3,317	Italy	1,866	New Zealand	1,662	Austria	1,210

Source: Same as Table 15.2.

and southern Europe and by the surge of European personal, work and commercial contacts encouraged by very low cost flights. It was apparent during the 1980s and 1990s that the rate of growth is sensitive to house-price movements in Britain (Warnes 2001). Late in 2007, there was clear evidence that the “credit crunch” spilling over from the sub-prime mortgage-funding crisis in the United States was depressing UK property prices. The growth of IRM is likely to slow over the next two years.

German Social Security Clients in Foreign Countries

The analogous social security statistics from Germany are more difficult to interpret than the British. Although a single Social Security Agency (*Deutsche Rentenversicherung*: DRV) has replaced several formerly independent social insurance organizations for different occupational sectors, it is still the case that civil servants (including teachers and police officers) belong to a different system and that the “learned professions” can opt out of the state system and join private-managed pensions schemes. Other complications, particularly when examining change over time, have been the unification of Germany, the opening of the borders between eastern and western Europe, and the accession to the European Union of East European countries. Most importantly, however, “the new citizenship legislation approved by the German parliament in 1999 ... went a long way to abolish the principle of ethnic descent hitherto intrinsic to the German concept of the nation [and citizenship]” (Castles and Davidson 2000: 93) and considerably raised the ability of a long-term labor migrant to become naturalized. Having citizenship enables a labor migrant to return to their native country with a German pension and to access certain social and health-care benefits if they return to Germany. Between 1993 and 2002, nearly half-a-million Turkish-born residents naturalized. Many then returned to Turkey where they re-acquired citizenship, by which they circumvented Germany’s continuing non-acceptance of dual citizenship (Anil 2004: 11). Further reforms have been implemented and others were announced in 2007. It should be remembered that “non-national residents in Germany enjoy broad

health and social services coverage, so they are not completely dependent on German citizenship to gain access to public goods” (Leise 2007, unpaginated). As for the citizens and labor migrants in all countries, however, many of these benefits are not portable – as a pension is – to other welfare jurisdictions.

Some facts about the international dispersal of German pensioners are, however, clear. At the end of 2005, 15.6 million German citizens received old-age benefits from the DRV but only 0.7 per cent lived in foreign countries (Table 15.4). In addition, however, 1.3 million non-citizens were also recipients and 65 per cent lived in other countries. One-in-six German-citizen pensioners living abroad were in the United States, 13 per cent in Switzerland and around seven to eight per cent in each of Austria, Spain, Canada and France. These six countries accounted for 61 per cent of the total. The distribution of non-citizen beneficiaries differed markedly, with 22.5 per cent in Italy and 14 per cent in Spain, clearly designating the two major southern European labor-migrant groups of the 1950s and 1960s. Nearly one-in-ten were in the United States and more than five per cent in Austria, Canada and Greece. These six countries accounted for 59 per cent of the total living outside Germany. The representation of German citizens among German pensioners in different countries varied immensely, from less than one per cent in several Balkan countries, to 88 per cent in South Africa and Thailand and more than three-quarters in Argentina and Brazil.

The Dispersion of Social Security Pensioners from the United States

Consistent tables on the number of “retired worker” and “widow(er)” beneficiaries of US Social Security resident overseas have been published for many years. Their interpretation is not straightforward, however, partly because they focus on the types of benefit rather than the age of the recipients and partly because “since the late 1970s, the United States has established a network of bilateral Social Security agreements that coordinate its Social Security Program with the comparable programs of other countries. International Social Security agreements, often called “totalization agreements”, have two main purposes. First, they eliminate dual social security

Table 15.4 Deutsche Rentenversicherung [German Social Security] old-age benefits recipients resident in foreign countries on 31 December 2005, and change since 1996

	Beneficiaries in foreign countries in 1996			Beneficiaries in foreign countries in 2005						Growth ¹ 1996– 2005		
	German citizens			Other nationals			All					
	Number	Per cent	Per cent	Number	Per cent	m:f	Number	Per cent	m:f		Number	Per cent
USA	14,280	17.7	16.7	19,290	16.7	0.7	80,646	9.5	0.7	99,936	19.3	24.1
Switzerland	6,972	8.7	13.0	15,095	13.0	1.1	20,052	2.4	0.8	35,147	42.9	19.7
Austria	8,153	10.1	8.4	9,737	8.4	0.9	51,276	6.0	1.0	61,013	16.0	25.1
Spain	3,301	4.1	7.8	9,000	7.8	1.0	119,099	14.0	3.1	128,099	7.0	50.2
Canada	6,565	8.2	7.5	8,693	7.5	0.8	53,717	6.3	1.2	62,410	13.9	28.4
France	5,876	7.3	7.2	8,324	7.2	1.2	29,354	3.5	1.1	37,678	22.1	22.9
Australia	3,582	4.5	5.2	6,057	5.2	1.3	18,047	2.1	1.1	24,104	25.1	23.6
UK	3,932	4.9	4.1	4,756	4.1	0.6	12,662	1.5	0.5	17,418	27.3	18.0
South Africa	2,664	3.3	3.6	4,214	3.6	1.5	595	0.1	1.4	4,809	87.6	6.8
Netherlands	2,823	3.5	3.3	3,857	3.3	1.0	28,828	3.4	2.5	32,685	11.8	31.3
Italy	1,933	2.4	2.9	3,326	2.9	0.4	191,202	22.5	3.9	194,528	1.7	66.9
Belgium	2,163	2.7	2.3	2,702	2.3	1.1	25,491	3.0	2.3	28,193	9.6	33.0
Brazil	1,803	2.2	1.8	2,043	1.8	1.8	485	0.1	1.0	2,528	80.8	3.8
Sweden	766	1.0	1.7	1,919	1.7	1.2	6,220	0.7	0.9	8,139	23.6	30.0
Argentina	2,227	2.8	1.3	1,548	1.3	1.0	441	0.1	0.9	1,989	77.8	-1.2
Greece	370	0.5	0.7	847	0.7	0.6	56,343	6.6	1.6	57,190	1.5	75.1
Denmark	271	0.3	0.7	792	0.7	1.0	1,514	0.2	0.9	2,306	34.3	26.9
Israel	2,753	3.4	0.7	770	0.7	0.7	24,333	2.9	0.9	25,103	3.1	27.8
Thailand	n.d.		0.6	657	0.6	18.3	89	0.0	5.4	746	88.1	n.d.
Portugal	245	0.3	0.5	616	0.5	1.2	8,629	1.0	2.4	9,245	6.7	49.7
Turkey	134	0.2	0.3	402	0.3	0.6	15,044	1.8	6.1	15,446	2.6	69.5
Slovenia	132	0.2	0.2	283	0.2	1.1	8,454	1.0	2.0	8,737	3.2	59.3
Croatia	205	0.3	0.2	248	0.2	1.1	41,638	4.9	2.0	41,886	0.6	80.6
Serbia and Montenegro	n.d.		0.1	93	0.1	1.3	23,310	2.7	2.5	23,403	0.4	n.d.
Bosnia-Herzegovina	25	0.0	0.0	20	0.0	3.0	15,768	1.9	7.1	15,788	0.1	104.7
Macedonia	18	0.0	0.0	9	0.0	1.3	5,433	0.6	16.4	5,442	0.2	88.6
All countries	80,457	100.0	100.0	115,768	100.0		848,529	100.0		964,297	12.0	31.8
Resident in Germany	12,865,998			15,510,637			455,784			15,966,421	97.1	2.4
Total	12,946,455			15,626,405			1,304,313			16,930,718	92.3	3.0
Percentage abroad	0.6			0.7			65.1			5.7		

Note: n.d., no data. m:f, male to female ratio. ¹ Average annual growth rate 1996–2005.

Source: Deutsche Rentenversicherung 2006. *Rentenzahlbeiträge RTBN 96, Auslandsrenten an Deutsche, Rentenbestand am 31.12.2005*, Table 918.00 G RV. Data kindly acquired by Claudia Kaiser of the Martin Luther University, Halle.

Table 15.5 Recipients of United States Social Security Retirement Benefits (RB) and Widow(er) Benefits (WB) resident in foreign countries in December 2005 and rates of change since 1997

Country of residence	1997				2005				1997–2005	
	RB	WB	RB+WB	Per cent	RB	WB	RB+WB	Per cent	Per cent ¹	Annual per cent ²
Canada	48,808	16,087	64,895	22.8	59,022	18,393	77,415	22.6	19.3	2.2
Mexico	23,947	11,347	35,294	12.4	22,973	12,395	35,368	10.3	0.2	0.0
WItaly	19,960	8,443	28,403	10.0	20,010	7,378	27,388	8.0	-3.6	-0.5
Germany	13,633	4,094	17,727	6.2	20,837	5,203	26,040	7.6	46.9	4.9
United Kingdom	14,436	3,748	18,184	6.4	18,884	4,543	23,427	6.8	28.8	3.2
Greece	10,609	4,593	15,202	5.3	13,416	4,297	17,713	5.2	16.5	1.9
Philippines	7,073	5,886	12,959	4.6	9,165	4,985	14,150	4.1	9.2	1.1
Portugal	7,057	1,507	8,564	3.0	8,243	1,543	9,786	2.9	14.3	1.7
France	5,445	1,220	6,665	2.3	6,930	1,608	8,538	2.5	28.1	3.1
Spain	4,524	1,729	6,253	2.2	5,817	1,928	7,745	2.3	23.9	2.7
Ireland	4,644	961	5,605	2.0	5,738	1,136	6,874	2.0	22.6	2.6
Israel	4,420	1,348	5,768	2.0	4,879	1,323	6,202	1.8	7.5	0.9
Japan	2,080	1,592	3,672	1.3	3,980	1,859	5,839	1.7	59.0	6.0
Australia	2,360	702	3,062	1.1	4,310	935	5,245	1.5	71.3	7.0
Switzerland	3,092	515	3,607	1.3	4,367	699	5,066	1.5	40.4	4.3
Norway	3,079	1,124	4,203	1.5	3,820	1,192	5,012	1.5	19.2	2.2
Dominican Republic	2,851	395	3,246	1.1	4,270	439	4,709	1.4	45.1	4.8
Poland	1,653	685	2,338	0.8	3,607	730	4,337	1.3	85.5	8.0
Netherlands	1,827	519	2,346	0.8	2,798	625	3,423	1.0	45.9	4.8
Costa Rica	1,532	248	1,780	0.6	2,418	354	2,772	0.8	55.7	5.7
Colombia	1,491	239	1,730	0.6	2,427	331	2,758	0.8	59.4	6.0
Sweden	1,685	458	2,143	0.8	2,287	411	2,698	0.8	25.9	2.9
Argentina	1,651	450	2,101	0.7	2,052	550	2,602	0.8	23.8	2.7
Jamaica	2,015	220	2,235	0.8	2,182	213	2,395	0.7	7.2	0.9
Austria	1,306	375	1,681	0.6	1,559	414	1,973	0.6	17.4	2.0
Ecuador	1,384	185	1,569	0.6	1,736	220	1,956	0.6	24.7	2.8
Hungary	989	149	1,138	0.4	1,436	203	1,639	0.5	44.0	4.7
Brazil	959	315	1,274	0.4	1,171	383	1,554	0.5	22.0	2.5
Belgium	872	246	1,118	0.4	1,062	286	1,348	0.4	20.6	2.4
Thailand	374	23	397	0.1	1,118	87	1,205	0.4	203.5	14.9
All foreign countries	210,558	74,047	284,605		263,387	78,922	342,309		20.3	2.3

Notes: ¹ Percentage change 1997–2005. ² Average annual rate of change, 1997–2005.

Source: US Social Security Administration 1998 and 2006, Table 5.J11.

taxation, as when a worker from one country works in another country and is required to pay social security taxes to both countries on the same earnings. Second, the agreements help fill gaps in benefit protection for workers who have divided their careers between the United States and another country. In addition to providing better Social Security coverage for active workers, international social security agreements help assure continuity of benefit protection for persons who have acquired social security

credits under the system of the United States and the system of another country. Workers who have divided their careers between the United States and a foreign country sometimes fail to qualify for retirement, survivors or disability insurance benefits (pensions) from one or both countries because they have not worked long enough or recently enough to meet minimum eligibility requirements. Under an agreement, such workers may qualify for partial US or foreign benefits based on combined, or “totalized,”

coverage credits from both countries (US Social Security Administration 2007).³

Totalization agreements reduce employers' costs, for they no longer have to pay full social security contributions in two countries for an employee working in a foreign country and they raise the portability (or exportability) of US social security benefits, partly because they are then up-rated annually as for beneficiaries in the United States. Since 1978, many such "totalization" agreements have been made. The first agreement was with Italy; the twenty-first and most recent in October 2005 with Japan.⁴ Agreements with four further countries are under negotiation. The number of retired worker beneficiaries under these agreements correspondingly climbed from 970 in 1983 to 76,590 in 2005 (US Social Security Administration 2006: Table 5.M1). Many more, however, receive OASDI benefits in both reciprocal and non-reciprocal countries outside the totalization agreements, i.e., in 2005 only 47 per cent of the 59,022 beneficiaries in Canada came under its agreement (US Social Security Administration 2006: Tables 5J.11 and 5.M).

In December 2005, 441,693 OASDI beneficiaries of all ages were resident in foreign countries within and without totalization agreements. The 372,010 aged 65 or more years formed 1.1 per cent of all seniors who were US social security beneficiaries, and the 167,670 that received retirement benefits (RB) living in foreign countries were 1.2 per cent of the RB total (US Social Security Administration 2006: Table 5J3). Table 15. 5 presents the numbers of RB recipients and widow(er) benefits (WB) resident in foreign countries in December 2005 and the rates of change since 1997 (note that it is restricted to nations with more than 1,200 RB and WB beneficiaries in 2005). The great majority of these beneficiaries were aged 60 or more years but some WB recipients were younger. Over one-fifth of the total in

2005 was in Canada and 10 per cent in Mexico. The next largest concentrations were in Italy, Germany and the UK (7–8 per cent) and in Greece and the Philippines (both 5 per cent). The fastest rate of growth since 1997, 15 per cent a year, was in Thailand, followed by Poland (8 per cent), Australia (7 per cent), Japan and Colombia (both 6 per cent). Only one country saw a decrease in the number of clients over the eight years, Italy. The number in Mexico hardly changed.

Variant Migration Processes and Types of Older International Migrants

Despite the limitations of the social security client statistics, they reveal interesting patterns and variations that expand our understanding of international retirement migration. They provide persuasive evidence that *current* international retirement moves comprise not only amenity-seeking moves to countries with a clement winter climate but also a larger volume of more dispersed migrations that arise from birth, childhood and family connections and from dual-nationality marriages. This section draws on the presented statistics and from the research literature on older migrants and retirement migration to synthesize the current understanding of the diverse character and changing forms of international retirement migrants and migrations.

A stereotypical representation of international retirement migrants has taken hold in gerontology, population studies and common understanding. It is that most are couples, aged from the early fifties to the mid-sixties, who move without dependants at or around the date at which one or both cease paid work. They sell their principal or only home, which commonly is located in a medium- or high-status suburb of a large metropolitan area and buy a house or apartment in a country with a warmer or drier (winter) climate and so in a lower latitude country. The favored destinations, according to the stereotype, are attractive and well-serviced coastal towns and rural areas of high landscape value. Such moves are undertaken by not-poor retirement couples of wide occupational and educational backgrounds but, again referring to the stereotype, they epitomize the healthier, more active and innovative members of the latest cohorts of older people.

³ The cited article explicitly acknowledges that the United States is following Europe's lead in establishing international social security agreements. From the inception of the European Common Market, the principle of the "free movement" of labor was a cornerstone of its policies to encourage wider markets, competition and a "single market" and for this the "harmonization" of national social security systems was an important prerequisite. EU member states concluded "Interim Agreements on Social Security" with each other and other European countries as early as 1953. A much strengthened *European Convention on Social Security* was "opened to signature" in 1972. For further details, see Warnes (2002).

⁴ Details of each agreement are published on the Internet: see http://www.ssa.gov/international/totalization_agreements.html

The current cohort of young-old people (aged 55–64 years) has attracted the label the “baby-boomers” and assertions that they are less family-oriented and more concerned with “quality of life” than their predecessors (Giddens 1991; Murray et al. 2003). It is concluded that their retirement moves are “amenity-seeking”, sometimes with the corollary and implied criticism that they are hedonistic and little concerned with the care and support of their grandchildren or very elderly parents. A recent British study found that baby-boomers are “more anti-establishment, more non-conformist, less deferential, less trusting of those in authority and more hostile to organized religion” (Huber and Skidmore 2003: 34–35) but a well-conducted recent US study concluded that, “with the exception of cognitive age, there were no significant differences between younger and older baby boomers regarding a large number of salient behavioral variables” (Reisenwitz 2007). Some international retirement migrants are certainly fashioning new lifestyles, activities, roles and patterns of social participation in what they themselves perceive as positive approaches to old age (King et al. 2000; O’Reilly 2000, 2004, 2007; Gustafson 2001; Huber and O’Reilly 2004).

The stereotype applies to the majority of older people’s migrations from northwest European countries to southern Europe, to those from New Zealand to Queensland, Australia, and to some from the USA and Canada to the Caribbean and Central America. These attributes do not apply, however, to the majority of older people’s migrations either from Germany to southern European countries and Turkey, or from the United States to Mexico or Italy. The reviewed statistics provide substantial evidence that the stereotypical moves are a minority and that at least two other forms are as or more numerous. A provisional typology of the main types of retirement-transition migrants can be proposed. Apart from the stereotypical form, the most apparent is “return migration”, the moves made by labor migrants when they cease work back to their native countries and regions. Return migrants are themselves very diverse, from highly skilled professionals and senior managers that originated from and return to first-world countries, to those from the opposite end of the occupational spectrum who return to poor countries. In all countries, some who moved from rural provinces to the largest commercial and industrial cities of a country return to their native regions when they retire and some make similar returns across an international

boundary. It is apparent, for example, that among the older international migrants who move from the UK to Ireland or from the USA to Mexico, there are many more returning natives than foreign citizens taking up residence in the country for the first time.

The numbers involved in even the largest *return* migration retirement flows are not easily gauged from social security statistics, partly because many of the destination countries are also tourist destinations. Moves to the Caribbean from both northern Europe and continental North America include both “retirement returns” of 1950s and 1960s immigrants and “amenity-seeking” retirement migrations. The British pensioner population in Caribbean countries has an exceptionally low female to male ratio (as also in Nigeria and Hong Kong), which probably reflects the male dominance in either the post-1950s labor-migration to the UK or in the return moves for retirement. Only a few return migrant populations have attracted systematic study and published accounts (Byron and Condon 1996; Klinthall 2006; Malcolm 1996; Rodríguez and Egea 2006).

For both Germany and the United States, the largest overseas beneficiary populations are in neighboring countries, such as Austria and Canada and in countries a little more distant that have been the source of labor migrants (for the US, Jamaica; for Germany, Italy, Spain and the Balkan countries). For the United Kingdom, a similar pattern applies to Ireland but the largest concentrations of beneficiaries are remote, in the United States, Canada and Australia. The clear inference is that there is a third type of international retirement migration, the substantial flows of older migrants who follow their children’s earlier migrations and that this dispersion is influenced by long-established colonial, trading and overseas settlement connections (Sriskandarajah and Drew 2006). While the processes and consequences of such “family-joining” migrations have been studied among recent inter-continental labor migrants into Europe, the United States and Australia (Attias-Donfut and Wolff 2005; Attias-Donfut et al. 2005; Ip et al. 2007; Min et al. 2005), the comparable older migrants from north west Europe to America and Australasia (and in the case of Germany, to Argentina and Brazil) have not been studied.

It is noticeable from the UK statistics that Australia, Canada, the United States and Ireland have relatively low growth rates of the British pensioner population. There are several indications, from the

comparative rates of growth, mean ages, sex ratios and payment levels, that while all the main forms of the international dispersal of British pensioners are growing, the flows to southern Europe and Nordic countries have the fastest rate of growth. The former confirm the prevailing stereotype of IRM but moves to countries with harsher winters rebut its generalizations. The relatively high female to male ratio among clients in the Nordic countries (also found among UK pensions beneficiaries in the USA) probably reflects dual-nationality marriages and a selective tendency for retirement to be chosen in the country of the husband's birth and citizenship. The unexpectedly high rate of growth to Nordic countries confirms that Britain's commercial and familial overseas connections have been changing from the "far-flung" Empire to European neighbors. Family-oriented international retirement migrations are not necessarily declining; rather, their destinations are shifting slowly from the Antipodes and America to Europe.

The statistics also show that the distribution among foreign countries of a nation's older citizens is heavily influenced by *past* international migration flows, many of which are legacies of commercial, colonial and military connections. The declining numbers of UK pensioners in Zimbabwe and Montserrat during the 1990s are readily explained but other cases of declining numbers reflect colonial and armed-forces associations that are long past. For example, the very large number of British pensioners in the countries of the Indian sub-continent has progressively declined since independence in 1947. The exceptionally high average age of British pensioners in Poland and the current rapid decrease in their number, are closing episodes in the lives of the many Polish young men who migrated to the UK during and after the Second World War, some to serve in the armed-forces and some displaced from their homes by the Russian occupation (Judt 2005). An echo of such effects is found in the small cluster of US retirees in Panama, which stems from the substantial military presence in the Canal Zone until 1999 and the attached Colon Free Trade Zone (Migration Policy Institute 2006: 14–15).

Given the described diversity and complexities, and given that the research evidence is sparse, any categorization of international retirement migrants is provisional. Sufficient is known, however, to identify the four most prevalent types of migrants and migra-

tions, as on Table 15.6. The categories are based on three defining characteristics: whether the course of the migrant's life began in and has been molded by a rich or poor country of birth, education and socialization, so as to differentiate those likely to enter old age with below- or above-average "human capital", whether or not they are a return migrant, and whether or not the predominant motivation is "family-joining" or "amenity-seeking". Only four of the eight possible combinations of the three dichotomized attributes are thought numerous. Two types of return migrants are distinguished, by whether they go back to rich or poor countries. Two types of moves to new country locations are distinguished, by whether the dominant motivation is family joining or amenity seeking. The contrasting modal attributes of the four groups of migrants in both the origin and destination countries are indicated, with reference to eligibility to state-funded welfare and health care, language competence, and size and membership of the family network.

The two groups of return migrants have been nominated because most who move in early adulthood detach themselves to a greater or lesser extent from their parents' and their siblings' generations, raising the likelihood of an attenuated kin support network in old age, but the effect and its implications depend upon the educational and skill levels of the migrant and the individuality of the migration; that is, the extent to which it is matched by the moves of relatives and peers through chain migration. Most young, unskilled labor migrants later marry and raise children in the adopted country. Characteristically, at least in the first generation, their fertility is lower than among their country peers but higher than in the destination country. Given that the educational and occupational levels of even second generation international migrants tend to be lower than national norms, the residential proximity of the parents' and the children's households is for many groups relatively close, as among Italian and Spanish migrants in Switzerland (Bolzman et al. 2001). This explains why, although the majority of young, unskilled labor migrants anticipate a return, as they approach old age an increasing proportion decide to stay and to make long visits to their native region (Bolzman et al. 2004). The situations of first-world skilled labor migrants differ in several respects. They are more likely to retain citizenship in and strong connections with the origin country and their greater affluence enables

Table 15.6 Four groups of international retirement migrants

Attribute	Types of older international migrants and migrations			Amenity-seeking movers to new countries
	Returns of natives to “first world” countries	Returns of natives to “third world” countries	Family joining movers to new countries	
Entitlements to state welfare and health care in origin country	Qualified by duration of residence and tax or contributions record	Qualified by duration of residence and tax or contributions record	Yes	Yes
Entitlements to state welfare and health care in destination country	Qualified by duration of residence and tax or contributions record	Qualified by duration of residence and tax or contributions record	Only if becomes permanent resident or taxpayer and in some countries is citizen	Only if becomes permanent resident or taxpayer and in some countries is citizen
Close family members in origin country	Commonly but many multinational children are mobile and scattered, especially of skilled migrants	Variable. Chain migrations create extended family networks but many labor migrants have thin networks. Children, except for single migrants.	In most cases. Not for those whose children have all emigrated.	In most cases. Not for those whose children have all emigrated.
Close family members in destination country	Commonly but many multinational children are mobile and scattered, especially of skilled migrants	Mainly ascendants and age-peers. Adult children commonly remain in adopted country.	Yes but small networks – the migration is to be proximate to very close children or age-peers	Very rarely, especially among first-wave migrants
Language competence in origin country	Variable, low for majority	Variable, low for majority	Yes	Yes
Language competence in destination country	Yes	Yes	Yes for anglophones, no for others	No, although many English-speaking destinations available

more frequent visits, especially in early adulthood. They are more likely to possess privately-purchased or employer-subsidized health-care insurance and a substantial pension. They have more choices about where to settle in old age.

If most aged labor migrants have more children than their age peers in the host population, the emotional closeness between the two generations can be relatively low. It is possible that the children of migrant parents have a high propensity to migrate themselves, but the more widely recognized tendency is for the attitudes and aspirations of the two generations to diverge (through the children's greater education and acculturation). On the other hand, many labor migrants in Europe, Canada and the USA from Roman Catholic and Islamic countries, especially those from rural backgrounds, inculcate high family values among their children (Ajrouch 2005; Cylwik 2002). Social-work research tends to focus on the most dysfunctional cases of rejection and stress between the generations but overall it is unclear whether the prevalence of parent-child attitudinal differences and disaffection are greater among migrant than native populations.

The international labor migrants on the threshold of old age with the weakest family resources are those whose migration and life histories have been characterized by strong sex-selection and low rates of marriage, family formation and fertility. There are many such among those from China and Hong Kong who have worked in rich countries in low-cost restaurants and the take-away catering trade (Chau and Yu 2001; Yu 2000). Many work long hours for low wages, especially so if they are illegal migrants or irregular workers and are exposed to the occupational hazards of poor hygiene and cramped working conditions. In France, "a small proportion of older immigrants, mainly from North African countries, have grown old in working men's hostels and are socially isolated from the wider community" (Bonvalet and Ogg 2008: 772, citing Gallou 2007). Others have weak social networks in both origin and adopted countries but nonetheless return to their native countries on retirement. An equivalent group of third world migrant women move to rich countries to work in hotels, nursing homes, boarding schools and private homes as maids and carers. While for most this is a brief interlude in their lives, some continue in these occupations for decades, or return to them after the breakdown of a relationship or marriage, while others

fall into sex work or other insecure, hazardous and poorly-paid occupations. Some return to their native countries when they cease work but have a high risk of remaining isolated and deprived.

It is emphasized that there are considerable variations in advantage, exclusion and human capital for old age within the categories – for example, a Gujarati entrepreneur who has spent his or her working life in England or Canada and returns to Goa, India, will likely have a strong family network and good access to informal and community support in their native country. By contrast, an older Andalusian or Italian from an impoverished 1930s agricultural area who worked in Switzerland or Germany and returns to their native village may find that it has been successively depopulated and then settled by middle-class metropolitans. They also are at high risk of isolation and poor support. It is also stressed that, although it appears that the number of North Americans and northern Europeans moving to amenity-oriented destinations is increasing faster than the number moving to kin-oriented destinations, this should not be interpreted as evidence of a decline in inter-generational involvement and solidarity among the most recent cohorts of older people. As O'Reilly's (2000, 2007) and Huber's (2005) research has clearly shown, some retired couples in Spain devote much of their energy and resources in support of their children and grandchildren in the northern European country from which they came. All surveyors of international amenity-seeking retired migrants are told of precipitate returns to the origin country to help close relatives through sickness or a personal crisis. High-achiever older people pursue multiple roles and activities with impressive organization and energy.

Personal Implications of Late-life International Migrations

There is only limited information about the medium and long-term personal welfare consequences of international retirement migrations. Most published evidence is from local surveys of recent concentrations of amenity-seeking migrants. The strong consensus in their findings is that the migrants report high levels of satisfaction with their move and new domestic and social circumstances (e.g., Sunil et al. 2007; Warnes et al. 1999, 2004). As

with all migration evaluations, however, the respondents in the destination areas exclude the disenfranchised movers that have returned. The majority of the respondents to such surveys are generally in early old age and believe that they will return to their countries of origin in later life. Most probably do but no data show the flow and many stay on and resolve never to return. The British retirees in advanced old age that have been interviewed in southern Europe give convincing accounts of their adjustment and positive evaluations of their move and expatriate lives, even when beset by illness and frailty (King et al. 2000). The well serviced towns and villages of Malta and the Spanish islands and coasts are more supportive of single, frail older migrants than low population-density rural areas in France and Italy, as the migrants recognize. There are of course many cases of increasing difficulties, as brought about by interactions between diminishing resources (e.g., below inflation pension increases), bereavement, increasing care needs and compromised entitlements to social security income and state welfare support (Ackers and Dwyer 2002, 2004). A few find themselves in impossible situations of unmet need, neglect and abuse (Hardill et al. 2005). Those in desperate situations characteristically turn to formal welfare agencies or a national consul for help to “get them home”. In the UK case, however, a citizen who has not been habitually resident in the country is not entitled to other than emergency treatment on the National Health Service and if they have no “local connection”, no local government authority is required to offer social services support (a legacy of poor-law entitlement rules).

The first comparative analysis of the health of international retirement migrants and their origin and host-country peers has just been published (La Parra and Mateo 2008). The authors carried out a survey of 155 British long-term retiree residents (i.e., living in Spain for more than three months a year) on the Costa Blanca, Alicante, Spain with items on health conditions and utilization of health-care services. Questions identical to those asked in the *Health Survey for England 2003*, the *British Household Panel Survey 2004*, the *National Health Survey for Spain 2003* and the *Spanish Household Panel Survey 2000* were administered, covering age, gender, self-assessed health, long-standing illness, number of visits to general practitioners, hospital in-patient visits, the EUROQUAL health status measure EQ-5D, tobacco and alcohol consumption, total household income and other socio-demographic measures. The health status distributions were then

compared with those reported by the *Health Survey for England* in 2003 and the *National Health Survey* in Spain in 2005. It was found that British nationals aged 45 or more years who resided on the Costa Blanca had a similar health profile to the Spanish and the British populations but scored higher than both on some indicators: for example, they had fewer mobility or self-care problems, a high level of personal autonomy and a more positive self-evaluated health. The British retired migrants’ frequency of visits to a general practitioner was similar to that of their Spanish neighbors but the frequency of admissions to hospital, while similar to that of their compatriots living in the UK, was higher than among the Spanish in Spain. Greater use was made of private health-care than among both home populations.

There are two competing hypotheses about the selectivity of older migrants who move from high latitudes to warmer climate regions. One is the “healthy migrant” proposition, that long-distance migrants are selective of the more active and healthier – it is a variant of a more general hypothesis that is applied to migrants of all ages, that they over-represent the better educated, more ambitious and more resourceful. The converse hypothesis is that the southward flow over-represents those with respiratory and other chronic disorders for which moving to a drier and warmer climate is prescribed. “Among the British residents on the Costa Blanca, men aged 45–64 years seemed to have worse health than women in the same age group, or in relative terms, than older men. This suggests that a poor health condition could be a factor for an early retirement and for the move to Spain” (La Parra and Mateo 2008: 97). Cigarette smoking and alcohol consumption were comparatively high among the British living in Alicante and the consumption of both had risen after they moved to Spain. This effect among British women in Alicante is the inverse of the trend in the United Kingdom. Overall, the evidence available to date reveals no substantial or consistent differentials between the health of international “amenity-seeking” retirement migrants and their age-peers in the home country, or indeed in the incidence of negative health events once they have moved.

The two recent studies of US citizens who have retired to Mexico also report generally high levels of satisfaction with the move. Sunil, Rojas and Bradley (2007: Table 2) surveyed a convenience sample of 211 non-Hispanic US-citizen retiree residents aged 55 or more years in the towns of Chapala and Ajijic,

near Lake Chapala in the state of Jalisco, Mexico. Of these, 87 per cent “agreed” or “strongly agreed” with the statement, “I am satisfied with my life in Mexico” and 92 per cent affirmed that “My retirement lifestyle matches my expectations”. Four main reasons for retiring to Mexico were identified: financial advantages, the attractive natural environment, the vibrant retiree community and opportunities for friendship and a “better quality of life”. Ninety-one per cent agreed with the statement that “my income allows me more leisure spending than if I were in the US” and there was strong agreement with the statements “I feel financially secure in Mexico” and “my decision to move (here) was mainly economic”. An important component of this motivation was lower medication and health-care costs.

Another recent study has widened the range of both the methodologies and topics or academic evaluations of international retirement migration. Howard (2008) attempted to estimate the number of “Western” retirees resident in Thailand by contacting all relevant embassies and consulates in Bangkok. “Putting together the embassy estimates and extrapolating from tourist arrival numbers gave a rough estimate of about 98,000 Western residents, close to the oft-cited local Thai media figure of 100,000 (the origin of which is unknown). Four embassies had estimates of retiree numbers, which were usually around 10 per cent of their total residents; the UK with 957 retirees, Switzerland with 440, France with 683 and Austria with 180.” The author’s own Internet survey of 1,003 Western residents in Thailand found that 143 (15 per cent) of the respondents were retirees. “Assuming that 10–15 per cent of Western residents are retirees, this would suggest 10,000–15,000 Western retirees” (Howard 2008: 151).

As the tabulated statistics from the German and US social security data demonstrated, there is a very high rate of growth of their retired citizens resident in Thailand and these groups have an exceptionally high ratio of men to women (Tables 15.4 and 15.5). Howard’s Internet survey has provided evidence of both the usual motives for retiring to low-income nations, “such as lower living costs and a warm climate ... the lifestyle, culture and a dislike of their home nation” and of a distinctive attraction: “anecdotally, a common motive is the availability of attractive sexual partners. In Pattaya and in parts of Bangkok, a frequent sight is a Western man apparently aged 70 or over hand-in-hand with a much younger Thai woman. Indeed, about half cited this motive.” The responses to the open-ended

questions about the reasons for the migrations included prominently “low living costs, available sexual partners, the friendly, polite Thai people, personal freedom, the easy lifestyle and the social life and sense of community that some found lacking in the West”.

The median age of the respondents was 60 years and although 13 nationalities were represented, most were from the US, the UK and Australia. Howard comments that Thailand “has many retirees from Germany but only two did the survey, perhaps because the questionnaire was in English” and that “only one respondent was female” and “60 per cent had at least a bachelor’s degree. Most had either married a Thai or had a live-in Thai partner. Most of the respondents were happy with their move and would stay even if they won US \$10 million in a lottery; most (80 per cent) planned to stay for life or until adverse circumstances induced them to leave.” The majority of the respondents had lived in Thailand for only a few years (median 3.5). Howard proposes an interesting characteristic temporal sequence, of a honeymoon period and mounting problems after a few years, not least with the renewal of residence visas and tensions around the material expectations of female partners and their families.

Migration or Transnational Residence

The ease and low cost of international travel now means that many older people can exploit, maintain and continue to develop residential opportunities, social networks and welfare entitlements in more than one country. The elaboration of transnational life styles is proceeding faster than our information about their forms. There are multiplying reports from northern European countries, specifically The Netherlands, Belgium, France, Norway, Sweden and Switzerland (Ahmadi and Tornstam 1996; Bolzman et al. 2004; Gustafson 2008; Hoeksma 2004; Lie 2002; Torres 2004), that long-term international labor migrants who reach retirement have maintained and established links and residences (or residential opportunities) in both their adopted and their origin countries – and some in third countries too. Transnational activity patterns or “time-space use” have attracted considerable attention from both migration and cultural-change researchers in recent years but the phenomenon is normally associated with high-achiever, young, training- and career-oriented individuals. The

enabling technological changes, in long-distance travel and telecommunications, are however also manifestly changing older people's lives, not least those of relatively low income and from ethnic and cultural minorities (Gilleard and Higgs 2000, 2005).

Convincing evidence has been presented by Poulain and Perrin (2002: Fig. 3.6, p. 79) from Belgium's continuous registration data. They show that many Turks migrate to and from Belgium at all ages, with both the inward and the departure flows showing the "adolescent" and "retirement" transition peaks. Many other long-term labor migrants in retirement "shuttle" at least once a year between the two countries. They have inherited from their distinctive life course the exceptional "capital" for old age of access to both Turkey's low living costs and Belgium's superior health and social services. Burholt (2004a) has shown similar complexities of time-space use, social networks and financial transfers among aged South Indian labor migrants in Birmingham, England. Maintaining dual residences (with the help of relatives and friends) enables foreign migrants to maximize their social and family contacts and quality of life, as well as access to a wide range of resources. Such transnational residential patterns are replicated by an increasing number of affluent northern Europeans who acquire second homes in and retire to, southern European countries (King et al. 1998; Huber and O'Reilly 2004).

Conclusions

Given the immense diversity of international retirement migrations, generalizations about their characteristics, motivations and the consequences of the moves are both difficult and vulnerable to distortion. This is partly because both popular commentaries and studies focus on atypical forms and flows. Social gerontologists and socio-legal academics that take an interest in migrants have been drawn, for example, to those that have been disadvantaged by their decision and the emphasis tends to create the impression that international migration creates personal problems (Ackers and Dwyer 2002, 2004; Hardill et al. 2005). Moreover, some have asserted that migrants have less commitment to the welfare and care of aged parents and that their behavior is less motivated by filial responsibility than that of non-migrants. As Peter

Townsend's (1963) reflections on the adult children who moved out of London during the 1950s to peripheral housing estates suggested, there is truth in this but a nuanced understanding is required. Higher income groups and particularly those with above-average education, are more likely to migrate long distances than others. The residential separation between next-generation kin positively correlates with income and education. It would be a travesty, however, to suggest that the more educated are less concerned with their children's and parents' well-being than the little educated. The types of kin interactions, the instrumental expressions of their mutual concern and the types of support and care exchanged all vary by era, income, socio-economic group and life course stage of the participants. Today, north European parents who retire to the Mediterranean coast, or Americans who retire to Mexico, can be in touch several times each day with their children who are raising infants, or with an increasingly frail parent living on their own; and should there be a crisis, they can be back within a day. Several aspects of the "social insurance" that extended working-class families provided in Europe until the 1940s have been made redundant by greater affluence, the welfare state, rapid travel and instant communication.

The study of older migrants deserves a more prominent place in social gerontology. Older migrants include many deeply disadvantaged and excluded people and understanding their situation tells us a great deal about social change and about the policy and administrative bases of these ills. Incidentally, in comparison to older people who are disadvantaged through physical and mental illnesses, the disadvantage that accrues from a migration history or cultural difference may be more tractable through community initiatives and service change. Other international retirement migrants are among the most enterprising and self-assertive practitioners of "positive ageing" and "personal development" in later life. Some visible groups have already provided rich anthropological case studies of life in the "third age" and of the distinctiveness of the baby-boomers (and in the process shown that generalizations of the attitudes and behavior of entire birth-cohorts are precarious). Other groups have not been studied at all, notably the family-joining migrants who move for retirement from one affluent country to another. There is every chance that the pace of social, economic and demographic change will be faster in the next few

decades than in the last and that an abiding element will be substantial international migration. As average living and welfare standards rise, partly through the contributions of international migrants, the case for a closer integration of migration and social policy is strong.

Acknowledgements I thank Jim Rynn of the UK Department for Work and Pensions for assistance in obtaining the UK social security data and Claudia Kaiser of the University of Halle-Wissemburg, Germany, for help with obtaining the equivalent German data.

References

- Ackers L, Dwyer P (2002) Senior citizenship? Retirement, migration and welfare in the European Union. Policy, Bristol, Avon, UK
- Ackers L, Dwyer P (2004) Fixed laws, fluid lives: the citizenship status of post-retirement migrants in the European Union. *Ageing Soc* 24(3):451–475
- Ahmadi F, Tornstam L (1996) The old flying Dutchmen: shuttling immigrants with double assets. *J Aging Identity* 1(3):191–210
- Ajrouch KJ (2005) Arab-American immigrant elders' views about social support. *Ageing Soc* 25(5):655–674
- Anil M (2004) The impact of the German citizenship reform of 1999 on Turkish immigrants in Berlin. Report 6/2004, Research and Training Network on Urban Europe, Department of Sociology and Social Research, University of Milan-Bicocca, Italy. Available online at http://www.urban-europe.net/working/06_2004_Anil.pdf
- Arza C, Johnson P (2004) The development of public pensions from 1889 to the 1990s. Discussion Paper 20, SAGE Research Group, London School of Economics, London
- Attias-Donfut C, Wolff F-C (2005) Transmigration et choix de vie à la retraite. *Retraite et Société* 44(1):79–105
- Attias-Donfut C, Tessier P, Wolff F-C (2005) Les immigrés au temps de la retraite. *Retraite et Société* 44(1):12–47
- Banks S (2004) Identity narratives by American and Canadian retirees in Mexico. *J Cross Cult Gerontol* 19(4):361–381
- Bolzman C, Fibbi R, Guillon M (eds) (2001) Emigrés-Immigrés: Viellir et Là-bas. Special issue, *Rev Eur Migr Int* 17(1):7–198
- Bolzman C, Poncioni-Derigo R, Vial M, Fibbi R (2004) Older labor migrants' well being in Europe: the case of Switzerland. *Ageing Soc* 24(3):411–429
- Bonvalet C, Ogg J (2008) The housing situation and residential strategies of older people in France. *Ageing Soc* 28:753–777
- Burkhardt B, Terrell D (1996) Where do Americans live abroad? *Int Migrat Rev* 30(3):788–802
- Brenan G (1957) South from Granada, Hamish Hamilton, London
- Breuer T (2003) Deutsche Rentnerresidenten auf den Kanarischen Inseln [German pensioners living on the Canary Islands]. *Geogr Rundsch* 55:44–51
- Burholt V (2004a) Transnationalism, economic transfers and families' ties: Inter-continental contacts of older Gujaratis, Punjabis and Sylhetis in Birmingham with families abroad. *Ethnic Racial Stud* 27(5):800–829
- Burholt V (2004b) The settlement patterns and residential histories of older Gujaratis, Punjabis and Sylhetis in Birmingham, England. *Ageing Soc* 24(3):383–410
- Burkhauser RV, Lillard DR, Valenti PM (2004) Long-term labor force exit and economic well-being: a cross-national comparison of public and private income support. WP 2001-014, Michigan Retirement Research Center, University of Michigan, Ann Arbor
- Byron K, Condon S (1996) A comparative study of Caribbean return migration from Britain and France: towards a context-dependent explanation. *Trans Inst Br Geogr* 21(1):91–104
- Casado-Díaz MA, Kaiser C, Warnes AM (2004) Northern European retired residents in eight southern European areas: characteristics, motivations and adjustment. *Ageing Soc* 24(3):307–326
- Castles S, Davidson A (2000) Citizenship and migration: Globalization and the politics of belonging. Routledge, London
- Castles S, Miller MJ (2003) The age of migration. Guilford, New York
- Chau R, Yu WK (2001) Social exclusion of Chinese older people in Britain. *Crit Soc Policy* 21(1):103–125
- Cylwik H (2002) Expectations of inter-generational reciprocity among older Greek Cypriot migrants in London. *Ageing Soc* 22(5):599–613
- Eltis D (ed) (2002) Coerced and free migration: Global perspectives. Stanford University Press, Stanford, New York
- Friedrich K, Kaiser C (2002) Retnersiedlungen auf Mallorca? Möglichkeiten und Grenzen der Übertragbarkeit des nordamerikanischen Konzepts auf den Europäischen Sunbelt [Retirement communities in Mallorca? The potential for and limits to the transferability of a North American concept to the European sunbelt]. *Eur Reg* 9(4):204–211
- Gallou R (2007) Situations et perspectives résidentielles des ménages immigrés vieillissant en France [Residential perspectives of minority ethnic households in France]. In: Bonvalet C, Drosso F, Benguigui F, Huynh M (eds) Vieillesse de la population et logement. Les stratégies résidentielles et patrimoniales [Population ageing and housing: residential strategies and asset management]. Documentation Française, Paris, pp 303–321
- Giddens A (1991) Modernity and self-identity: self and society in the late modern age. Polity, Cambridge
- Gilleard C, Higgs P (2000) Cultures of ageing: self, citizen and the body. Prentice-Hall, Harlow, Essex, UK
- Gilleard C, Higgs P (2005) Contexts of ageing: class, cohort and community. Polity, Cambridge
- Gustafson P (2001) Retirement migration and transnational lifestyles. *Ageing Soc* 21(4):371–394
- Gustafson P (2002) Tourism and seasonal retirement migration. *Ann Tourism Res* 29(4):899–918
- Gustafson P (2008) Transnationalism in retirement migration: the case of North European retirees in Spain. *Ethnic Racial Stud*, iFirst paper, 25 pp doi: 10.1080/01419870701492000
- Hardill I, Spradbery J, Arnold-Boakes J, Marrugat ML (2005) Severe health and social care issues among British migrants who retire to Spain. *Ageing Soc* 25(5):769–784

- Helset A, Lauvli M, Sandlie HC (2005) Jubilados Noruegos en España: perspectivas de una cuarta edad para personas de la tercera edad [Norwegian retirees in Spain: anticipations of the fourth age by people in the third age]. In: Rodríguez V, Casado-Díaz MA, Huber A (eds) *Migración internacional de retirados en España* [International retirement migrants in Spain]. Consejo Superior de Investigaciones Científicas, Madrid, pp 169–194
- Hoeksma J (2004) The care needs of elderly Chinese migrants in Rotterdam. In: Warnes AM (ed) *Older migrants in Europe: essays, projects and sources*. Sheffield Institute for Studies on Ageing, University of Sheffield, pp 62–65
- Howard RW (2008) Western retirees in Thailand: motives, experiences, wellbeing, assimilation and future needs. *Ageing Soc* 28(2):147–166
- Huber A (2005) Retirados Suizos en la Costa Blanca (Provincia de Alicante) [Swiss retirees on the Costa Blanca]. In: Rodríguez V, Casado-Díaz MA, Huber A (eds) *Migración internacional de retirados en España* [International retirement migrants in Spain]. Consejo Superior de Investigaciones Científicas, Madrid, pp 95–119
- Huber A, O'Reilly K (2004) The construction of Heimat under conditions of individualised modernity: Swiss and British elderly migrants in Spain. *Ageing Soc* 24(3):327–352
- Huber J, Skidmore P (2003) *The new old: Why the baby boomers won't be pensioned off*. Demos, London
- International Organization for Migration (IoM) (2005) *Internal migration and development: a global perspective*. Report 19, Migration Research Series, IoM, Geneva, Switzerland
- Ip D, Lui CW, Chui WH (2007) Veiled entrapment: a study of social isolation of older Chinese migrants in Brisbane, Queensland. *Ageing Soc* 27(5):721–740
- Judt T (2005) *Postwar: a history of Europe since 1945*. Heinemann, London
- King R, Warnes AM, Williams AM (1998) International retirement migration in Europe. *Int J Popul Geog* 4(2):140–280 (special issue)
- King R, Warnes AM, Williams AM (2000) *Sunset lives: British retirement to the Mediterranean*. Berg, Oxford
- Klinthall M (2006) Retirement return migration from Sweden. *Int Migrat* 44(2):153–80
- La Parra D, Mateo MA (2008) Health status and access to health care of British nationals living on the Coast Blanca, Spain. *Ageing Soc* 28(1):85–102
- Lawrence DH (1923) *Sea and Sardinia*. Heinemann, London
- Leise E (2007) *Germany strives to integrate immigrants with new policies*. Migration Policy Institute, Washington, DC. Available online at: <http://www.migrationinformation.org/>
- Lie B (2002) *Immigration and immigrants 2002*. Statistiske Analyser 52, Statistics Norway, Oslo
- Longino CF Jr (1995) *Retirement migration in America*. Vacation, Houston, Texas
- Longino CF Jr, Warnes AM (2005) *Migration and older people*. In Johnson ML (ed) *Cambridge encyclopedia of ageing*. Cambridge University Press, Cambridge, pp 538–545
- Malcolm E (1996) *Elderly return migration from Britain to Ireland: A preliminary study*. National Council for the Elderly, Dublin
- Mazorra AP (1991) *Migración de noreuropeos retirados en España: el caso británico*. *Revista España de Geriátrica y Gerontología*, 26(4):255–266
- McHugh KE (2003) Three faces of ageism: society, image and place. *Ageing Soc* 23(2):165–186
- Migration Policy Institute (2006) *America's emigrants: US retirement migration to Mexico and Panama*. Migration Policy Institute, Washington
- Min JW, Moon A, Lubben JE (2005) Determinants of psychological distress over time among older Korean immigrants and Non-Hispanic White elders: evidence from a two-wave panel study. *Ageing Mental Health* 9(3):210–222
- Murray M, Pullman D, Rodgers TH (2003) Social representations of health and illness among baby-boomers in eastern Canada. *J Health Psychol* 8(5):485–499
- O'Reilly K (2000) *The British on the Costa del Sol: Trans-national identities and local communities*. Routledge, London
- O'Reilly K (2004) *The extent and nature of integration of European migrants in Spanish society*. School of Social Science, University of Aberdeen, Aberdeen, Scotland
- O'Reilly K (2007) Intra-European migration and the mobility-enclosure dialectic. *Sociol: J Br Sociol Assoc* 41(2):277–293
- Petersen W (1975) *Population*. Third edition, Macmillan, London
- Poulain M, Perrin N (2002) The demographic characteristics of immigrant populations in Belgium. In: Haug W, Compton P, Courbage Y (eds) *The demographic characteristics of immigrant populations*. Council of Europe, Strasbourg, France, pp 57–130
- Poulain M, Perrin N, Singleton A (eds) (2006) *Towards harmonised European statistics on international migration*. Presses Universitaires de Louvain, Louvain-la-Neuve, Belgium
- Reisenwitz T (2007) A comparison of younger and older baby boomers: investigating the viability of cohort segmentation. *J Consum Mark* 24(4):202–213
- Rodríguez VR, Egea C (2006) Return and the social environment of Andalusian emigrants in Europe. *J Ethnic Migrat Stud* 32(8):1377–1393
- Rodríguez VR, Casado-Díaz MA, Huber A (eds) (2006) *La Migración de Europeos Retirados en España*. *Estudios de Política y Sociedad* 23, Consejo Superior de Investigaciones Científicas, Madrid
- Shinozaki M (2006) *Japanese international retirement migration: a case study of Japanese retired couples in New Zealand*. Workshop Paper, Graduate School of Asia-Pacific Studies, Waseda University, 28th July. Available online at: www.wiaps.waseda.ac.jp/initiative/2006/work/international_01/pdf/Group_02.pdf
- Sriskandarajah D, Drew C (2006) *Brits abroad: mapping the scale and nature of British emigration*. Institute for Public Policy Research, London
- Sunil TS, Rojas V, Bradley DE (2007) *United States' international retirement migration: reasons for retiring to the environs of Lake Chapala, Mexico*. *Ageing Soc* 27(4):489–510
- Tacoli C, Okali D (2001) *The links between migration, Globalisation and sustainable development*. International Institute for Environment and Development, London
- Tamer GN, Erdoğanaras F, Güzey Ö, Yüksel Ü (2006) *Effects of second home development by foreign retirement migration in Turkey*. Paper presented at the 42nd Congress of the International Society of City and Regional Planners, Istanbul, Turkey. Available online at http://www.isocarp.net/projects/case_studies/cases/list01.asp?accepted=%27yes%27
- Tesfaghiorghis H (2004) *Projections of the number of income support recipients, 1999–2051*. In: Department of Families,

- Community Services and Indigenous Affairs (FaCSIA), Australian social policy 2001-02. FaCSIA Government of Australia, Canberra. Available online at http://www.facsia.gov.au/austsocpolicy_2001-2002
- Torres S (2004) Late-in-life immigrants in Sweden: who are they and what do they need? In Warnes AM (ed) *Older migrants in Europe: Essays, projects and sources*. Sheffield Institute for Studies on Ageing, University of Sheffield, pp 59–62
- Townsend P (1963) *The Family Life of Old People*. Penguin, Harmondsworth, Middlesex, UK
- US Social Security Administration (1998) *Social security bulletin: annual statistical supplement 1998*. Government Printing Office, Washington, DC. Available online at <http://www.ssa.gov/statistics/Supplement/1998> reference added in Table 5 notes
- US Social Security Administration (2006) *Social security bulletin: annual statistical supplement 2005. Old-age, survivors, and disability insurance, benefits in Current-Payment Status*. Government Printing Office, Washington, DC. Available at www.socialsecurity.gov
- US Social Security Administration (2007) *US International social security agreements*. Webpage at: http://www.ssa.gov/international/agreements_overview.html
- Walters WH (2002) Later-life migration in the United States: a review of recent research, *J Plann Lit* 17(1):37–66
- Warnes AM (1991) Migration to and seasonal residence in Spain or northern European elderly people. *Eur J Gerontol* 1(1):53–60
- Warnes AM (1993) The development of retirement migration in Great Britain. *Espace Popul Soc* 3:451–464
- Warnes AM (2001) The international dispersal of pensioners from affluent countries. *Int J Popul Geogr* 7(6):373–388
- Warnes AM (2002) The challenge of intra-union and in-migration to “Social Europe”. *J Ethnic Migrat Stud* 28(1):134–152
- Warnes AM (ed) (2004) *Older migrants in Europe: essays, projects and sources*. Sheffield Institute for Studies on Ageing, Sheffield, Yorkshire
- Warnes AM, King R, Williams A, Patterson G (1999) The well-being of British expatriate retirees in southern Europe. *Ageing Soc* 19(6):717–740
- Warnes AM, Friedrich K, Kellaher L, Torres S (2004) The diversity and welfare of older migrants in Europe. *Ageing Soc* 24(3):307–326
- Warnes AM, Patterson G (1998) British retirees in Malta: components of the cross-national relationship. *Int J Popul Geogr* 4(2):113–134
- Warnes AM, Williams A (2006) Older migrants in Europe: a new focus for migration studies. *J Ethnic Migrat Stud* 32(8):1257–1281
- Yu WK (2000) *Chinese older people: A need for social inclusion in two communities*. Policy Press, Bristol, UK

Chapter 16

Immigrants and Aging

Judith Treas and Jeanne Batalova

Introduction

Immigration is remaking populations not merely in nations like the U.S. that have long welcomed newcomers but also in societies that have not traditionally received immigrants. Although the U.S., with its policy emphasis on family re-unification, admits increasing numbers of aging immigrants, immigrants are usually young. With the passage of time, they grow older and may make up a significant share of the aged population in places where there have been high and sustained levels of immigration. An important question is whether the well-being of this older immigrant population approaches that of native-born seniors or is characterized by significant disadvantage. The answer to this question depends on immigrant selection and incorporation processes, that is, on the characteristics of those who come to stay as well as on the extent to which they are integrated economically and socially into the society.

For a rough indication of what the future holds, we can compare native-born and foreign-born older adults in the U.S. today. However, older Americans in coming decades will not necessarily resemble today's seniors. Because of changes in immigrant flows, they are more likely to hail from Asia or Latin America and less likely to come from Europe. As newcomers, they may not have started at the same place as earlier immigrants and they may not traverse the same path to old age as the current generation

of immigrant elderly. Changes in the opportunities provided by the economy and cut-backs in the safety net protecting individuals from extreme deprivation are apt to affect all Americans but newcomers are especially vulnerable.

There are many commonalities between older foreign-born persons and their U.S.-born counterparts today. Age-related challenges like widowhood and disability affect both groups. However, older immigrants, on average, are at a socio-economic disadvantage. They are not as well educated as native-born older adults and they are more likely to live in low-income families. Further, among older immigrants there are noteworthy distinctions. Much less well-off than long-term immigrants, recent elderly arrivals, often the parents of naturalized U.S. citizens, remain very dependent on family for support.

Looking to the middle of the 21st century, our chapter begins with a brief overview of the age structure of immigrants in the U.S. and projections of the number and share of immigrants in the older population. The chapter turns to a discussion of trends in U.S. immigration and welfare laws that shape the context of reception for immigrants who are or will be old. Because age at immigration is an important determinant of incorporation and adaptation, the paper explicitly considers the flow of older immigrants to the United States. We recognize the diversity of older immigrants with analyses of their geographic distribution across the U.S., their changing race-ethnic composition and the age distribution of foreign-born older adults, which differs between newcomers and long-time immigrants. We gauge the incorporation of the older foreign-born population, noting the distinction between long-term residents of the United States and older newcomers as well

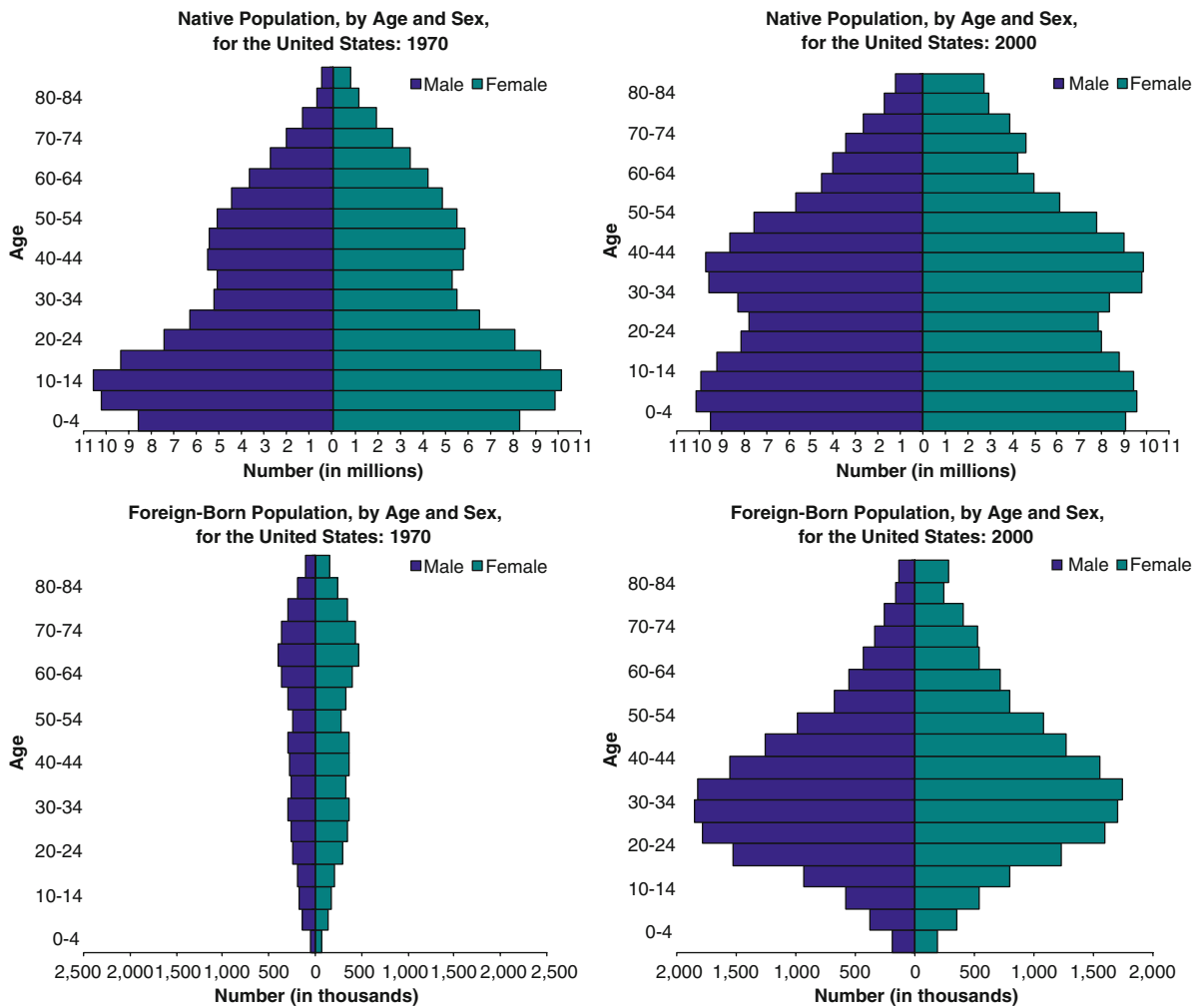
J. Treas (✉)
University of California, Irvine
Irvine, US
E-mail: jktreas@uci.edu

as highlighting variations among origin groups. To evaluate the economic position of immigrants, we consider their employment and income, especially in old age. We also give weight to social indicators of incorporation, namely English language proficiency and living arrangements. We conclude our paper with a discussion of the health of older immigrants and the “Hispanic mortality paradox.” Except as otherwise indicated, statistical information in this chapter is derived from authors’ tabulations of the 5 per cent Public Use Microdata Samples (PUMS) of Census 2000. We use the terms “foreign born” and “immigrants” interchangeably. Where possible, we draw comparisons between immigration to the U.S. and to other developed countries.

An Overview of the Immigrant Age Structure in the U.S.

The youthful nature of the immigrant population of the U.S. today demonstrates its inherent potential to generate a large population of older foreign-born adults in coming decades. One implication is that immigrants will make up an increasingly larger share of the older population by the middle of the 21st century.

Differences in the age-sex structures of immigrant and non-immigrant populations are striking. As Fig. 16.1 shows, the age-sex structure of the native-born American population in 2000 forms a squat pyramid that is unusual only because of its bulge of middle-



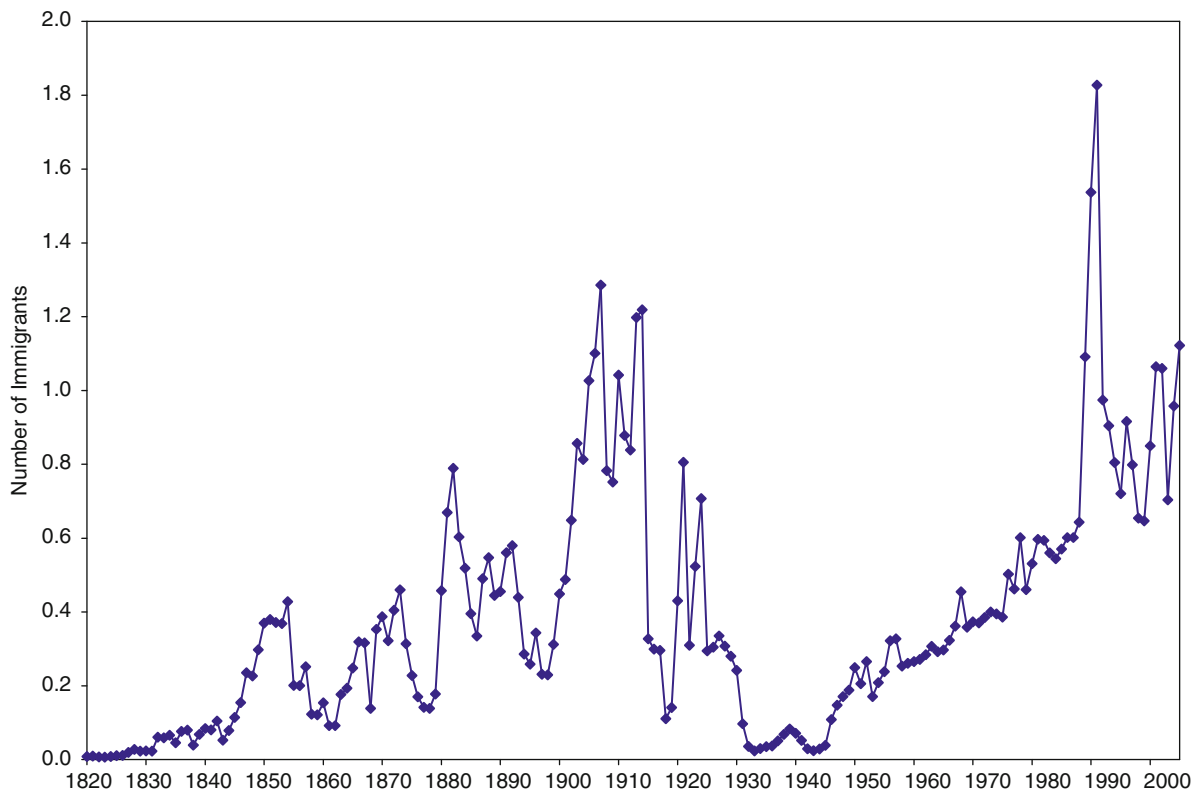
Source: Authors’ tabulations of the U.S. Census 1970 and 2000.

Fig. 16.1 Age and sex pyramids for native and foreign-born Americans: 1970 and 2000

aged baby boomers born between 1946 and 1964. These same baby boomers were children, adolescents and young adults in 1970. The foreign-born in 2000 are configured as a diamond with roughly equal numbers of men and women. This immigrant age structure has relatively few children and few older adults. (Immigrant households, of course, contain other children but they are U.S. citizens born to immigrant parents). The largest age group is made up of persons in their thirties, that is, the prime working years. This diamond-shaped structure is a consequence of the increased volume of immigration – largely of young adults – over recent decades and it demonstrates the dramatic potential for growth in the older immigrant population as today’s young adults grow old. The diamond shape in 2000 is a new phenomenon. Reflecting previous eras of slow immigration, the immigrant population age-structure in 1970 was shaped like a narrow dagger taper-

ing down to a point. There were few children and the largest group consisted in older adults in their sixties, an echo of the last big wave of immigration in the early decades of the 20th century.

In contrast to settled societies of the Old World, the United States has a long history of population growth by the process of immigration. First, there were the Spanish and British settlers and African slaves who arrived during colonial times. Later, waves of immigrants came from Europe in the 19th and early 20th centuries. The restrictive national origin quotas of the 1920s, followed by the Great Depression and World War II, choked off immigration to the U.S. Immigration began to rise only after World War II and continued to climb with the 1965 changes in U.S. immigration law. Immigrants from Asia, Latin America and Africa dominated immigration flows after the 1965 revisions of the U.S. Immigration and Nationality Act. As Fig. 16.2



Source: Derived from Table 1 in DHS, Yearbook of Immigration Statistics: 2005, US Government Printing Office, Washington, DC. Available at: <http://www.dhs.gov/ximgtn/statistics/publications/LPR05.shtm>.

Notes: Lawful permanent residents admitted to the United States consist of two groups: those who arrive from abroad on immigrant visas and those who were already in one legal status and then adjusted their status to become permanent residents while in the U.S. The number of permanent immigrants admitted to the U.S. fluctuates from year to year, in part, because of the processing backlogs of status adjustments for individuals already in the country.

Fig. 16.2 Immigration to the United States: fiscal years 1820 to 2005 (in millions)

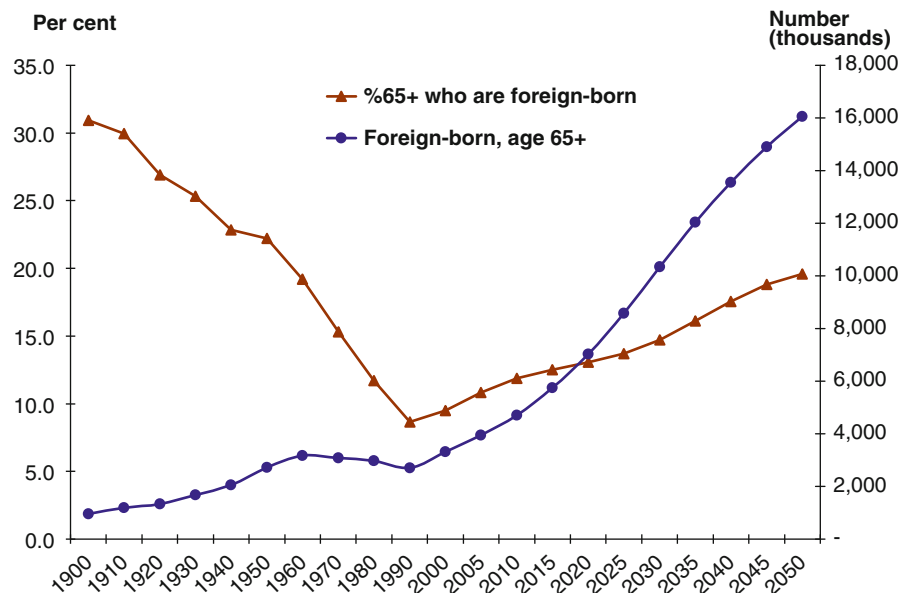
illustrates, immigration to the U.S. had its ups and downs throughout the 19th century but it hit an annual high mark of 1.3 million persons in the first decade of the 20th century. After declining under restrictive immigration quotas of the 1920s and finally bottoming out during the Great Depression of the 1930s, the numbers gradually climbed after World War II, surging in the late 1980s to a record 1.8 million in 1991. At the start of the 21st century, about one million new immigrants were becoming permanent residents each year.

What was constant about these flows was that immigration was driven largely by young people who were attracted by economic opportunities. Although some immigrants returned to their homelands, most settled to make their home and grow old in the U.S.

Given a time lag to allow for the aging of immigrants, the foreign-born share of the older population has largely tracked the earlier trends in immigration levels. The proportion of the U.S. older population that was foreign-born declined from 31 per cent in 1900 to 9 per cent in 1990, after which it began to rise (see Fig. 16.3). At 9.5 per cent in 2000, this figure is

projected to approach 20 per cent by 2050 when over 16 million older Americans are expected to be foreign born. In short, the foreign-born will make us a sizable minority of older Americans by the middle of the 21st century.

The accuracy of these projections is subject to the usual cautions, especially with regard to assumptions about the future course of immigration and mortality. The perils of projecting the total immigrant population were demonstrated in 2000 when the census counted four million more immigrants than were projected based on the 1990 numbers of immigrants living in the U.S. and the anticipated migration over the decade. Short-run projections of the number of older immigrants benefit from the fact that most people immigrate early in life. Because fewer than 15 per cent of immigrants admitted to the United States as permanent residents were 50 years of age or older in 2005 (U.S. Department of Homeland Security 2002: Table 6), most of the immigrants who will be elderly in a decade are already living in the U.S. Projections of the older immigrant population in 2050, however, are much more uncer-



Source: Data for 2000 to 2050 are from US Census Bureau. 2003. National Population Projections. "Projections of the Foreign-Born Population by Age, Sex, Race, and Hispanic Origin: Lowest, Middle, and Highest Series, 1999 to 2100." Available at <http://www.census.gov/population/www/projections/natdet.html>; Data from 1900-1990 are from US Census. Campbell J. Gibson and Emily Lennon (1999) Report 29. "Historical Census Statistics on the Foreign-born Population of the US: 1850-1990" Table 7. Age and Sex of the Foreign-Born Population: 1870 to 1990. Available at <http://www.census.gov/population/www/socdemo/foreign/reports.html> and US Census Bureau. Various Census years. "Census of Population and Housing". Available at <http://www.census.gov/prod/www/abs/decennial/index.htm>

Fig.16.3 Foreign-born, 65 and older: number and per cent of U.S. population: 1900–2050

tain, if only because many of the future older Americans have not yet immigrated to the U.S. and so their numbers are not yet known. Because projections have tended to underestimate the number of foreign-born, their share of the older population in 2050 might well exceed current projections, barring a major change in immigration policies and immigrant flows. (For more discussion on the challenges associated with making projections of the foreign-born population, see Treas and Batalova 2007).

The number and composition of arrivals has fluctuated over time in response to 1) the changes in immigration laws, which define who and how many are allowed to come (and under which conditions) and 2) the complex interplay of political, social and economic forces and events taking place both in sending countries and in the U.S. Together these forces made up a set of push and pull factors that provided the motives and opportunities for immigrants. Because the number of immigrants and their well-being in old age will depend on immigration and welfare policies, an overview of the legal aspects of immigration offers useful insights into demographic trends in the older immigrant population.

Trends in the Legal Context of Immigration

The older population of immigrants was, for the most part, shaped by immigration policies in force decades earlier. As the next section will illustrate, new conditions in the post-World War II era affected the composition of arriving groups as well as the make-up of the already present immigrant population – developments with significant implications for the older population.

Immigration Policy

Until 1965, the overwhelming majority of the foreign-born persons living in the United States had arrived from different parts of Europe during the earlier waves of mass migration. The national origins and race-based immigration system of the early 20th century favored limited but heavily European immigration. Coupled with the Great Depression and World War II,

this European bias in the National Origins Act of 1924 halted substantial immigration for the next thirty years and preserved the European origin composition of the U.S. immigrant population. The Immigration and Nationality Act (INA) of 1952 established a preference-based immigration system by assigning the slots for permanent immigrant visas to people with relatives in the United States (family-sponsored immigrants) and to persons with needed labor skills (employer-sponsored immigrants). Spouses, minor children and parents of U.S. citizens were exempt from numeric limitations altogether – a development that made it relatively easy for older people to join their naturalized immigrant children in the U.S.

The 1965 amendments to the INA abolished the national origins quotas and further refined the preference system. In the post-1965 period, the United States first began to witness the transformation from predominantly European immigration to Latin American and Asian flows. These flows continue to characterize immigration patterns up to the present. Consequently, the country-of-origin make-up of the population of older immigrants began to change gradually from European to Latin American and Asian. The INA was further amended by the Refugee Act of 1980, which established the Federal Refugee Program coordinating admission and settlement in the United States of waves of refugees and asylees from Vietnam, the former Soviet Union and Latin America. Family and employment-sponsorship, together with this humanitarian effort, make up the three main channels of lawful immigration to the United States, allowing the admission of about one million legal permanent residents annually in recent years. For a comparative perspective on immigration policies and immigrant flows for European nations, see Hammar (1985) and Country Resources (2007).

The Immigration Reform and Control Act (IRCA) of 1986 – the first comprehensive legislation to address the issue of undocumented immigration – legalized nearly 2.7 million illegal immigrants (the majority of whom were from Mexico) as well as introduced stronger enforcement mechanisms at the border and in the workplace. This law has a number of implications for immigrant aging.

First, by permitting many long-time unauthorized residents of the U.S. to regularize their status and become eligible for citizenship, IRCA meant a more secure retirement for a large cohort of immigrants. As IRCA beneficiaries became legal residents and citi-

zens, they enjoyed better employment opportunities (Bratsberg et al. 2002) as well as becoming eligible for means-tested public benefits, including Supplemental Security Income (SSI), the federal welfare program supporting the blind, disabled and elderly poor.

Second, the idea of tighter border enforcement introduced in IRCA has been made a priority in more recent attempts to address the same issue. For example, the appropriations for border control increased from \$273 million to \$1,660 million between 1985 and 2002 or by 500 per cent (Meissner et al. 2006). Increased border control had an unintended by-product: it altered the retirement prospects for more recently arrived unauthorized workers in unanticipated ways. Fearful of being apprehended at the border, unauthorized immigrants are less likely to go back and forth between their home countries and the U.S. (Cornelius and Lewis 2006). By cutting off the historical pattern of circular migration between Mexico (and other sending countries from Latin America) and the U.S., more immigrants will grow old in America. In the absence of another amnesty program, these settled immigrants will have more limited employment prospects and will lack the safety net of government programs on which others rely. At the same time, finding themselves “locked-in,” today’s unauthorized migrants will be less likely to go back home to retire if they have not been able to settle their families, maintain regular social ties and build an economic stake (e.g., a house) in their place of origin.

Third, by creating a path to citizenship, the IRCA paved the way for former unauthorized immigrants to naturalize and become future sponsors of the legal immigration of family members, including aging parents.

Coupled with increasing life expectancy and affordable air transportation easing the rigors of travel, these laws – the 1965 Amendments to the INA, the Refugee Act and the IRCA – encouraged the reunion of older parents with their U.S.-citizen adult children, the arrival of seniors under other visa categories (mostly family and humanitarian) and the long-term stay of some undocumented migrants and their families.

Welfare Policy

The 1996 Personal Responsibility and Work Opportunity Reconciliation Act or PRWORA (commonly known as welfare reform) reinforced older immi-

grants’ dependence on their families for financial support. Although the main impetus behind the reform was to reduce welfare reliance, increase workforce attachment and promote marriages of current welfare recipients, there was also a concern that the United States policies made it a welfare magnet for would-be immigrants (Borjas and Hilton 1995; Haskins 2006). Indeed, analyses revealed that older immigrants, especially those immigrating after age 55, were more likely than others to be receiving welfare benefits (Hu 1997). Whereas prior to the PRWORA, legal immigrants had access to public benefits on similar terms as citizens, the 1996 law placed a number of restrictions on the welfare eligibility of immigrants.

Lawful permanent residents who were already in the United States *on or prior* to August 22, 1996, were made ineligible for food stamps and Supplemental Security Income (SSI). States were allowed to offer such immigrants Temporary Assistance for Needy Families (TANF) and Medicaid, however. The 1996 welfare reform legislation made most lawful permanent immigrants arriving *after* August 22, 1996, ineligible for nearly all welfare benefits for their first five years in the U.S. when they were to be the legal responsibility of their sponsors (Binstock and Jean-Baptiste 1999; Yoo 2001). Although there were exceptions (permanent residents with 40 quarters of employment covered by Social Security, those in the military and refugees and asylees), noncitizens were essentially barred from participation in most of the major federal benefit programs for which eligibility was based on need: TANF, food stamps, SSI and Medicaid.

A sharp decline in welfare participation in immigrant households followed and approximately 935,000 noncitizens lost benefits due to the passage of PRWORA (Fix and Passel 2002). Although immigrants represented 15 per cent of all welfare recipients in the United States at the time of PRWORA’s passage in 1996, that share dropped to 12 per cent by 1999 (Fix and Passel 2002). While persons on temporary visas and unauthorized immigrants were never eligible for federal welfare programs (with the exception of some limited emergency benefits), programs like Supplemental Security Income (SSI) constituted a significant safety net for low-income older adults who were admitted to the U.S. as permanent residents (Treas 1997).

After 1996, Congress restored some benefits. The Balanced Budget Act of 1997 (BBA) reinstated SSI payments to most legal immigrants who arrived before

August 22, 1996 and clarified that a person remained eligible for Medicaid as long as he or she was receiving SSI (Singer 2002). A year later, the Agricultural Research, Extension and Education Act restored eligibility for food stamps to children, elderly and disabled immigrants who resided in the U.S. before the PRWORA's passage. The 2002 Farm Security and Rural Investment Act reinstated access to food stamps for legal immigrants who have resided in the U.S. for five years as well as for immigrant children and disabled immigrants, regardless of their date of entry into the United States.

After welfare reform legislation, welfare participation declined among citizens and noncitizens alike but the decline was steeper among noncitizens. For example, Medicaid coverage declined not only because noncitizens were ineligible but also because eligible persons "voluntarily" relinquished coverage due to the confusion surrounding the changes (Hagan et al. 2003). Studies have documented the precarious economic status of older people who have recently immigrated to the U.S., including their high risk of having no health insurance (Choi 2006). Because welfare reform created a stronger incentive for immigrants to become citizens (Van Hook et al. 2006), we can expect some older people will overcome or outlast the hurdles to naturalization and benefits that they now face.

Citizenship and Welfare Benefit Eligibility

Since the majority of older immigrants have lived in the U.S. most of their lives, 70 per cent of these older adults, 65 and older, were naturalized citizens in 2000, as opposed to only 31 per cent of younger people (Treas and Batalova 2007). Surveys cannot obtain very reliable data on immigrants' legal status but the Urban Institute 5 per cent PUMS 2000 Census database provides estimates of the illegal immigrant population. (For detailed explanation of the methodology behind these estimates, refer to Passel et al. 2004). This method finds that fully 28 per cent of younger immigrants are undocumented but hardly any older foreign-born persons are illegal (Treas and Batalova 2007). (Because the estimates of legal status were based on the age of migrants and some other characteristics such as occupation and industry, the number of unauthorized migrants by age groups can be taken as only

a rough estimate of the true population distribution). With the full rights and benefits of citizenship, most elderly immigrants can count on some public safety net but a quarter of younger people are automatically marginalized by their illegal status. The future of U.S. immigration policy will determine whether people living in the country without legal status will someday be able to become permanent residents and eventually citizens.

Historically, citizenship has been a requirement for old age support. Even before the enactment of federal Social Security in 1935, 17 of the 18 states with old age assistance acts required that recipients be U.S. citizens (Hirst 1932). When the 1996 welfare reform legislation was enacted, however, many legal immigrants were receiving benefits from the same federal programs on which other low-income Americans rely. When these benefits were cut off for newcomers, there was a new incentive to naturalize. Immigrants responded predictably to this incentive and states where immigrants had had greater access to welfare benefits saw a bigger increase in naturalization rates than did states that were less welcoming of immigrants (Van Hook et al. 2006). Older people, however, seem to face greater barriers to naturalization. The experience of the 1970–1974 cohort of immigrants showed that older adults were markedly less likely to have naturalized by 1980 than were middle-aged immigrants (Yang 1994).

To be eligible to become a U.S. citizen, permanent residents have to maintain a residence in the United States for five years, pass a citizenship exam and prove English proficiency. Although the English language requirement is waived for the disabled and for long-term legal residents (e.g., those 55 years old who have been permanent residents for at least 15 years) (U.S. Department of Homeland Security 2002), many older adults find that English is a daunting obstacle to citizenship. Like their counterparts eighty years ago (Hirst 1932), older immigrants complain how hard it is to learn English (Treas and Mazumdar 2002). Describing how her inability to master English kept her from becoming an American citizen, a 61-year-old woman from Mexico explained, "...I don't have the same memory to learn. We (older adults) come to an age where we tend to forget everything. I leave certain things here, and later I won't remember where I left them. ... We've (she and her husband) been to school several times, and when we are there, yes, we do learn but later on that same day we forget everything we learned"

(Treas and Batalova 2007). Plans to make the civics component of the citizenship test more meaningful (e.g., by asking for an abstract explanation of why there are three branches of government instead of asking what the White House is) can be expected to make the test even more difficult for older adults, especially those with limited schooling.

For those who do not obtain citizenship, U.S. law provides that permanent residents can qualify for means-tested federal welfare benefits if they have worked for 40 quarters in employment that is covered by Social Security. Few older immigrants who are new to the U.S. will work the required ten years here in formal employment that is covered by Social Security. Even if their health is good enough to work, many do not have work histories that give them skills that are marketable in the U.S. (Treas 1997). They are usually unemployable, particularly in the formal sector of the economy where employers scrupulously report employment to Social Security. As a 77-year-old woman from Korea put it, "...I'm too old to work. Besides, who would hire me?" (Treas and Batalova 2007).

Implications for Old Age Support

Given that family reunification is the main route for legal immigration, most older adults who immigrate to the U.S. today will remain dependent on their sponsors who bear financial responsibility for their support. The Illegal Immigration Reform and Immigrant Responsibility Act (IIRAIRA) of 1996 reinforced this responsibility with a number of requirements for family sponsorship (Capps et al. 2006). First, sponsors have to sign a legally enforceable support agreement. Second, they must establish their capacity to provide support by showing that their family income equals or exceeds 125 per cent of the U.S. poverty line for a given household size (U.S. Department of Homeland Security 2002). Third, the sponsor's obligation is in force until the sponsored immigrant accomplishes one of the two milestones – becoming a naturalized U.S. citizen or working for a decade in the United States in covered employment. Otherwise, the federal or state government can sue the sponsor to pay off any means-tested public benefits that a sponsored immigrant receives. Given the usual requirement of five years residence to become a U.S. citizen, as well as additional time to

meet the minimum income requirements and to have applications processed, the sponsorship requirements virtually assure that immigrating parents sponsored by their grown children will be late middle-aged or older when they arrive in the United States.

In sum, most of America's older immigrants have naturalized, which is one requirement to become eligible for public programs of support. Many older newcomers, however, will continue to depend not on public programs but on their sponsors and their families for economic support, health care and assistance in everyday life. Family responsibility for elderly relatives has been increased by immigration policies enforcing financial support as a prerequisite for sponsorship, by more restrictive eligibility requirements set by welfare reform and by the unique difficulties naturalization criteria pose for older immigrants. This is not to say that older adults are not important members of America's immigrant families. If they cannot help out financially, they still play invaluable roles in immigrant households. By helping the younger generations with chores and childcare, offering emotional support and affirming family solidarity, they contribute to the successful incorporation of the younger generations in schools and the workplace (Treas and Mazumdar 2004). Indeed, interviews with service providers and elderly consumers in immigrant communities indicate that welfare reform has not only limited older adults' access to public benefits but also made their families more dependent on them for, say, the care of grandchildren (Estes et al. 2006). What is clear is that the increasing numbers and diversity of older immigrants, as well as their reliance on family members, will affect their economic and social integration.

The Flows of Older Immigrants

Most foreign-born older adults are long-time residents of the U.S. According to Census 2000, 61 per cent of older immigrants had lived in the U.S. for thirty or more years. Fully 87 per cent of the 3.3 million foreign-born persons over age 65 had arrived before 1990. Although only one-in-eight older immigrants in 2000 was a newcomer who had immigrated in the last decade, recent immigrants are of particular interest. Welfare policy treats newcomers differently than long-term legal immigrants and those who immigrate at advanced ages

are less readily incorporated into American society. As we will show, older adults have been a growing component of immigration to the U.S.

The Immigration of Older Adults

Figure 16.4 depicts the trends in the admission of permanent residents, 65 and older, between 1956 and 2005. The number of older immigrants has increased over time, as has their share of all the new lawful permanent residents. By the end of the 1990s, older adults made up as much as 5 per cent of those admitted. In 2005, almost 50,000 adults, 65 and older, were admitted and the overwhelming majority of these immigrants (76.6 per cent) were the immediate relatives of U.S. citizens (i.e., parents or spouses) (U.S. Department of Homeland Security 2006: Table 9). During the late 1980s and early 1990s, there was an increase in older immigrants in the aftermath of the 1986 IRCA legislation, which gave undocumented immigrants the legal status to become eligible to sponsor the immigration of family members. Since then, however, the number of immigrants 65 and older has stayed high.

The number of persons admitted as U.S. citizens' parents (regardless of their age) also increased over time. Between 1986 and 2004, they increased from 45,232 (i.e., 7.5 per cent of all LPRs) to 82,113 (7.3 per cent) (U.S. Department of Homeland Security 2006: Table 7). Unless there are revisions to the immigration law, the numbers of aging parents sponsored by grown children can be expected to continue to grow, because there are so many young and middle-aged immigrants in the U.S. who are (or will become) citizens eligible to petition the immigration of their parents.

In thinking about the flows of older immigrants, there are three points to keep in mind. First, immigration statistics do not cover unauthorized immigrants although, of course, the overwhelming majority of older immigrants have legal status.

Second, many older people come to the U.S. as temporary visitors and are not counted among those admitted to lawful permanent residence. In 2005, 2.3 million persons, 65 and older, entered the United States as non-immigrants (U.S. Department of Homeland Security 2006: Table 30). Older adults constituted 7.2 per cent of all non-immigrant admissions. As retirees, older visitors usually come on "temporary visitors for

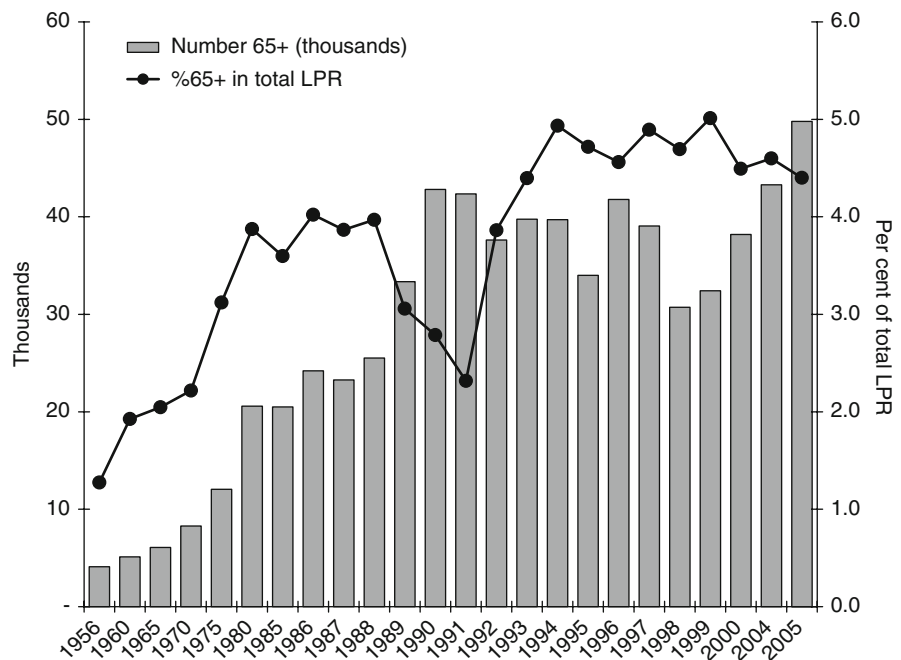


Fig. 16.4 Number and per cent of persons, 65 and older, admitted as lawful permanent residents (LPR): 1956–2005

Sources: Statistical Yearbook of the Immigration and Naturalization Service, 1965, 1970, 1985; Yearbook of Immigration Statistics, 2000, 2005. Table "Immigrants admitted by sex and age."

pleasure” visas rather than any other type of temporary visa. In other words, they come as tourists or in order to visit kin. Indeed, some older adults visit regularly for extended periods and are an integral part of immigrant households (Treas and Mazumdar 2002, 2004).

Third, people not only immigrate into the country but they also emigrate out.

The U.S. keeps no official records of those who leave to return to their homeland or to move on to another country. Canadian longitudinal data, on the other hand, show quite high levels of return and out migration, particularly among entrepreneurs and highly skilled workers (Aydemir and Robinson 2006). Perhaps because they have usually been settled in the U.S. for many years, older immigrants appear to be less likely than younger ones to move again. Recent estimates suggest that 3.8 per cent of all immigrants emigrate annually from the U.S. but the figure is only 1.7 per cent for immigrants who are 65 or older (Van Hook et al. 2003). Analyses of Social Security beneficiaries indicate that older adults who qualify for Social Security benefits and then emigrate tend to be those who arrived late in their working careers and, thus, spent a relatively short amount of time in the U.S. (Duleep 1994).

Comparative Perspectives

Although the U.S. makes family reunification the cornerstone of its immigration system, Canada, Australia and many European countries give priority to other kinds of immigrants. With their emphasis on labor migration, Canada, Australia, New Zealand and the United Kingdom view immigration as an important means to offset the aging of their populations and to increase their country’s human capital. These countries have points systems for permanent immigration that reward youthful age and high educational attainment (Papadimitriou et al. 2007). About two-thirds of arriving immigrants in Canada and Australia are young, skilled and educated labor migrants (and their dependents). Two-thirds of newly admitted immigrants in the U.S. are family members, including older adults (Batalova 2006). Of course, family reunification and acceptance of refugees are important components of Australian and Canadian immigration policy as well and most family migrants arriving to the U.S. are not

older adults. Nonetheless, the U.S., Australia and Canada are traditional immigrant destinations that will face different issues of incorporation because of the different compositions of their newly arriving immigrants.

Unlike Australia, Canada and the U.S., many European countries until recently were either countries of emigration themselves (Italy, Portugal) or had an implicit policy of allowing as few permanent immigrants as possible (the United Kingdom, Germany). The “guest” workers who arrived in great numbers from Italy, Yugoslavia and later from Turkey to rebuild the post-war German economy are a telling example. The “guest” worker program was developed in an era of high labor demand to bring foreign workers for a limited period of time and to promote circular migration of the workforce. The ideological thinking behind this policy (i.e., keeping Germany a nation of common ethnicity) afforded few rights of permanent settlement, citizenship, or family sponsorship to guest workers who remained in Germany or to their German-born children. Since 1990, Germany has reversed its course and introduced a number of policies to promote social, economic and political integration of all of its non-German citizens but today’s focus of German immigration strategy is not on family reunification but rather on recruitment of the highly skilled (Papadimitriou et al. 2007). Similarly, France passed a law in 2006 that encourages high-skilled immigration while placing further restrictions on family reunification. The United States immigration priorities are in stark contrast with these other Western countries, which, in turn, leads to a different age mix in these countries’ immigrant populations.

Consistent with a greater emphasis in U.S. immigration policy on family reunification, older adults figure more prominently among arriving immigrants in the U.S. than in other developed countries, both in absolute and relative terms. In 2005, immigrants, ages 65 and older, made up 4.4 per cent of U.S. new permanent residents – a share nearly twice as high as in Australia (2.3 per cent in 2005), Canada (2.3 per cent in 2004), Germany (1.9 per cent in 2003) and the United Kingdom (2.5 per cent ages 60 and older in 2004) (MPI Data Hub, n.d.). The age structure of arriving immigrants differs for these immigrant-receiving countries but in the long-run, they will all find themselves in the same boat. They will be managing the graying of immigrant (and native) populations thanks to the fact that nearly everyone turns 65 sooner or later.

Diversity of Foreign-Born Older Adults

In generalizing about older immigrants, we run the danger of overlooking the remarkable variations within this population. One theme running throughout this chapter, for example, is how different elderly newcomers are from older immigrants who have lived in the U.S. for many years. Diversity extends to the geographic location of older immigrants. Some are densely clustered in states that have long been immigrant gateways and others live in states where immigrants are only a small share of the older population. Changing immigrant flows have led to greater ethnic and racial diversity in the general population and the older population is projected to mirror this diversity in coming decades. Lastly, there is the age composition of the older immigrant population where older newcomers stand out for being comparatively youthful.

California and Hawaii where older immigrants already constituted 20 per cent or more of the older population in 2000. By contrast, throughout much of the Midwest and Southeast U.S., less than 5 per cent of older adults were foreign born (see Fig. 16.5).

The surprising development in recent decades was the movement of young immigrants to destinations in the heartland of America where they had not previously had a substantial presence (Durand et al. 2000; Singer et al. 2008). The demand for low-skilled labor and the lower cost of living attracted immigrants to places such as South Carolina, Arkansas, Georgia and Kentucky. Undoubtedly, immigrants' share of the older population will continue to rise in traditional enclaves like California. Looking to the future, however, new destinations will also confront challenges of a diverse population of elderly immigrants as the newcomers in their communities settle there permanently and grow older.

Geographic Distribution

As noted previously, immigrants' share of the older population is certain to increase, perhaps reaching 20 per cent of all Americans aged 65 and older by the middle of the 21st century. Older immigrants, however, are not spread uniformly across the United States. Instead, they are clustered in certain states that historically attracted newcomers from abroad. As a consequence, the future is now in states such as New York,

Race and Ethnicity

Although immigrants came largely from European origins during most of U.S. history, the 1965 U.S. immigration law eliminated the legal barriers to immigration from Asia, Latin America and Africa. Now immigrants arrive largely from these parts of the world. The results of the post-1965 immigration have already left their mark on the racial and ethnic composition of the general population. In 2000, there were about as many

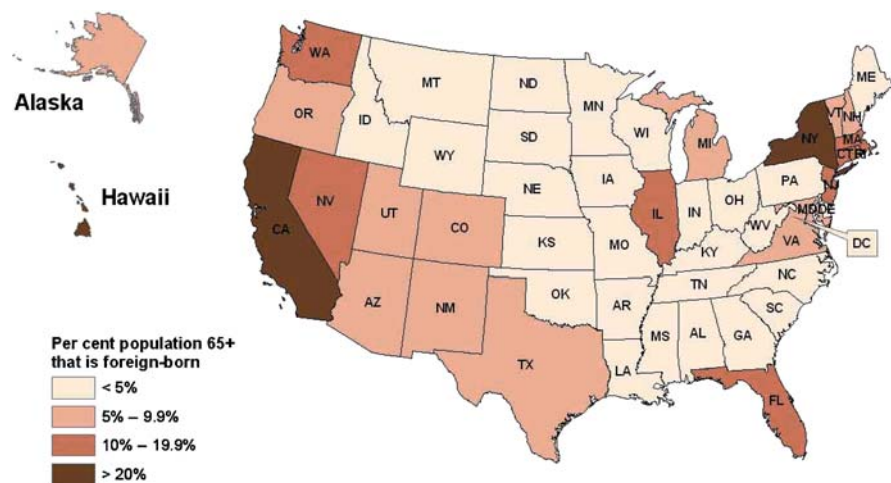


Fig. 16.5 Foreign-born share (per cent) of population, 65 and older, by state: 2000

Source: US Bureau of Census, Census 2000 5 Per cent PUMS

Hispanics as African-Americans in the U.S. population (U.S. Census Bureau 2004). According to projections for 2050, there will be three times more Hispanics and Asians than African-Americans; non-Hispanic whites will constitute only half of the total U.S. population.

Although non-Hispanic whites make up most of the native-born population, they are not a majority among the foreign-born. Instead, the younger immigrant population has large shares of Asians and Hispanics who will age to become older immigrants. Together with the comparatively modest numbers of older people who immigrate to the U.S. each year, these younger adults will translate into a smaller percentage of older immigrants who are non-Hispanic whites and a larger per cent who are Asians and Hispanics. It is this post-1965 wave of immigrants who today sponsor the immigration of their middle-aged and aging parents to the U.S.

Comparing the top ten countries of origin for the parents of U.S. citizens admitted in 1970 and 2004 is instructive. In 1970, five European countries (Italy, Greece, the UK, Portugal and Germany) totaled nearly 40 per cent of all admitted parents (see Table 16.1). Parents from Mexico represented another 5.7 per cent. By 2004, however, Mexico was the dominant source, accounting for 29.3 per cent of all parents who were admitted to permanent residency. In dramatic contrast to the earlier period, no European country ranked among the ten leading countries in 2004. Account-

ing for another 7.8 per cent in 2004 were three other Western Hemisphere countries – Dominican Republic, Colombia and Haiti. With 29 per cent of admitted parents, Asian countries – India, China, the Philippines, Vietnam and Korea – made up most of the rest.

With the overall immigrant population becoming more racially and ethnically diverse, it is not surprising that projections suggest increasing diversity for the older population of immigrants as well (Fig.16.6). Among the foreign-born who are 65 and older, the share of non-Hispanic whites is projected to drop from 47.6 per cent in 2000 to 20.2 in 2050. By 2015, Hispanics could supplant non-Hispanic whites as the largest group of immigrant seniors and non-Hispanic Asians could outnumber non-Hispanic whites among older immigrants by 2025. By 2050, Hispanics are projected to make up 41.5 per cent of foreign-born persons, 65 and older. Non-Hispanic Asian and Pacific Islanders are projected to constitute 29.7 per cent, non-Hispanic whites 20.2 per cent and non-Hispanic blacks 8.4 per cent.

Age Structure of Older Immigrants

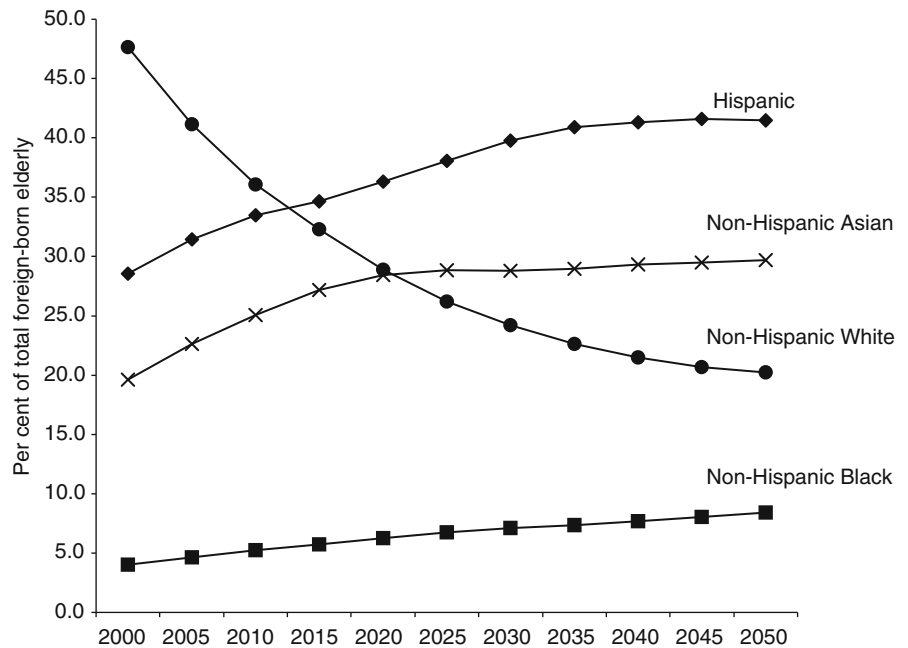
One obvious distinction in the older population is that recent immigrants are younger, reflecting the fact that immigration is selective of individuals who are

Table 16.1 Top ten countries of birth: parents of U.S. citizens admitted in 1970 and 2004

	1970			2004	
	Number	Per cent		Number	Per cent
Italy	1,644	17.8	Mexico	22,725	29.3
China	815	8.8	India	6,599	8.5
Greece	639	6.9	China	6,489	8.4
Philippines	604	6.5	Philippines	6,314	8.1
Mexico	524	5.7	Dominican Republic	2,473	3.2
United Kingdom	520	5.6	Colombia	1,962	2.5
Cuba	457	5.0	Vietnam	1,635	2.1
Portugal	454	4.9	Iran	1,627	2.1
Germany	309	3.4	Haiti	1,611	2.1
Turkey	268	2.9	Korea	1,472	1.9
All other countries	2,989	32.4	All other countries	24,627	31.8
Total	9,223	100.0	Total	77,534	100.0

Source: U.S. Department of Justice, Immigration and Naturalization Service, The Annual Report of the U.S. Immigration and Naturalization Service, for 1970. Table 6. "Immigrants Admitted by Classes Under the Immigration Laws and Country of Birth"; U.S. Department of Homeland Security, Yearbook of Immigration Statistics 2004. Table 8. "Immigrants Admitted by Selected Class of Admission and Region and Country of Birth, Fiscal Year 2004". Washington, D.C., U.S. Government Printing Office.

Fig. 16.6 Racial and ethnic composition of foreign-born persons, 65 and older, 2000–2050



Source: U.S. Census Bureau. 2003. National Population Projections. "Projections of the Foreign-Born Population by Age, Sex, Race, and Hispanic Origin: Lowest, Middle, and Highest Series, 1999 to 2100." Available at <http://www.census.gov/population/www/projections/natdet.html>

(comparatively) young and healthy. Figure 16.7 shows data for the year 2000. Older native-born males and long-term male residents (immigrating before 1990) were very similar in terms of their age distributions: slightly more than one-half were 65–74, one-third

were 75–84 and one-tenth were 85 years of age and older. The age distribution for older male newcomers (who arrived after 1989) was skewed toward the “young-old.” Fully 70 per cent were 65–74, 25 per cent were 75–84 and only 5 per cent were octoge-

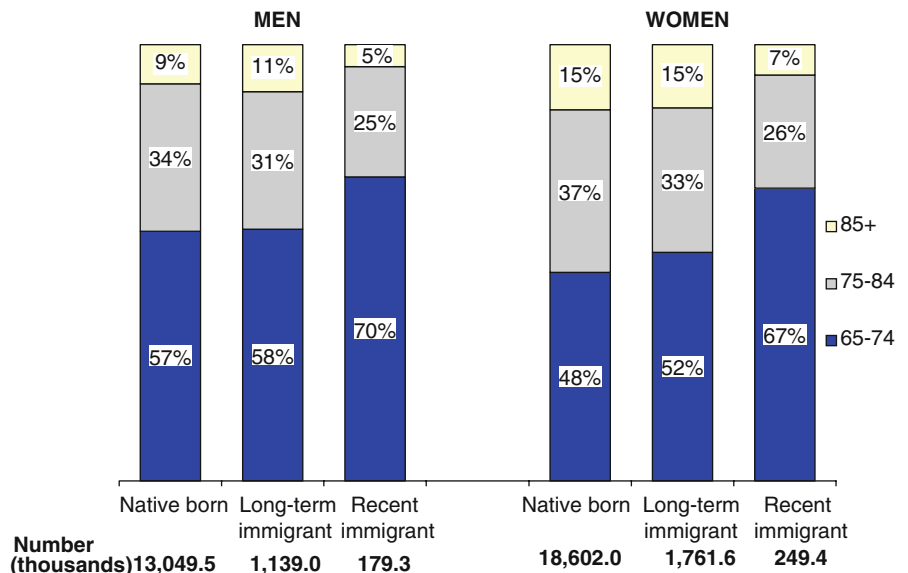


Fig. 16.7 Age distribution of natives, long-term and recent immigrants, 65 and older, by sex: 2000

Source: Authors' analysis of the US Census 2000.

narians or older. Similarly, recent immigrant women, 65 and older, were younger than either their native or long-term immigrant counterparts. Given sex differentials in life expectancy, there are more older women than older men in each nativity group and a higher per cent of women than men are 85 years of age or older.

Economic Incorporation of Immigrants

Among today's older adults are immigrants who arrived as children and young adults. Over their lifetimes, these long-term residents manage largely to overcome any initial disadvantages. Their situation in retirement looks very much like that of the native-born population although some groups (e.g., Mexican immigrants) face more of a struggle in old age as a consequence of being less educated and having lower earnings during their working years. Late-life immigrants, however, confront unique problems that mean that they are less well incorporated and their adjustment less successful. Furthermore, it is not certain whether future cohorts of immigrants can achieve the same level of security in retirement as today's older immigrants, if only because they face less welcoming immigration and welfare policies as well as an economy with fewer opportunities for low-skilled labor. To evaluate their integration processes, we consider immigrants' participation in the labor force and their economic well-being.

Labor Force Participation

Immigrants play an increasingly important role in the American economy. The number of immigrants engaged in the U.S. labor force reached a historic high of 22 million in 2005. These immigrant workers represent nearly 15 per cent of the total labor force compared to only 5 per cent in 1970. If the current level of immigration to the United States continues, immigrants may make up between one-third and one-half of the growth of the U.S. labor force through 2030 (Lowell et al. 2006; Mosisa 2006). Although foreign-born women are less likely than other American women to be employed, foreign-born men have,

if anything, higher rates of labor force participation than their native counterparts (Mosisa 2002). Even among the retirement-age population, 55 and older, these immigrants are more likely to work than other older adults in their racial-ethnic group (Mosisa 2002). The exception is the non-Hispanic white population, because the foreign-born in this group, dating from earlier immigration waves, tend to be older. Because immigrants have lower retirement incomes, their earnings are particularly important income sources. Among persons 65 and older, earnings constituted 34 per cent of total personal income in 1999 for persons arriving in the past decade, 24 per cent for earlier arrivals and only 16 per cent for the native-born (Treas and Batalova 2007).

The immigrant workforce in the U.S. is extraordinarily diverse, ranging from unskilled laborers to highly trained professional and technical workers (Batalova 2006). The foreign-born population, 25 and older, is as likely to have graduated from college as the U.S. born population. Reflecting the large number of immigrants from Mexico and Latin America, the foreign-born population is also two-and-a-half times as likely to have no high school diploma (Bean et al. 2004). Given generally lower educational attainments, the median earnings of full-time, foreign-born workers trail those of their native-born counterparts but natives earn more even within educational categories (Mosisa 2002). Immigrants narrow the earnings gap over the course of their careers as they gain more job experience in the U.S. but the wages of new immigrants have fallen behind those of other Americans over recent decades (Borjas 1985; Butcher and Dinardo 2002; Enchautegui 1998). Their deteriorating economic position has been ascribed variously to stagnation in the minimum wage (Butcher and Dinardo 2002), discrimination against Hispanics by employers fearful of IRCA sanctions for hiring undocumented workers (Bansak and Raphael 2001; Donato and Massey 1993) and the declining educational quality of new immigrants (Borjas 1985). Similar deterioration in the relative earnings of immigrants, especially newcomers, in Canada has been attributed to their changing characteristics but also to declines in the economic returns to their education (Picot 2004; Picot and Sweetman 2005). This development suggests that today's immigrants could have lower incomes than natives throughout their lives.

Work and Retirement Income

The workforce incorporation of immigrants has significant implications for their economic well-being in old age. Major sources of retirement income, namely, Social Security and employer pensions, are tied directly to employment (or to the status as family dependent of someone employed). Although the Social Security benefit formula is mildly progressive, working more years at higher wages under Social Security translates to higher Social Security income in retirement. Immigrant workers are over-represented in low-wage jobs (Enchautegui 1998), which tend to be short on benefits such as pension plans and health insurance. Some work in the informal economy, where employer pension plans are lacking and employment often goes unreported to Social Security. Given their employment experience, public pension eligibility rules have worked against immigrants, as observed not only for the U.S. but also for Canada (Boyd 1989). Of course, low-wage workers and immigrants do not necessarily know whether their job holds the promise of a financially secure retirement. Even controlling for factors like education and seniority, Canadian workers who had immigrated within the last decade demonstrated considerable confusion about their private pension eligibility – often reporting participating in retirement plans that their employers denied having (Morissette and Zhang 2004).

Immigrants who arrive late in their work careers and clock little or no time in U.S. employment are especially unlikely to be eligible for Social Security or employer pensions. For Americans 65 and older, almost one-third of total personal income in 1999 came from Social Security. By contrast, Social Security made up only 18 per cent of total income for older adults immigrating in the 1990s. The foreign-born seniors were also disadvantaged in terms of employer pensions. These pensions accounted for 23 per cent of the total income in 1999 of the native-born older adults as compared with 16 per cent for older adults who were long-term foreign-born residents of the United States and only 11 per cent for those immigrating after 1989 (Treas and Batalova 2007). New immigrants' ineligibility for employment-based economic support is not unique to the U.S., of course. In Sweden, immigrants who arrived earlier are more likely to draw early retirement pensions awarded to those with reduced work

capacity while later arrivals are reduced to relying on social assistance (Hammarstedt 2000).

Economic Well-being in Old Age

Less likely to work or to translate working into retirement benefits, older immigrants, particularly recent immigrants, are more likely to be counted among the poor than are other older Americans. Census 2000 revealed that 14 per cent of immigrants, 65 and older, were below the poverty line in 1999 as compared to 9 per cent of other older Americans (He 2002). Among older adults who were not citizens, fully 19 per cent fell below the poverty line. Men are at considerably less risk of poverty in the general population of older Americans, in part, because they are usually part of a married couple and couples are favored over singles by the Social Security benefit formula. Gender, however, confers much less of an advantage in the immigrant population where men's poverty rates approach women's.

Lower incomes over the work life also limit the extent to which individuals can save for their old age. For the population aged 65 and older, 1999 income from assets (e.g., interest-earning bank accounts) constituted only 11 per cent of the total income of post-1989 immigrants as opposed to 22 per cent for earlier immigrants and 23 per cent for the native-born population (Treas and Batalova 2007). Because the biggest asset for most Americans is the home they own, home ownership indicates how older immigrants have fared in accumulating assets. According to Census 2000, 82 per cent of native-born persons who were aged 65 and older lived in a home that they or someone else in the household owned. So did 72 per cent of long-term immigrants but only 48 per cent of newcomers, that is, older adults immigrating in the 1990s, lived in an owner-occupied home (Treas and Batalova 2007). There is a considerable variation among older immigrants of different origins in terms of home ownership. Census 2000 data suggest that among older immigrants who arrived in the last decade from the former Soviet Union, only 11 per cent lived in owner-occupied houses, perhaps because their status as refugees made them eligible for subsidized rental housing. In contrast, 85 per cent of older immigrants from Canada lived in owner-occupied housing. Cuban, Mexican and Chinese

seniors who were recent immigrants fell in between with figures of 43, 56 and 61 per cent, respectively.

Having low incomes and limited assets, immigrants were more likely than other older adults in 2000 to report relying on social welfare programs for support in later life. Despite legislation aimed at reducing immigrants' eligibility, 13 per cent of naturalized citizens, 65 and older, and 24 per cent of older noncitizens received cash welfare benefits in contrast to only 5 per cent of the older native-born population. Older people, especially immigrants who had not naturalized, were even more dependent on non-cash programs like food stamps, Medicaid and housing assistance; 46 per cent of noncitizens, 21 per cent of naturalized citizens and 14 per cent of natives reported that they participated in these programs (He 2002).

Emigration and Retirement Income

An interesting, if neglected, topic is what happens to immigrant workers who emigrate – returning to their countries of origin when they retire. The U.N. International Convention on the Protection of the Rights of Migrant Workers and Members of their Families requires that member states implement policies to promote equal treatment of migrants and nationals with respect to social security as well as health and social services (Paparella 2004). Having a long history of immigration, the U.S. has an extensive system of bilateral, reciprocal agreements with a number of other countries that guarantee pension rights of foreign workers. That there were 431,000 Social Security beneficiaries abroad who were retired or disabled workers, their survivors and dependents suggests the international reach of these agreements (U.S. Census Bureau 2005).

Research in Mexico shows how U.S. emigrants benefit. Compared to other Mexicans, the likelihood of receiving a pension of some sort is higher for older Mexicans who were labor migrants to the U.S., especially for those who had longer U.S. work experience (Ross et al. 2006; Sana and Massey 2000). These older adults are more financially secure, because employment opportunities permit them to acquire assets to cushion their retirement. On the other hand, given the lack of portability in health benefits, older people

in Mexico who worked many years in the U.S. are less likely to have health insurance (Ross et al. 2006).

Despite some multi-national initiatives to standardize the treatment of migrant workers in the European Union, a number of regulatory shortcomings in implementing non-discriminatory pension treatment have been identified for member states (Dwyer and Papadimitriou 2006; Paparella 2004). These include tying benefits to citizenship from which migrants are largely excluded, conditioning benefits on the length of legal residence or type of residence permit and failing to specify minimum contributions necessary to access coverage.

Social Aspects of Immigrant Incorporation

Besides the economic dimension, the incorporation of immigrants precedes along other lines as well. Naturalization, discussed above, is an indicator of social incorporation, one with considerable economic ramifications. Being able to speak English fluently is another facet of social incorporation that permits immigrants to better understand and navigate life in the U.S. As an indicator of preferences and constraints, living arrangements offer an additional perspective on how older immigrants accommodate to new circumstances.

English Language Proficiency

The ability to speak the language of the host country is often taken as a key measure of acculturation, opening up economic opportunities and making it easier to make one's way in a new society. In the year 2000, 4.4 million Americans, 65 and older, reported speaking a language other than English and 2.3 million indicated that they did not speak English "very well" (U.S. Census Bureau 2006). Spanish, the most common foreign language, was spoken by 1.7 million older adults, including one million who reported having only limited English fluency. Net of other factors, Spanish speakers are generally less likely to master English than those speaking other languages (Carliner 2000; Stevens 1999). In the population aged 65 and older, however, Spanish-speakers are not the least likely to

be fluent in English. Fully 72.4 per cent of older adults speaking Asian and Pacific Island languages reported that they did not speak English at least “very well” as compared to 61.5 per cent who spoke Spanish and 40.1 per cent who spoke other Indo-European languages (U.S. Census Bureau 2006). These differences reflect, in part, the fact that Asian language speakers are relative newcomers compared to the other groups due to the highly restrictive U.S. laws barring Asian immigration before 1965.

On indicators of incorporation and well-being, however, there is a big distinction not only between native-born and foreign-born but also between those seniors who immigrated decades ago and those seniors who are more recent arrivals. This is evident in the languages they speak at home and their English language ability.

English language proficiency increases with time in the U.S. and the sharpest gains occur in the ten years following arrival (Stevens 1999). The Census 2000 data on language confirm that earlier immigrants have greater English language proficiency than newcomers. Given their longer time in the U.S. and their more heavily European origins, immigrants aged 65 and older who arrived before 1990 were more likely than newcomers to say that they spoke only English (Table 16.2). According to our analysis of Census 2000 data, among

these long-term older immigrants, 31 per cent spoke “English only,” another 22 per cent reported speaking it “very well,” while the remaining 47 per cent were defined as limited English proficient or LEP (i.e., speaking English less than “very well”). By contrast, only 11 per cent of those who arrived more recently spoke English only while another 11 per cent spoke it “very well”. The remaining 78 per cent were LEP. If they spoke languages other than English in the home, recent immigrants typically pointed to European languages, particularly Spanish followed by Russian. Asian or Middle-Eastern languages were more likely to be reported for recent arrivals than long-term immigrants.

Even considering the duration of residence in the U.S., the older one is when immigrating, the less proficient one is likely to be in English. Going to school or working in the labor force – activities only infrequently pursued by older immigrants – increase proficiency. Since the age effect persists even when involvement in these activities is controlled, developmental and biological constraints probably figure in language acquisition (Stevens 1999). While older immigrants say that they would like to speak English better, they lament the difficulty in learning a new language at an older age (Treas and Mazumdar 2002). While they note structural constraints (such as being too busy with

Table 16.2 Languages spoken in homes of older adults, 65 and older: 2000

Native born		Long-term immigrants		Recent immigrants	
English only	93.6		31.1		11.4
Of languages other than English spoken at home:					
Spanish	43.2	Spanish	34.7	Spanish	27.9
Italian	10.5	German	8.7	Russian	15.4
French	10.4	Italian	7.3	Chinese	8.9
German	7.2	Chinese	5.7	Tagalog	8.8
Polish	6.6	Tagalog	5.0	Vietnamese	5.9
Japanese	2.7	French	3.8	Korean	2.6
Yiddish	2.3	Polish	2.9	Persian	2.4
Greek	2.0	Korean	2.5	Armenian	1.9
Portuguese	1.2	Russian	2.3	Arabic	1.6
Czech	1.1	Greek	2.1	French Creole	1.6
Other languages	12.9	Other languages	25.0	Other languages	23.1
Total languages other than English	100.0	Total languages other than English	100.0	Total languages other than English	100.0

Source: Authors' analysis of Census 2000.

household responsibilities to attend English classes), they also point to age-related difficulties ranging from forgetfulness to dentures.

Speaking English has been shown to have significant ramifications for the lives of older immigrants. All things considered, English language proficiency seems to permit older Mexican immigrants to head their own households, rather than living in the homes of others (Burr and Mutchler 2003). The importance of English, however, depends on the community context. English fluency is a weaker predictor of independent living in places with high concentrations of Hispanics, presumably because it is possible to get along speaking only Spanish in an ethnic enclave. The language used by older adults also affects others. Having a non-English speaking older relation influences the language usage of other household members. Grandchildren who live with a grandparent, especially a grandmother, who does not speak English are more likely to retain their grandparent's language (Ishizawa 2004). This may represent an important advantage, because bilingual children do better in school than their monolingual counterparts.

In addition to an individual's language proficiency, the Census 2000 data allow us to determine linguistically isolated households – those where all members, ages 14 and above, have only limited English proficiency. We use this census definition of linguistic isolation and focus on the ability of family members to communicate in English. Older immigrants who immigrated in the prior decade are more likely to live in linguistically isolated households than their long-term counterparts: 43.4 per cent of recent elderly immigrants live in such households compared to 26.9 per cent of long-term older immigrants. People who are not English proficient often rely on others in their households to translate and help negotiate the English-speaking environment. Disability, retirement and the loss of age-mates reduce older adults' contacts outside the household and, thus, their sources of information and language assistance. The problems associated with having a poor command of English for an older person are apt to be exacerbated if all the others in their household struggle with English as well. Relatives may not be able to communicate satisfactorily with, say, government agencies and health care providers on behalf of their elderly family member.

Living Arrangements

Living arrangements offer further evidence of incorporation. The overwhelming majority of older Americans live independently, that is, either alone or with only their spouse (Treas 1995). Compared to their U.S.-born counterparts, older immigrants, particularly those from developing countries, are much less likely to live independently and much more likely to make their homes with other family members (Kritz et al. 2000; Wilmoth et al. 1997).

Older immigrants are not only apt to share living arrangements but they are also apt to be dependent on others for housing. When they live with kin, older immigrants are usually the "guest" in someone else's home (Angel et al. 2000; Treas and Batalova 2003; Wilmoth et al. 1997). When older non-immigrants live in multigenerational households, they are usually the householder (that is, the person in whose name the dwelling is owned or rented) or they are the householder's spouse (Treas and Batalova 2003). In other words, older non-immigrants usually provide housing to a younger generation, rather than vice versa. Living in the child's home is strongly associated with depending on the child for financial support, too (Glick and Van Hook 2002).

Newcomers are more likely to share housing than are those who have lived in the U.S. for many years. According to Census 2000 data, fully 87 per cent of older native-born adults were the householder or the spouse of the householder, as were 78 per cent of the long-term, older immigrants arriving before 1990, compared to only 41 per cent of older newcomers. In contrast, nearly half of the post-1989 immigrants, 65 and older, lived with their children as "guests" compared to 4 per cent among the native-born and 15 per cent among earlier immigrants.

At the same time, the living arrangements of older adults differ by place of origin (Glick and Van Hook 2002). According to our analyses of U.S. Census 2000 data on post 1989 immigrants, Mexicans, 65 and older, have the greatest likelihood of living as guests with their children (62 per cent). About 10 per cent live with other relatives and roughly 5 per cent live with non-relatives. In contrast, virtually all Canadian seniors reported being the householder or the householder's spouse (92 per cent) and hardly any

resided as guests with their children or other relatives (4 per cent). Half of older Cubans were householders and 30 per cent were living in their children's homes. Cubans, however, have a particularly high propensity to live in the homes of other relatives (12 per cent). Similar to Mexicans, 57 per cent of Chinese seniors live with their children as non-householder guests and another 4 per cent live with other relatives. Among post-1989 Soviet elderly, nearly 80 per cent were the householder or spouse while only 7 per cent live with their children as guests.

In short, there is considerable variation in older immigrants' living arrangements depending on time lived in the U.S. and on origin group. In general, older foreign-born Americans are less likely to live independently and more likely to live with children and others than native-born Americans. Explaining the differences between immigrants and natives and between various immigrant groups presents considerable challenge. One explanation focuses on cultural factors that shape preferences for particular household arrangements. Another approach emphasizes the set of factors that constrain the choice of living arrangements. The two perspectives are not mutually exclusive, however, and comprehensive research controlling for economic resources, acculturation, functional resources and population composition does not completely close the gap between immigrants and other older adults (Wilmoth et al. 1997).

Cultural Influences on Living Arrangements

In their extended living arrangements, older immigrants parallel younger immigrants, who are also more likely to share housing with others besides a spouse and/or minor children. This has contributed to the idea that immigrants' *cultural preferences* affect their choice of living arrangements. Indeed, the differences in living arrangements between immigrant groups from various origins are sometimes cited as evidence for cultural influences (Wilmoth 2001). Cultural preferences are seldom measured directly but rather they are inferred from measures of acculturation (like English-language proficiency or duration of residence in the U.S.) or from the size of the unexplained residual in multivariate models where other factors are controlled. There

is, however, some evidence for inter-group differences in attitudinal support for multigenerational living. Hispanics are significantly more likely than non-Hispanic whites to "strongly agree" that grown children should make their living arrangements with their parents (25.7 per cent vs 15.8 per cent) and should provide them with financial aid (26.5 per cent versus 19.3 per cent) (Burr and Mutchler 1999).

The cultural argument is based on the generalization that extended family living (that is, living with adult children, grandchildren, other relatives and non-relatives) is more common in Latin America, Africa and Asia than in Northern America and Europe (U.N. Department of Economic and Social Affairs Population Division 2005). According to U.N. estimates, nearly three-quarters of adults, 60 and older, in Africa and Asia live with their children and/or grandchildren, as do nearly two-third of seniors in Latin America and the Caribbean. By contrast, only a quarter of their European counterparts reside with a younger generation of family members. Europeans are three times as likely to live alone or to live as an independent couple than are older adults in the other regions (U.N. Department of Economic and Social Affairs Population Division 2005).

Although even traditionally filial societies have seen a decline in support for multigenerational residence (Hsu et al. 2001; U.N. Department of Economic and Social Affairs Population Division 2005), there are marked disparities in rates of multigenerational co-residence even among Western industrialized countries (Farkas and Hogan 1995; Hank 2007; Treas and Cohen 2006). For women whose mothers are still alive, the per cent co-residing with the mother ranges from a scant 4 per cent in Sweden and 8 per cent in the U.S. to 24 per cent in Austria and 38 per cent in Italy (Treas and Cohen 2006). Countries where adult children live with mothers are also places where children who do not co-reside visit more frequently.

Co-Residence as Necessity

It is difficult to determine how large a role culture plays in the household arrangements of immigrants, because both the economic and social need to co-reside and the cultural preferences for co-residence typically decline

with incorporation into the host society. To explain why immigrants are more likely to live with kin, researchers have found it useful to consider extended living arrangements as a matter of *practical necessity*. Multigenerational living, for example, is a convenient way to address the needs of older adults who need financial support, companionship, help with daily activities and English language assistance. There is considerable evidence to support the idea of living arrangements as a creative immigrant response to necessity, that is, to the new circumstances of immigrant life (Treas 1999). For example, researchers have emphasized that immigrant households are constituted strategically to maximize resources and to meet particular needs, such as supporting the elderly, caring for the young, or providing co-ethnic companionship (Kibria 1993; Phua et al. 2001).

Kin availability obviously facilitates extended family living arrangements (Soldo et al. 1990). Indeed, older female immigrants who have had more children are more likely to co-reside, both in the U.S. (Wilmoth 2001) and Canada (Boyd 1991). However, even immigrants without the “right mix” of close kin living in the U.S. create complex households that contain boarders, distant relatives, or fictive kin in order to fill domestic functions and make ends meet (Lan 2002). Viewing household composition as a survival strategy points out that dependent older family members in immigrant households also make contributions – perhaps keeping house, minding grandchildren, earning small sums of money from recycling or home sewing, or bringing in modest SSI payments when nobody else qualifies for government assistance (Treas and Mazumdar 2004).

Not surprisingly, residential independence is associated with the amount of time that immigrants have been in the host country. As noted above, immigrants of longer duration become more like the native-born population in terms of their economic resources and language proficiency. Of course, the longer one is in the U.S., the more likely one is to have naturalized or otherwise become eligible for social service programs and economic benefits, including housing assistance. Older Chinese and Mexican immigrants who have naturalized are considerably more likely to live on their own than immigrants who are not U.S. citizens (Lee and Angel 2002).

Immigrating at older ages increases the likelihood of dependence on other family members in both the U.S. (J. L. Angel et al. 2000; R. J. Angel et al. 1999) and Canada (Boyd 1991). Consistent with their lower

receipt of private pensions and Social Security, Mexican-Americans who moved to the U.S. after age 50 are more likely to live with their children and depend on them for financial support than are Mexican-Americans who were born in the U.S. or immigrated at a younger age (R. J. Angel et al. 1999).

Having lower income generally decreases the likelihood of older immigrants living independently while having less than a college education increases the odds of living in another family member’s household, at least for older foreign-born males (Wilmoth 2001). Lower income and less education similarly influence the living arrangements of older women in Canada (Boyd 1991). Ethnic group differences in multigenerational living among older immigrants to Canada are explained, in part, by differences in income and in the receipt of old-age support (Basavarajappa 1998).

Unmarried immigrant women are at a particularly high risk of dependent living situations (Wilmoth 2001). According to data from Census 2000, however, older immigrants were much like other Americans their age in terms of marital status. With figures that approximate their native-born counterparts, 46 per cent of foreign-born women, 65 and older, were widowed, as opposed to 40 per cent who were married. Wives typically outlive their husbands because of lower female mortality and because women tend to marry men who are older. The burden of widowhood falls disproportionately on women. Only 13 per cent of older, foreign-born men were widowed, while 76 per cent remain married – similar to other older men in the United States.

Perhaps because disability increases the need for assistance with everyday living for those who lack a spouse to help out, physical limitations raise the likelihood that unmarried older immigrants live in the homes of other family members (Wilmoth 2001). For Mexican-Americans immigrating after the age of 50, declining health increases the odds of moving in with other family members, rather than having them move in with the older adult (J. L. Angel et al. 2000).

Limited English-language proficiency is another factor that encourages older immigrants to live with family members who can offer everyday companionship and broker the English language when needed. Among older immigrants from Mexico, for instance, English language fluency contributes to living independently and being the head of the household (Burr and Mutchler 2003). In Canada, stronger English and

French language skills are associated with independent residence for older immigrant women (Boyd 1991).

Macro-Level Influences

Whether an older immigrant adult or couple lives independently or resides with others is not solely a function of the needs, resources and preferences of the older adult and his or her family members. Local communities can buffer the effect on living arrangements of limited resources or high needs. Even controlling for various socioeconomic, demographic, cultural and health variables, Korean-Americans, 60 and older, were more likely to live independently in Los Angeles and Chicago than in New York City (J. Kim and Lauderdale 2002). Two differences in the communities were associated with independent living. First, greater availability of public housing apparently mitigated the housing constraints posed by low income. Second, more Korean-owned businesses probably reduced the need to rely on kin for culture-brokering and English translation. Similarly, research on older Mexican immigrants finds that limited English proficiency is less an impediment to residential autonomy in communities with high concentrations of co-ethnics (Burr and Mutchler 2003).

Welfare policies that determine which older immigrants have access to income and housing assistance may also figure in their choice of living arrangements. During the 1990s, reforms in welfare and immigration laws that limited even legal immigrants' access to public health and welfare benefits were expected to undermine the ability of low-income older immigrants to maintain health (Jean-Baptiste 1999) and residential independence (R.J. Angel et al. 1999; Treas 1997; Wilmoth et al. 1997). Indeed, eligibility for public welfare programs has been identified as a major factor behind older immigrants' autonomous living arrangements (P.G. Min 1998; Sung and Kim 2002).

Health and Well-Being

Health is a concern to persons of all ages. Poor health and the disabilities associated with poor health are

most prominent among older adults, however. Being more likely to have a chronic health condition, older adults are the biggest users of health care services. Furthermore, persons 65 and older account for three quarters of all deaths in advanced industrial societies like the U.S. (Treas 1995). Thus, any consideration of older immigrants would be incomplete without consideration of their physical and emotional health and well-being. Older immigrants seem to have an elevated risk for mental distress and depression, at least if they immigrate late in life. Their relative physical health is a more complex question. There is some surprising evidence that immigrants are healthier than other Americans. At issue is whether this immigrant or Hispanic paradox represents real social processes or flawed data.

Mental Health

Those who immigrate late in life face considerable stress in adapting to their new circumstances. Their challenges are not the same as those confronted by younger immigrants (nor by older immigrants who, having arrived as children or younger adults, are now generally well incorporated into the host society) (Gold 1989; Treas and Mazumdar 2002, 2004). For example, older newcomers to the U.S. may never master English, if only because older adults do not have the developmentally-related cognitive receptiveness for new languages that their grandchildren have. They arrive when they are too old for the socializing influences of the school and the workplace where younger immigrants make new friends, become acquainted with the culture and learn a new language. As a consequence, their adaptation and acculturation is slower and more problematic. They are less likely to feel fully at home in the host society (Becker 2002). In addition, they sustain more losses than younger people. The immigrant experience means that they find themselves far from old friends and familiar places (Becker 2002; Treas and Mazumdar 2002). Having built a career and a reputation over a lifetime, they may see their occupational and social status plummet in a new community (Gold 1995; Remennick 2003a). Even in their own families, they must often defer to younger family members who control the resources and who are more familiar with social institutions and customs of

the host society (To 1999; Treas and Mazumdar 2002). Older immigrants can also anticipate the age-related losses confronting other older adults – disability, widowhood, decreased mobility.

Some older immigrants have suffered unusual traumas that hinder not only their short-run, but also their long-term, adjustment. By definition, refugees have left another country because they have a well-founded fear of being persecuted for reasons of race, religion, nationality, membership in a particular social group, or political opinion. Others have experienced the terror of war or natural disaster. This trauma may be compounded by losses such as the death of loved ones and the exile from a homeland. The effects of severe trauma can be very long-lasting and refugee survivors who are older are at greater risk of mental disorders, including post-traumatic stress disorders and major depression (Marshall et al. 2005). Although demographic statistics on refugees are often incomplete, persons, ages 60 or older, made up 6 per cent of refugees, asylum-seekers, returned refugees, internally displaced and stateless persons at the end of 2004, according to the United Nations High Commissioner for Refugees (United Nations High Commissioner for Refugees 2006). In some places, such as states of the former Yugoslavia, the figure was closer to 20 per cent. U.S. law recognizes the difficult circumstances that refugees and asylees face not only by designating a special visa category for them but also by granting them seven years of means-tested social welfare benefits, such as SSI and Medicaid, which are not available to other newcomers.

Given their greater challenges and more limited resources, it is not surprising to find that the well-being of older immigrants is compromised by high rates of depression, loneliness and mental distress (Black et al. 1998; González et al. 2001; Krause and Goldenhar 1992; Mui 1996). Older Soviet Jews, for example, are at greater risk of demoralization than their younger counterparts not only in the U.S. but also in Israel (Aroian et al. 1998; Flaherty et al. 1988); those confronting more new and unfamiliar situations, greater language difficulties and more personal losses are the most distressed. Although both older non-Hispanic whites and older Korean immigrants in the U.S. are troubled by age-related changes such as declines in health status, Korean immigrants were found to be significantly more depressed both at the initial interview and at a one-year follow-up (J.W. Min et al.

2005). Compared to U.S.-born middle-aged and older adults, immigrants who lived alone experienced greater depression but the mental health of immigrants living with others also suffered compared to immigrants living with a spouse (Wilmoth and Chen 2003). Although ethnic attachments may yield social supports that buffer loneliness (O. Kim 1999; J.W. Min et al. 2005), less acculturated immigrants suffer more psychological difficulties than those who are better incorporated into their new society. Less acculturated Mexicans were at higher risk for depression even after controlling for socioeconomic, psychosocial, behavioral and health variables (Cuellar et al. 2004; González et al. 2001).

Health and Mortality

The health status of older immigrants has not been well-documented. Given a research focus on children, adolescents and young adult immigrants, there is only limited information on how middle-aged and older immigrants fare even on the ten leading health indicators (e.g., obesity, access to care, mental health) that motivate public health efforts in the U.S. (Kandula et al. 2004). The health status of younger adults is a poor proxy for the circumstances of their seniors. Although the prevalence of mental illness is lower among immigrants than among the U.S.-born population (Kandula et al. 2004), older immigrants, especially those immigrating late in life, appear to be at high risk of depression and other mental disorders, as discussed above. Unfortunately, much of what is known about older immigrants is inferred from studies of the ethnic and racial differences in health among the elderly. Typically, this work has been incomplete or even misleading, because it has failed both to distinguish immigrants from native-born persons within the various racial/ethnic populations and to attend to the variations in national origin among racial and ethnic categories (Gaines et al. 1999). Of course, the failure to address the remarkable diversity within the immigrant population is not unique to studies of health; it characterizes research on socioeconomic incorporation of immigrants as well (Waters and Jimenez 2005).

Although the immigrant population is younger than the U.S.-born population, many characteristics of immigrants put them at greater risk of morbidity and

mortality. Health conditions in their country of origin expose them to risks that may lead to disease later in life. In Latin America and the Caribbean, for example, older adults report high rates of diabetes (Barcelo et al. 2006; Palloni and McEniry 2006), a condition that can be linked to their poor nutritional status in early childhood (Palloni et al. 2006). In their host country, immigrants confront health risks associated with lower incomes and barriers to health care (Callahan et al. 2006; Lucas et al. 2003; Zanchetta and Poureslami 2006). Surprisingly, given these disadvantages, immigrants have been found to be healthier than their native-born counterparts in America (Antecol and Bedard 2006), Canada (Gee et al. 2004; McDonald and Kennedy 2004) and Sweden (Pudarcic et al. 2003). This advantage is termed the “immigrant mortality paradox.” Considerable research has focused on understanding the health status of immigrants, both in terms of risks and protective factors.

Immigrant Disadvantage

Immigrants typically come from less developed societies where access to modern health care is limited. Because of longer exposure to health risks in the homeland, those who immigrate at older ages may be at even greater risk for particular health problems than those who immigrate at younger ages. For example, high consumption of traditional Arabic foods has been linked with diabetes; all things considered, Arab Americans who immigrated at a later age are more likely to develop diabetes, perhaps because of longer exposure to those traditional foods associated with the disease (Jaber et al. 2003). A study of older Chinatown immigrants, 50 and older, reports that women’s bone density is lower for immigrants than for their U.S.-born counterparts; more recent immigrants have lower bone density than those who arrived earlier, thus, placing them at greater risk of disabling bone fractures (Lauderdale et al. 2003).

Compared to others in the host society, immigrants have lower incomes, which – given a socioeconomic gradient in health – increases their risk of disease. There is some debate as to whether immigrants and Hispanics display the same positive correlation between health and socioeconomic status as non-immigrants and non-Hispanic whites (Cagney and Lauderdale 2002; Levin

and Markides 1985; Steffen 2006). Nonetheless, immigrants are certainly more likely to confront economic, legal, cultural, linguistic and other barriers to getting regular health care (Callahan et al. 2006; Choi 2006; Kandula et al. 2004; Lucas et al. 2003; Zanchetta and Poureslami 2006).

Among older Americans, 12 per cent of immigrants had no health insurance in 1997 as compared to only 1 per cent of older non-immigrants (Carrasquillo et al. 2000). Consistent with 1996 welfare reform legislation that barred most new immigrants from Medicaid, older adults who have been in the U.S. fewer than five years are much more likely to be uninsured than those who have lived longer in the U.S. (Choi 2006). Without insurance, immigrants have limited access to quality health care and utilize fewer services, including preventive medicine. Controlling for demographic factors such as age and income, the gap between immigrants and non-immigrants in access to health services is greater in the U.S. than in Canada, a country that offers universal health care (Lasser et al. 2006). Of course, the smaller health gap may relate to differences in immigrant origins and period of arrival, rather than merely to differences in health care systems.

Not having health insurance clearly influences the care that immigrants get. Lacking private “medigap” insurance that more affluent seniors purchase to offset the co-payments and other uncovered expenses of Medicare, older Hispanic immigrants in the U.S. make fewer visits to health care providers and are less likely to say that they have a usual source of care (R. J. Angel et al. 2002). Some of these immigrants go to Mexico in order to obtain medical care. A lack of health insurance similarly deters older men from Salvador from getting cancer screenings (Ratnasinghe et al. 1999). For older Korean immigrants, Medicaid coverage is critical for choosing formal over informal (i.e., family) care in the hypothetical event of a disabling condition, such as a stroke or hip fracture (Min 2005). Cultural and linguistic factors are also barriers to health care for older immigrants. In Israel, economic considerations are not an impediment, because routine breast examinations are free but older women from the Soviet Union do not seek preventative screenings due to such factors as ignorance, fear, fatalism and limited Hebrew language skills (Remennick 2003b). In the U.S., Bosnian immigrants report that they find American health care wanting on a number of counts, including the ease of

access, its impersonal and bureaucratic nature and the difficulty of understanding insurance coverage (Seawright 2003).

Health Advantage

Despite unique health risks and obstacles to accessing health care, immigrants in the U.S. seem to be healthier than native-born persons. Adjusting for broad age groups, foreign-born adults are generally less likely to have diabetes, hypertension and cardiovascular diseases than others in their racial-ethnic group (Dey and Lucas 2006). Among those 55 and older, immigrants are less likely to report fair-to-poor health and health-related activity limitations, especially when socioeconomic status is controlled (Heron et al. 2006). All things considered, the propensity to report good health seems to increase with time in the U.S., suggesting that factors such as English language facility may influence self-evaluations and reporting (Jasso 2004).

Lower death rates have been found for immigrants in all broad racial-ethnic groups (Hummer et al. 1999) but it is the “Hispanic paradox” in mortality that has received the most attention from researchers (Elo et al. 2004; Franzini et al. 2001; Hummer et al. 1999, 2004; Markides and Eschbach 2005; Palloni and Arias 2004). Although the Hispanic category includes U.S.-born persons as well as immigrants, immigration is critical to efforts to understand the paradox of a low-income population with death rates lower than those of non-Hispanic whites.

Because lower Hispanic death rates are so unexpected, the adequacy of the data must be questioned. Issues of data quality are central to efforts to establish that there is, in fact, a Hispanic mortality advantage and to assess its magnitude (Markides and Eschbach 2005; Palloni and Arias 2004). Mortality rates based on vital records, that is, death certificates, exaggerate the Hispanic advantage to the extent that they undercount Hispanic deaths or overstate the size of the Hispanic population vis a vis other racial and ethnic groups. Estimates based on vital statistics (i.e., death certificates) are problematic because of: 1) difficulty in accurately estimating the size of the Hispanic population used in the death rate denominator (Elo et al. 2004); 2) misclassification of the decedent’s ethnicity on death certificates used for the

death rate numerator (Smith and Bradshaw 2006); 3) a numerator-denominator population mismatch due to differences in ethnicity determination methods (i.e., reports by funeral directors for death certificates versus census self-identification for the population at risk) (Smith and Bradshaw 2006) and 4) age misreporting.

Older adults are known to be especially prone to discrepancies between their age as given on death certificates and in Social Security records and Hispanics also tend to overstate their age, especially at older ages (Kesterbaum 1992; Rosenwaik 1991). Age reporting inconsistencies are not limited to the U.S., of course, having also been reported for Latin America (Dechter and Preston 1997). The consequence of age overstatement is to overestimate the older population and, thus, to underestimate Hispanic mortality rates at older ages. The upshot is to inflate the Hispanic mortality advantage.

To sidestep population undercounts, age reporting errors, the underreporting of Hispanic ethnicity on death certificates and the biases in different ways of determining ethnicity, Elo and associates (Elo et al. 2004) eschewed vital records. Instead, they analyzed linked administrative data from Medicare and Social Security. They used information on Spanish names, county of residence and place of birth to categorize individuals with missing data as being Hispanic or not. For the 1990s, the ratio of age-specific death rates for older Hispanics to non-Hispanic whites ranged from 0.86 to 0.89 for women and from 0.82 to 0.87 for men. In short, “better” data produces higher estimates of mortality for older Hispanics, thus reducing but not eliminating, the Hispanic mortality advantage. Other researchers who have made separate studies of Hispanic ethnicity in Texas (Smith and Bradshaw 2006) and California (Eschbach et al. 2006) go so far as to conclude that all of the Hispanic mortality advantage – at least for some subgroups – can be explained by problems of Hispanic ethnicity on death certificates.

Pairing national survey data with follow-up mortality data from the National Death Index also eliminates the need to use ethnicity information from death certificates. This approach, too, confirms that older Hispanics have lower death rates than older non-Hispanic whites but, again, the difference is smaller than estimated with vital rates (Hummer et al. 2004). It is difficult to generalize about mortality, morbidity and health care usage of immigrants, particularly

Hispanics, because of the diversity of the population (Baluja et al. 2003; Weinick et al. 2004). Linked data, however, permit consideration of finer categories of Hispanic ethnicity. The results indicate that the Hispanic mortality advantage is limited to Mexicans and to a heterogeneous “Other Hispanic” category (Hummer et al. 1999; Palloni and Arias 2004). Older Mexican immigrants display a particular advantage vis a vis U.S.-born Mexican-Americans. Despite subgroup differences, Palloni and Arias (2004) found no evidence that the Hispanic mortality paradox is merely an artifact of the data.

Explaining the Mortality Paradox

Improvements in data quality reduce the Hispanic mortality advantage but they do not eliminate it. Thus, other theories have emerged as explanations of this mortality paradox. These theories explicitly recognize the importance of immigration to the Hispanic population. A “cultural” explanation emphasizes that immigrant lifestyles and community social networks are protective of health but that these health benefits decline as immigrants and their children gradually adopt the unhealthy behavior of other Americans. According to this explanation, those who are acculturated will be sicker than those who are not, because they have acquired more risk factors for chronic disease. Other explanations for the Hispanic mortality paradox focus on the selective nature of immigration. On the one hand, immigrants will be healthier than the general population, because sick people are less likely to move, given the rigors of immigration and the fact that employment is a usual motive for relocating. This “healthy immigrant” hypothesis argues that the selection of the healthiest individuals into the immigrant population inflates the immigrant mortality advantage vis a vis U.S.-born counterparts. On the other hand, immigrants who do become sick in the U.S. are apt to return home to die – a so-called “salmon” effect. Since their demise is not observed in U.S. data, Hispanic mortality rates here are reduced.

Supporting cultural explanations, rates of smoking and obesity – risk factors for many chronic conditions – are lower for foreign-born adults than for the U.S.-born members of their race-ethnic group (Baluja et al. 2003; Dey and Lucas 2006; Heron et al.

2006). Furthermore, longer time in the U.S. increases some risk factors, consistent with the idea of a gradual acculturation of healthy immigrants. Hispanic immigrants who had been in the U.S. fifteen years or longer were almost four times more likely to be obese than newcomers arriving in the last five years – even after controlling for a host of variables, including physical activity, chronic conditions, functional limitations, psychological distress, access to health services, age and other socio-demographic characteristics (Antecol and Bedard 2006; Kaplan et al. 2004). On measures such as self-reported health, health conditions and activity limitations, new immigrants are healthier than U.S.-born members of their racial-ethnic group but those who have been in the U.S. longer show less of a health advantage (Antecol and Bedard 2006). Of course, duration of time in the U.S. is only an indirect measure of acculturation and direct measures are often lacking in the research literature. One direct measure, having an American or bicultural identity, was found to be associated with greater fat intake (but also greater physical activity) among Asian Indians, 50 and older (Jonnalagadda and Diwan 2005).

Palloni and Arias (2004), however, dismissed cultural explanations for the Hispanic mortality paradox. At the county-level, high ethnic concentration might be expected to maintain any health-promoting benefits of immigrants’ native culture and to insulate ethnic group members against unhealthy American behaviors. Ethnic concentration, however, has only weak effects that cannot explain why Hispanics live longer than non-Hispanic Whites. In fact, any benefits of residing near co-ethnics seem to derive from immigrant, not ethnic, concentration (Bond Hauie et al. 2002). If immigrants are subject to strong selective forces such as the “healthy immigrant” effect, any protective cultural effects will be difficult to sort out. Nor do data on older Asian immigrants support the acculturation hypothesis. Nearly all older Japanese-Americans were born in the U.S. but their mortality advantage vis a vis older whites is no less than that for Asian groups dominated by immigrants (Lauderdale and Kestenbaum 2002).

Evidence of a “healthy immigrant” effect is also weak. Immigrants who have been in the U.S. longer do not show the decline in mortality advantage that would be anticipated if acculturation were driving race, ethnic and nativity differentials in death rates (Palloni and Arias 2004). Nor do Mexican immigrants residing farther away from Mexico (and presumably subject to the

strongest selection for good health) show lower mortality than their counterparts who live on the border. Considering the “salmon effect” hypothesis, however, Palloni and Arias (2004) found support for selective out-migration. The mortality advantage increases for older Mexicans, a superannuated group that is apt to suffer more health problems and the immigrant origin group for whom emigration is most feasible, given the proximity of Mexico. The other Hispanic category – a mixed group that includes immigrants from more remote homelands (e.g., South Americans) – do not show this age patterning. Also supporting a “salmon effect” is the fact that longitudinal data from the National Immigrant Survey find that immigrants interviewed at two points in time report slightly better health than those who were lost to the second interview (Jasso 2004).

Conclusions

The U.S. and other countries that have experienced high levels of immigration in previous decades have already seen changes in the composition of their general populations as the ranks of the foreign-born have grown. Similar changes will occur in the composition of their older populations to the extent that younger immigrants grow old in their host societies. In the U.S., the future promises an older population that contains more immigrants, both numerically and proportionately. In keeping with new immigration flows resulting from 1965 changes in U.S. immigration laws, the older population will be more ethnically and racially diverse as well.

To date, immigrants who arrived in the U.S. as children or young adults have been incorporated rather successfully. With the exception of groups who were very disadvantaged in terms of human capital (e.g., Mexicans with low educational attainments), immigrants have largely closed the economic gap with the native-born by the time they retire. In terms of, say, income or the receipt of Social Security, they are almost as well off as native-born seniors. The same cannot be said of older adults who have immigrated late in life. Because they do not acquire labor force experience or English language fluency, they remain dependent on their families for their economic support and housing.

Nor can young immigrants arriving today be counted on to traverse the pathway to secure retire-

ments that characterized earlier generations. There are troubling indications that the newcomers are starting out at more of an income disadvantage vis a vis the native-born than did immigrants who came before. The context of reception has changed, not merely in terms of the economy, which offers fewer opportunities for the low-skilled but also in terms of the safety net, which affords fewer protections to newcomers. These are changes that affect all Americans but changes in immigration and welfare law have presented more significant barriers to public benefits for newly arriving immigrants. Other aspects of immigration law are apt to contribute to the growth of a foreign-born population of Americans who are not economically secure in old age. These include welcoming the aged parents of naturalized citizens, tough border enforcement discouraging return migration and the uncertainty of the situation of the 12 million undocumented persons who have virtually no route to legal status in the absence of a large-scale legalization program. Leaving aside moral and political reasons for the legalization itself, policy makers will face tough financial choices as well. For example, should the seven million undocumented workers – who contribute annually roughly \$7 billion in Social Security contributions and \$1.5 billion in Medicare taxes (Porter 2005) – have a claim on these contributions once they are able to legalize their status and reach retirement age? While U.S. law requires mandatory Social Security payments regardless of the citizenship of the worker or employer, workers have to provide proof of their contributions to the system, which could be quite a challenge for those who have worked under false identities or false social security numbers (Meyers 2004).

The implications of immigration for the older population in the future hinge, in part, on the uncertain course of the economy and public policy. A regrettable lack of research on immigrant aging contributes to the uncertainty surrounding the status of older immigrants in the years ahead. (For a rare overview of the issues of immigration and aging, see Treas and Torres-Gil (2009)). Given that relatively few individuals immigrate late in life, we can project the numbers and background characteristics of older immigrants in coming decades based on the numbers and backgrounds of younger immigrants today. We can be less certain of their socio-economic status. As the discussion of the “immigrant paradox” in mortality makes clear, how-

ever, efforts to understand the health implications of an aging foreign-born population are frustrated by the population's diversity, by serious limitations in data and by our lack of understanding of basic processes of immigration (e.g., selection) and incorporation (e.g., acculturation to life styles of the host society). What is called for is research that can address both basic demographic and social processes and the exceptional circumstances that confront older foreign-born adults.

References

- Angel JL, Angel RJ, Markides KS (2000) Late-life immigration, changes in living arrangements, and headship status among older Mexican-origin individuals. *Soc Sci Q* 81:389–403
- Angel RJ, Angel JL, Lee G-Y, Markides KS (1999) Age at migration and family dependency among older Mexican immigrants: Recent evidence from the Mexican American EPESE. *Gerontologist* 39:59–65
- Angel RJ, Angel JL, Markides KS (2002) Stability and change in health insurance among older Mexican Americans: Longitudinal evidence from the Hispanic Established Populations for Epidemiologic Studies of the Elderly. *Am J Public Health* 92:1264–1271
- Antecol H, Bedard K (2006) Unhealthy assimilation: Why do immigrants converge to American health status levels? *Demography* 43:337–360
- Aroian KJ, Norris AE, Patsdaughter CA, Tran TV (1998) Predicting psychological distress among former Soviet immigrants. *Int J Soc Psychiatry* 44:284–294
- Aydemir A, Robinson C (2006) Return and onward migration among working age men. Ottawa, Statistics Canada
- Baluja KF, Park J, Myers D (2003) Inclusion of immigrant status in smoking prevalence statistics. *Am J Public Health* 93:642–646
- Bansak C, Raphael S (2001) Immigration reform and the earnings of Latino workers: Do employer sanctions cause discrimination? *Ind Labor Relat Rev* 54(2):275–295
- Barcelo A, Pelaez M, Rodriguez-Wong L, Pastor-Valero M (2006) The prevalence of diagnosed diabetes among the elderly of seven cities in Latin America and the Caribbean: The health wellbeing and aging (SABE) project. *J Aging Health* 18:224–239
- Basavarajappa KG (1998) Living arrangements and residential overcrowding among older immigrants in Canada. *Asian Pac Migr J* 7:409–432
- Batalova J (2006) Skilled immigrant and native workers in the United States: The economic competition debate. LFB Scholarly Publishing LLC, New York
- Bean FD, Lee J, Batalova J, Leach M (2004) Immigration and fading color lines in America. Russell Sage, New York, NY
- Becker G (2002) Dying away from home: Quandaries of migration for elders in two ethnic groups. *J Gerontol B: Soc Sci* 57:S79–95
- Binstock RH, Jean-Baptiste R (1999) Elderly immigrants and the saga of welfare reform. *J Immigr Health* 1:31–40
- Black SA, Goodwin JS, Markides KS (1998) The association between chronic diseases and depressive symptomatology in older Mexican Americans. *J Gerontol A: Biol Sci Med Sci* 53(3):M188–194
- Bond Haue SA, Hummer RA, Rogers RG (2002) Individual and contextual risks of death among race and ethnic groups in the United States. *J Health Soc Behav* 43:359–381
- Borjas G (1985) Assimilation, changes in cohort quality, and the earnings of immigrants. *J Labor Econ* 3:463–489
- Borjas G, Hilton L (1995) Immigration and the welfare state: Immigrant participation in mainstream entitlement programs. National Bureau of Economic Research, Cambridge, MA
- Boyd M (1989) Immigration and income security policies in Canada: Implications for elderly immigrant women. *Popul Res Policy Rev* 8(1):5–24
- Boyd M (1991) Immigration and living arrangements: Elderly women in Canada. *Int Migr Rev* 25:4–27
- Bratsberg B, James F, Ragan J, Nasir ZM (2002) The effect of naturalization on wage growth: A panel study of young male immigrants. *J Labor Econ* 20:568–597
- Burr JA, Mutchler JE (1999) Race and ethnic variation in norms of filial responsibility among older persons. *J Marriage Fam* 61:674–687
- Burr JA, Mutchler JE (2003) English language skills, ethnic concentration, and household composition: Older Mexican immigrants. *J Gerontol: Soc Sci* 58:S83–92
- Butcher KF, Dinardo J (2002) The immigrant and native-born wage distributions: Evidence from United States censuses. *Ind Labor Relat Rev* 56(1):97–121
- Cagney KA, Lauderdale DS (2002) Education, wealth, and cognitive function in later life. *J Gerontol B Psychol Sci Soc Sci* 57(2):163–172
- Callahan ST, Hickson GB, Cooper WO (2006) Health care access of Hispanic young adults in the United States. *J Adolesc Health* 39:627–633
- Capps R, Fix M, Henderson E (2006) Trends in legal immigrants' public benefits use following welfare reform: An Update Paper presented at the Children and Families on the 10th Anniversary of Welfare Reform, Migration Policy Institute, Washington, DC
- Carliner G (2000) The language ability of U.S. immigrants: Assimilation and cohort effects. *Int Migr Rev* 34:158–182
- Carrasquillo O, Carrasquillo A, Shea S (2000) Health insurance coverage of immigrants living in the United States: Differences by citizenship status and country of origin. *Am J Public Health* 90:917–923
- Choi S (2006) Insurance status and health service utilization among newly-arrived older immigrants. *J Immigr Minor Health* 8:149–161
- Cornelius WA, Lewis JM (eds) (2006) Impacts of border enforcement on Mexican migration: The view from sending communities. Lynne Rienner Publishers and UCSD Center for Comparative Immigration Studies, Boulder, CO
- Cuellar I, Bastida E, Braccio SM (2004) Residency in the United States, subjective well-being, and depression in an older Mexican-origin sample. *J Aging Health* 16:447–466

- Dechter A, Preston SH (1997) Age misreporting and its effects on adult mortality estimates in Latin America. *Popul Bull, UN* 31–32:1–17
- Dey AN, Lucas JW (2006) Physical and mental health characteristics of U.S. and foreign-born adults: United States, 1998–2003. *Adv Data Vital Health Stat* 369:1–19
- Donato KM, Massey DS (1993) Effect of the immigration reform and control act on the wages of Mexican migrants. *Soc Sci Q* 74(3):523–541
- Duleep HO (1994) Social Security and the emigration of immigrants. *Soc Secur Bull* 57:37–52
- Durand J, Massey DS, Charvet F (2000) The changing geography of Mexican immigration to the United States: 1910–1996. *Soc Sci Q* 81:1–15
- Dwyer P, Papadimitriou D (2006) The social security rights of older international migrants in the European Union. *J Ethn Migr Stud* 32:1301–1313
- Elo IT, Turra CM, Kestenbaum B, Ferguson RF (2004) Mortality among elderly hispanics in the United States: Past evidence and new results. *Demography* 41:109–128
- Enchautegui ME (1998) Low-skilled immigrants and the changing American labor market. *Popul Dev Rev* 24(4):811–824
- Eschbach K, Kuo YF, Goodwin JS (2006) Ascertainment of Hispanic ethnicity on California death certificates: Implications for the explanation of the Hispanic mortality advantage. *Am J Public Health* 96:2209–2215
- Estes CL, Goldberg S, Wellin C, Linkins KW, Shostak S, Beard RL (2006) Implications of welfare reform on the elderly: A case study of provider, advocate, and consumer perspectives. *J Aging Soc Policy* 18:41–63
- Farkas JI, Hogan DP (1995) The demography of changing intergenerational relations. In: Bengtson VL, Schaie KW, Burton LM (eds), *Adult intergenerational relations: Effects of societal change*, Springer Publishing Company, New York, pp 1–25
- Fix M, Passel J (2002) *The scope and impact of welfare reform's immigrant provisions*. The Urban Institute, Washington, DC
- Flaherty JA, Kohn R, Levav I, Birz S (1988) Demoralization in Soviet-Jewish immigrants to the United States and Israel. *Compar Psychiatry* 29:588–597
- Franzini L, Ribble JC, Keddie AM (2001) Understanding the Hispanic paradox. *Ethn Dis* 11:496–518
- Gaines AD, McDonald PE, Wykle ML (1999) Aging and immigration: Who are the elderly? *J Immigr Health* 1:99–113
- Gee EM, Kobayashi KM, Prus SG (2004) Examining the healthy immigrant effect in mid- to later life: Findings from the Canadian Community Health Survey. *Can J Aging* 23: S61–69
- Glick JE, Van Hook J (2002) Parent's coresidence with adult children: Can immigration explain racial and ethnic variation? *J Marriage Fam* 64:240–253
- Gold SJ (1989) Differential adjustment among new immigrant family members. *J Contemp Ethnogr* 17:408–434
- Gold SJ (1995) *From the worker's state to the golden state: Jews from the former Soviet Union in California*. Allyn Bacon, Boston, MA
- González HM, Haan MN, Hinton L (2001) Acculturation and the prevalence of depression in older Mexican Americans: Baseline results of the sacramento area latino study on aging. *J Am Geriatric Soc* 49:948–953
- Hagan J, Rodriguez N, Capps R, Kabiri N (2003) The effects of recent welfare and immigration reforms on immigrants' access to health care. *Int Migrat Rev* 37(2(142)):444–463
- Hammar T (1985) *European immigration policy: A comparative study*. Cambridge University Press, Cambridge, UK
- Hammarstedt M (2000) The receipt of transfer payments by immigrants in Sweden. *Int Migrat* 38:239–268
- Hank K (2007) Proximity and contacts between older parents and their children: A European comparison. *J Marriage Fam* 69:157–173
- He W (2002) The older foreign-born population in the United States: 2000 (No. P 23–211). Census Bureau, Washington, DC, U.S
- Heron MP, Schoeni RF, Morales LS (2006) Health status of older immigrants in the United States. Rand, Santa Monica, CA
- Hirst D (1932) Is citizenship a fair requirement in old age assistance acts? *Social Forces* 11:109–112
- Hsu H-C, Lew-Ting C-Y, Wu S-C (2001) Age, period, and cohort effects on the attitude toward supporting parents in Taiwan. *Gerontologist* 41:742–750
- Hu W-Y (1997) Elderly immigrants on welfare. *J Human Res* 33:711–741
- Hummer RA, Benjamins MR, Rogers RG (2004) Racial and ethnic disparities in health and mortality among the US elderly population. In: Bulatao RA, Anderson NB (eds) *Understanding racial and ethnic differences in health in late life: A research agenda*. National Academy Press, Washington, DC
- Hummer RA, Rogers RG, Nam CB, LeClere FB (1999) Race/ethnicity, nativity, and U.S. adult mortality. *Soc Sci Q* 80:136–153
- Ishizawa H (2004) Minority language use among grandchildren in multigenerational households. *Sociol Perspect* 47:465–483
- Jaber LA, Brown MB, Hammad A., Zhu Q, Herman WH (2003) Lack of acculturation is a risk factor for diabetes in Arab immigrants in the US. *Diabetes Care* 26:2010–2014
- Jasso G (2004) Migration, human development, and the life course. In: Mortimer JT, Shanahan MJ (eds) *Handbook of the life course*. Springer, New York
- Jean-Baptiste RHB (1999) Elderly immigrants and the saga of welfare reform. *J Immigr Health* 1:31–40
- Jonnalagadda SS, Diwan S (2005) Health behaviors, chronic disease prevalence and self-rated health of older Asian Indian immigrants in the U.S. *J Immigr Health* 7:75–83
- Kandula NR, Kersey M, Lurie N (2004) Assuring the health of immigrants: What the leading health indicators tell us. *Ann Rev Public Health* 25(1):357–376
- Kaplan MS, Hugué N, Newsom JT, McFarland BH (2004) The association between length of residence and obesity among Hispanic immigrants. *Am J Prev Med* 27:323–326
- Kesterbaum B (1992) A description of the extreme aged population based on improved Medicare enrollment data. *Demography* 29:565–580
- Kibria N (1993) *Family tightrope: The changing lives of Vietnamese Americans*. Princeton University Press, Princeton, NJ
- Kim J, Lauderdale DS (2002) The role of community context in immigrant elderly living arrangements: Korean American elderly. *Res Aging* 24:630–653
- Kim O (1999) Mediation effect of social support between ethnic attachment and loneliness in older Korean immigrants. *Res Nursing Health* 22(2):169–175

- Krause N, Goldenhar LM (1992) Acculturation and psychological distress in three groups of elderly Hispanics. *J Gerontol* 47(6):S279–288
- Kritz MM, Gurak DT, Chen L (2000) Elderly immigrants: Their composition and living arrangements. *J Sociol Social Welfare* 27:85–114
- Lan P-C (2002) Subcontracting filial piety: Elder care in ethnic Chinese immigrant families in California. *J Fam Issues* 23:812–835
- Lasser KE, Himmelstein DU, Woolhandler S (2006) Access to care, health status, and health disparities in the United States and Canada: Results of a cross-national population-based survey. *Am J Public Health* 96:1300–1307
- Lauderdale DS, Kestenbaum B (2002) Morality rates of elderly Asian American populations based on Medicare and Social Security data. *Demography* 39:529–540
- Lauderdale DS, Kuohung V, Chang S-L, Chin MH (2003) Identifying older Chinese immigrants at high risk for osteoporosis. *J Gen Intern Med* 18:508
- Lee G.-Y, Angel RJ (2002) Living arrangements and supplemental security income use among elderly Asians and Hispanics in the United States: The role of nativity and citizenship. *J Ethnic Migrat Stud* 28:553–563
- Levin JS, Markides KS (1985) Socioeconomic status and infant mortality among Hispanics in a southwestern city. *Soc Biol* 32(1–2):61–64
- Lowell BL, Gelatt J, Batalova J (2006) Immigrants and labor force trends: The future, past, and present. Retrieved January 20 2006
- Lucas JW, Barr-Anderson DJ, Kington RS (2003) Health status, health insurance, and health care utilization patterns of immigrant black men. *Am J Public Health* 93:1740–1747
- Markides KS, Eschbach K (2005) Aging, migration, and mortality: Current status of research on the Hispanic paradox. *J Gerontol B: Soc Sci* 60:68–75
- Marshall GN, Schell TL, Elliott MN, Berthold SM, Chun CA (2005) Mental health of Cambodian refugees 2 decades after resettlement in the United States. *J Am Med Assoc* 294:571–579
- McDonald JT, Kennedy S (2004) Insights into the ‘healthy immigrant effect’: Health status and health service use of immigrants to Canada. *Soc Sci Med* 59:1613–2167
- Meissner D, Meyers D, Papademetriou D, Fix M (2006) Immigration and New America’s future: A new chapter. Retrieved December 20, 2006 from <http://www.migrationpolicy.org/ITFIAF/index.php>
- Meyers D (2004, January 4, 2007) International Agreements of the Social Security Administration from <http://www.migrationpolicy.org/pubs/MPI%20Fact%20Sheet-International%20Agreements%20of%20the%20SSA.FS.pdf>
- Migration Policy Institute (n.d.) Country resources. Migration Information Source. Retrieved December 10, 2007 from [http://www.migrationinformation.org/Resources/#europe?xml.namespaceprefix=0ns=""um.schemas-microsoft-com:office.office/](http://www.migrationinformation.org/Resources/#europe?xml.namespaceprefix=0ns=)
- Min JW (2005) Preference for long-term care arrangement and its correlates for older Korean Americans. *J Aging Health* 3:363–395
- Min JW, Moon A, Lubben JE (2005) Determinants of psychological distress over time among older Korean immigrants and Non-Hispanic white elders: Evidence from a two-wave panel study. *Aging Mental Health* 9:210–222
- Min PG (1998) Changes and conflicts: Korean immigrant families in New York. Boston: Allyn Bacon
- Morissette R, Zhang X (2004) Pension plan awareness. *Perspect Labour Income* (Spring) 37–44
- Mosisa AT (2002) The role of foreign-born workers in the U.S. economy. *Mon Labor Rev* 125(5):3–14
- Mosisa AT (2006) Foreign-born workforce, 2004: A visual essay. *Mon Labor Rev* 129(7):48–55
- MPI Data Hub. (n.d.) Country and comparative data tool. Retrieved February 7, 2007 from <http://www.migrationinformation.org/datahub/comparative.cfm>
- Mui AC (1996) Depression among elderly Chinese immigrants: An exploratory study. *Social Work* 41(6):633–645
- Palloni A, Arias E (2004) Paradox lost: Explaining the hispanic adult mortality advantage. *Demography* 41:385–415
- Palloni A, McEniry M (2006) Aging and health status of elderly in Latin America and the Caribbean: Preliminary findings. *J Cross-Cultural Gerontol* 21:1–23
- Palloni A, McEniry M, Wong R, Pelaez M (2006) The tide to come: Elderly health in Latin America and the Caribbean. *J Aging Health* 18:180–206
- Papadimitriou D, Batalova J, Sommerville W (2007) Selecting immigrants effectively. Migration Policy Institute. Washington, DC
- Paparella D (2004, April 21–23) Social Security coverage for migrants: Critical aspects. Paper presented at the International Social Security Association European Regional Meeting on Migrants and Social Protection, Oslo
- Passel JS, Van Hook J, Bean FD (2004) Estimates of legal and unauthorized foreign born population for the United States and selected states, Based on Census 2000. Retrieved August 25, 2005 from http://www.sabresys.com/whitepapers/EMS_Deliverable_1_020305.pdf
- Phua VC, Kaufman G, Park KS (2001) Strategic adjustments of elderly Asian Americans: Living arrangements and headship. *J Comp Fam Stud* 32:263–281
- Picot G (2004) The deteriorating economic welfare of Canadian immigrants. *Can J Urban Res* 13:25–46
- Picot G, Sweetman A (2005) The deteriorating economic welfare of immigrants and possible causes: Update 2005. Statistics Canada, Ottawa
- Porter E (2005, April 5) Illegal immigrants are bolstering Social Security with billions. *New York Times*
- Pudarcic S, Sundquist J, Johansson SE (2003) Country of birth, instrumental activities of daily living, self-rated health and mortality: A Swedish population-based survey of people aged 55–74. *Soc Sci Med* 56:2493–2503
- Ratnasinghe D, Weed DL, Shankar S (1999) Cancer knowledge and misconceptions among immigrant Salvadorian men in the Washington, DC, Area. *J Immigr Health* 1:1096–4045
- Remennick L (2003a) Career continuity among immigrant professionals: Russian engineers in Israel. *J Ethnic Migrat Stud* 29:701–721
- Remennick L (2003b) “I have no time for potential troubles”: Russian immigrant women and breast cancer screening in Israel. *J Immigr Health* 5:153–163
- Rosenwaike I (1991) Mortality experience of Hispanic populations. In Rosenwaike I (ed) *Mortality of Hispanic populations*. Greenwood Press, New York

- Ross SJ, Pagan JA, Polsky D (2006) Access to health care for migrants returning to Mexico. *J Health Care Poor Underserved* 17:374–385
- Sana M, Massey DS (2000) Seeking Social Security: An alternative motivation for Mexico-US migration. *Int Migrat Rev* 38:3–24
- Seawright HR (2003) Bosnian immigrants' perceptions of the United States health care system: A qualitative interview study. *J Immigr Health* 5:87–93
- Singer A (2002) Immigrants, welfare reform and the coming reauthorization vote. *Migrat Inf Source* Retrieved November 15, 2006 from <http://www.migrationinformation.org/Feature/display.cfm?ID=40>
- Singer A, Hardwich S, Brettell C. (eds) (2008) *Twenty-first century gateways: Immigrant incorporation in suburban America*. Brooking Institution Press, New York
- Smith, DP, Bradshaw, BS (2006) Rethinking the Hispanic paradox: Death rates and life expectancy for US non-Hispanic white and Hispanic populations. *Am J Public Health* 96:1686–1692
- Soldo BJ, Wolf D, Agree E (1990) Families, households, and care arrangements of frail older women: A structural analysis. *J Gerontol: Soc Sci* 45:S238–S249
- Steffen PR (2006) The cultural gradient: Culture moderates the relationship between socioeconomic status (SES) and ambulatory blood pressure. *J Behav Med* 29(6):501–510
- Stevens G (1999) Age at immigration and second language proficiency among foreign-born adults. *Lang Soc* 28:555–578
- Sung K-T, Kim MH (2002) The effects of the U.S. welfare system upon elderly Korean immigrants' independent living arrangements. *J Poverty* 6:83–94
- To K (1999) Changing status and roles of older Korean immigrants in the United States. *Int J Aging Human Dev* 49:213–229
- Treas J (1995) Older Americans in the 1990s and beyond. *Popul Bull* 50(2):1–48
- Treas J (1997) Older immigrants and U.S. welfare reform. *Int J Sociol Social Policy* 17:8–33
- Treas J (1999) Diversity in American families. In: Moen P, Dempster-McClain D, Walker HA (eds) *A nation divided: Diversity, inequality and community in American society*, Cornell University Press, Ithaca, NY, pp 245–259
- Treas J, Batalova J (2003) Guests and hosts: Older immigrants in America's households. Paper presented at the Population Association of America meetings, Minneapolis, MN
- Treas J, Batalova J (2007) Older immigrants. In: Schaie KW, Uhlenberg P (ed), *Social structures: The impact of demographic changes on the well-being of older persons*. Springer Publishing Company, New York, pp 1–24
- Treas J, Cohen P (2006) Maternal co-residence and contact: Evidence from cross-national surveys. In: Gauthier AH, Chu CYC, Tuljapurkar S (eds) *Allocating public and private resources across generations: Riding the age waves*, vol. 2. Springer/Kluwer Academic Publishers, Dordrecht, Netherlands, pp 117–137
- Treas J, Mazumdar S (2002) Older people in America's immigrant families: Dilemmas of dependence, integration, and isolation. *J Aging Stud* 16:243–258
- Treas J, Mazumdar S (2004) Caregiving and kinkeeping: Contributions of older people to America's immigrant families. *J Comp Fam Stud* 35:105–122
- Treas J, Torres-Gil F (2009) Immigration and aging: The nexus of complexity and promise. *Generations* 33(1)
- U.N. Department of Economic and Social Affairs Population Division (2005) *Living arrangements of older persons around the world*
- U.S. Census Bureau (2004) U.S. interim projections by age, sex, race, and hispanic origin. Table 1A. Retrieved June 15, 2005 from <http://www.census.gov/ipc/www/usinterimproj/>
- U.S. Census Bureau (2005) *Statistical abstract of the United States: 2006* (125 edn., pp Table 53) Census Bureau, Washington, U.S.
- U.S. Census Bureau (2006) *America speaks: A demographic profile of foreign-language speakers for the United States: 2000* Retrieved December 1, 2006 from <http://www.census.gov/population/www/socdemo/hh-fam/AmSpks.html>
- U.S. Department of Homeland Security (2002) *Yearbook of immigration statistics* from <http://uscis.gov/graphics/shared/aboutus/statistics/ybpage.htm>
- U.S. Department of Homeland Security (2006) *Yearbook of immigration statistics 2005*. December 12, 2006 from <http://www.dhs.gov/ximgrn/statistics/publications/yearbook.shtm>
- United Nations High Commissioner for Refugees (2006) *2004 UNHCR statistical yearbook* (pp Table IV-1)
- Van Hook J, Brown SK, Bean FD (2006) For love or money? Welfare reform and immigrant naturalization. *Soc Forces* 85:1–25
- Van Hook J, Zhang W, Bean FD, Passel JS (2003) Foreign-born emigration: A new approach and estimates based on matched CPS files. *Demography* 46:361–382
- Waters MC, Jimenez TR (2005) Assessing immigrant assimilation: New empirical and theoretical challenges. *Annu Rev Sociol* 31(1):105–125
- Weinick RM, Jacobs EA, Stone LC, Ortega AN, Burstin H (2004) Hispanic healthcare disparities: Challenging the myth of a monolithic Hispanic population. *Med Care* 42(313–320)
- Wilmoth JM, De Jong G, Himes C (1997) Immigrant and non-immigrant living arrangements among America's white, Hispanic, and Asian elderly population. *Int J Sociol Soc Policy* 17:57–82
- Wilmoth JM (2001) Living arrangements among older immigrants in the United States. *Gerontologist* 41:228–238
- Wilmoth JM, Chen PC (2003) Immigrant status, living arrangements, and depressive symptoms among middle-aged and older adults. *J Gerontol B Psychol Sci Soc Sci* 58(5): S305–313
- Yang PQ (1994) Explaining immigrant naturalization. *Int Migrat Rev* 28:449–477
- Yoo GJ (2001) Constructing deservingness: Federal welfare reform, Supplemental Security Income, and elderly immigrants. *J Aging Soc Policy* 13:17–34
- Zanchetta MS, Poureslami IM (2006) Health literacy within the reality of immigrants' culture and language. *Can J Public Health* 97:S26–30

Chapter 17

Replacement Migration

Charles B. Keely

Introduction

There is an almost four-decades old literature focused on the substitution effects of migration for the demographic processes of fertility and mortality. On the simplest level, the question came down to whether international migration could be used to alter purportedly unacceptable population size or composition due to fertility and mortality rates. Policy concerns have not only been about absolute population size as achieved or reasonably projected but also about composition, especially age composition because age structure can affect growth from future fertility, the size of the labor force and dependency ratios. Migration, like differential fertility in an ethnically, racially or religiously mixed population, can also affect the composition of social characteristics in a population that impact political or social events and opportunities.

Over the last four decades, international migration has been looked to as: a possible policy lever for population control to offset rapid population growth in developing countries; a cause of unacceptable delay in achieving zero population growth in developed countries; and, in the more recent interest in migration, an antidote to the challenges of declining and aging populations in the developed world.

The demographic literature responding to these policy concerns focused on the dynamics of population growth and decline and their related composition outcomes. Attention has been paid not only to the size of the migration flow but also to the migration flow's own compositional characteristics, especially age structure.

Both the size and composition of migration flows can have effects on the size and composition of the population under study. The information of interest for policy consideration has been whether and to what extent migration might be called upon to alter the effects of past and projected fertility and mortality experiences. This literature used stable population theory, that is, the formal mathematical modeling about what happens when constant fertility, mortality and migration schedules are applied to a population over time.

The stable population literature traditionally had assumed closed populations, that is, populations without immigration or emigration. Such an assumption was quite realistic when dealing with global population, extraterrestrials being of little concern. On a country or regional level, such a simplifying assumption was more or less realistic depending on probabilities of migration in or out of the territory considered and the length of time used for projections and simulations (assuming that factors are more likely to change the further into the future one projects the population). The general conclusion that projections become less reliable predictions for the future the further out in time they extend is supported empirically by studies that have compared past projections by agencies such as the Population Division of the United Nations, the World Bank and the US Census Bureau with subsequent actual outcomes in populations (Bongaarts and Bulatao 2000).

An important contribution of the policy driven research on migration as a substitute for fertility or mortality has been the integration of migration into stable population theory and some analysis of the effects of both the size and age composition of migration streams on projection outcomes. The outcomes of interest include such things as the size, tempo of change and age structure of resulting populations.

C. B. Keely
Georgetown University
Washington, DC, USA
E-mail: keelyc@georgetown.edu

Therefore, policy questions have led to the refinement of formal, mathematical demography because the desired information to inform policy required theoretical and technical advances in the integration of migration as a demographic process interacting with fertility and mortality operating on a population.

This article will address the question of replacement migration for an aging population already declining in size, or on the path to decline, by tracing the development of demographic understanding of the role of migration in population dynamics. (Throughout this article I will refer simply to aging populations but include in that phrase the idea that the aging is due to past fertility declines and increasing longevity, which in combination are leading to or already have resulted in declining populations, with or without any dampening impact of current immigration on the levels of decline.) By following the path of selected, policy relevant, demographic literature on migration as a substitute for fertility and mortality, a context will be given for a richer understanding of the recent discussions of replacement migration for aging populations in the developed world. That discussion was stimulated by a report of the UN Population Division in 2000 that analyzed in detail the potential role of replacement migration for selected countries and regions in the developed world. The development of this study will underscore that the policy interest in replacement migration in aging populations is recent, that other policy uses of international migration to achieve demographic goals have been considered and that the demographic techniques used for evaluating migration as a means to increase, decrease, or affect the demographic composition of a society, such as its age structure, are similar. Replacement migration is amenable to standard demographic analysis.

Migration as a Form of “Population Control”

In 1971, Nathan Keyfitz analyzed the proposal of substituting emigration for a reduction of fertility achieved by contraception to dampen rapid population growth (Keyfitz 1971). He addressed the question in three stages that showed the effects particularly of age structure on the results. Age structure’s importance

in the population dynamics is traceable to fertility of women, as will be seen.

Keyfitz first asked how much emigration in a given year would be necessary to offset a reduction in population growth by 1000 less births. The answer is invariably more than 1000 but how much more is related to childbearing ages of the emigrants and the growth rates of the population. The closer to the beginning of childbearing that emigrants are, the fewer the required number of emigrants. In his work, Keyfitz used Barbados and Mauritius as examples using 1966 data. If only very young children (say 0–4 years of age emigrated), their departure would require fewer additions over 1000 (14 more for Barbados and 28 more for Mauritius) than if women beyond 40 were the only ones to exit (301 additions for Barbados and 391 for Mauritius). The most “efficient” (i.e., requiring the fewest emigrants) age groups would be those just prior to and at the very beginning of the on-set of the fertile years (10–19 years of age). (Keyfitz 1971: 67) This is because those on the cusp of childbearing would also remove the future children they might bear and more of those emigrants would probably survive to have children than 0–4 year olds. Like the 1000 never born if lower fertility schedules had been adopted in the simulated example, emigrants would not add to future population growth by their future fertility.

Keyfitz’s analysis also revealed and demonstrated by the use of Barbados and Mauritius data, that in a slower growing society (lower fertility rates) fewer emigrants are needed at any given age than in more rapidly growing societies to have an equal offset to lowered fertility. (Keyfitz 1971: 66) Because Keyfitz used a single sex model in his analysis, as is customary for ease of calculation and simplicity, he notes but only in passing, that sex structure can also impact results. Assuming fertility mostly within marriage, a large sex imbalance due to males already departed from a society would diminish the effect of female emigration. Sex selection can have an impact on subsequent population dynamics as well as age selection (Keyfitz 1971: 71).

Keyfitz pointed out, however, that in the real world family structure would probably dictate that mothers would emigrate with their young children. Thus, if older women who were already into their child bearing years emigrated, it would take a larger number of emigrants to have the same impact as 1000 fewer births because the emigrant women would be accom-

panied by their minor children. In reality, Keyfitz's assumptions about family structure are not always operative because mothers emigrate without their children in many instances. One should make no assumptions about the effects of family structure on migration or on the fertility outcomes without empirical data.

Second, Keyfitz noted that as far as future generations beyond the emigrants themselves, sterilization would have the same effect as emigration. Although the sterilized women would not emigrate, either sterilization or emigration before or in the midst of childbearing would eliminate the population growth effects because of the elimination of the remaining fertility of the affected women. The same future impact would be true for a one time excess of mortality affecting women about to enter into childbearing years (Keyfitz 1971: 68).

Keyfitz's third stage of analysis asked what level of continued migration would be necessary to notably curtail population growth or achieve no growth due to emigration offsetting birth and death rate impacts on growth. The analysis he employed develops a method to calculate the proportion of all women who would have to leave a society before a given age in order for the net reproduction rate to equal 1 (i.e., each woman replacing herself with one daughter). For rapidly growing populations this is an extraordinarily higher proportion. For Barbados given its 1966 net reproduction rate of 1.767 girls born to women, 42 per cent of all girls would have to emigrate before age 15 to achieve no growth. For Mauritius, with a 1966 net reproduction rate of 2.394, 57 per cent of all girls would have to emigrate. (Keyfitz, 1971, 71) Another way to illustrate the high level of emigration required to offset rapid population growth, for Mauritius to have reduced its 1966 actual population increase from 3.1 per cent a year to 2 per cent a year in 1966, then 42 per cent of women would have had to emigrate year after year before reaching age 25 or 28 per cent before reaching age 20. "It is mere fantasy to envisage such an amount of emigration continued indefinitely for any large population." (Keyfitz 1971: 71)

This initial excursion into analyzing the substitution of migration for other demographic processes reveals important points for policy, which later literature underscores. Migration is nowhere near as effective as fertility as a policy lever to increase or decrease a population over time. This is because migration is effective only once, whereas fertility can contribute

multiple offspring. Second, the age and sex structures of a migrant population play an important role in affecting demographic outcomes, in addition to the size of the migrant flows. Third, the lesser efficiency of migration and the resulting high levels often needed to offset the effects of fertility levels on growth or decline mean that the required migration levels to provide a complete substitute effect are typically socially, economically and politically unrealistic. Migration as a single, "silver bullet" solution is often beyond the pale. Other options that more directly impact fertility or that operate in conjunction with politically acceptable levels of migration must be considered.

Immigration's Impact on Population Growth and Native Fertility

Concern with population growth in the 1960s and 1970s was not confined to a focus on developing countries. Paul Erlich's book, *The Population Bomb*, (Erlich 1968) and the organization Zero Population Growth (now Population Connection) both appeared in 1968. The first Earth Day was in the spring of 1970. The goal of zero population growth was a popular ideal for many constituents particularly of developed countries. In the United States, a National Commission on Population Growth and the American Future issued a report in 1972 analyzing the implications for the country of achieving a two versus three child family by the year 2000. By coincidence, the U.S. total fertility rate went below replacement in 1972. The two-child family average had been achieved. (Espenshade et al. 1982: 125)

An unexpected issue that presented itself to the Commission was strong opinions on immigration, both pro and anti. Some felt that then current immigration levels were high and a major detriment to achieving both zero population growth and an ultimate population size that was acceptable. Some maintained that continued high immigration would lead to never ending growth.

Princeton demographer and economist, Ansley Coale, wrote a research paper for the Commission on "Alternative Paths to a Stationary Population." His objective was to determine the "adjustment in fertility

that would be necessary to accommodate a continuing flow of in-migrants at a constant rate and still maintain a stationary population. I will also examine the size of the stationary population that would result if fertility were adjusted to a level that nevertheless made a stationary population possible.” (Coale 1972: 593) Coale’s approach was developed into a generalized form by Keely and Kraly (1978). They replicated Coale and applied his methodology on data with variant assumptions about immigrant levels and age structures.

Contrasted to the impact of emigration on slowing population growth analyzed in the Keyfitz article, the Coale and the Keely and Kraly papers looked at the required fertility adjustment to accommodate immigration and whether immigration led to a larger ultimate stationary population. Net immigration at levels of 400,000, the number used in Census Bureau projections at the time, could be accommodated by fertility levels similar to the below replacement levels in the U.S. The ultimate size of the population was projected to be about 8.5 per cent larger than it would be without immigration. Immigration at the levels then presumed current could be accommodated by fertility levels that were prevalent. The ultimate population size would not be ever-growing but was projected to be larger than if there were no immigration to the U.S.

The analyses of immigration’s demands on changing fertility and ultimate population size once again emphasized the importance of age structure in addition to the size on migration flows. Claims that constant immigration would result in ever-increasing population were demonstrated to be false. Immigration, even high levels, if it was at constant levels and age structures, would eventually produce a stationary population, albeit at higher levels than the ultimate population would have been without immigration. How much larger would be a function of both size and age structure of the inflows? (Keely and Kraly 1978: 276) Whether such larger population sizes would be desirable or acceptable remains a politically debatable issue but the debate is not about immigration leading inevitably to ever growing population size.

Finally, these studies made the policy point, simple though it was, that immigration’s contribution to population growth compared to fertility is not merely a function of the level of immigration. If fertility and mortality became equal, through whatever combination of changes and levels of those two factors, any

net immigration would account for 100 per cent of growth. To say the immigration is an increasing proportion of population growth without any allusion to what is happening to natural increase (births minus deaths) can be extraordinarily misleading for policy.

Immigration into Countries with Below Replacement Fertility

The achievement of below replacement fertility became more widespread during the 1980s in developed countries. By 1990, 29 countries had achieved that status, accounting for 650 million or 12.33 per cent of the Earth’s population. (Mitra 1990: 121) Policy attention began to shift to what effect immigration would have on the ultimate size and characteristics of countries with continuous below replacement fertility. One specific policy issue that arose was what effect immigration would have on the composition of “native” versus immigrant population. The interest was in the maintenance of such items as language and culture since immigration raises issues about the role of ethnicity in national identity and the social and political sway of racial, ethnic and religious identities. In other words, the mode and difficulties in achieving social integration in a country come commandingly into play in the political arena.

Espenshade, Bouvier, and Arthur (1982) addressed the question of extending stable population theory by including immigration. They formulated the problem by addressing the case of the United States. They posed the question by assuming constant fertility and mortality schedules permanently below replacement and a constant number of immigrants with a fixed age schedule. They asked whether the population would continue to grow, or level off and then decline, or would net migration counterbalance low fertility and a stationary population evolve. They answered the question both by projection methods and analytic approach using stable population theory. Their answer is that in a below replacement fertility population with fixed fertility and mortality schedules, any constant number of annual immigrants with a fixed age distribution will eventually result in a stationary population. The size and characteristics of the eventual stationary population are not influenced by the original population but only depend on the fertility, mortality and age-sex compositions

assumed about the immigrant population (Espenshade et al. 1982: 132).

Further, the ultimate stationary population is made up of smaller ultimately stationary population cohorts comprised of immigrants and then first, second, third and subsequent “generations” descended from those immigrants. The specific schedules of each generation result in a generational status that sum up to the total stationary population. Some of the “generations”, typically one might assume those nearest to the immigration experience, can have above replacement fertility. If somewhere in the “generational chain” of descendants a generation and all subsequent generations adopt below replacement fertility, then the population will become stationary. This statement should immediately alert the reader to different possible ethnic, racial and religious scenarios depending on whether and how quickly immigrants and subsequent immigrant generations adopt lower fertility. The proportions of immigrants and recent offspring of immigrants can be a higher or lower proportion of the overall population. Such compositional differences can raise policy challenges about the nature of the desired society and the means to achieve it.

With below replacement fertility, descendants from the initial population would eventually disappear. All the inhabitants would eventually be immigrants or the descendants of immigrants who entered since the initial time of the projection. This process would take time and the majority of inhabitants could be many generations away from their ancestors who entered at the initial time of the projection. The original culture and language could well be in place and quite continuous over time if social integration of immigrants were more assimilative than multicultural. Demographic impacts and sociocultural impacts of immigration on societies do not map one-to-one.

Arthur and Espenshade (1988) further considered the effects of immigrants’ ages on both the size and composition of below replacement populations. Extending their earlier work, they concluded that admitting older immigrants reduced population growth and ultimate size and added to population aging in the receiving society more than would be the case if younger immigrants were received into the society. The effect on size is due to the length of time left in immigrants’ lives and, more importantly, the reduction in contribution to future growth due to lessened fertility of older migrants. These effects take a long time to play out, however.

Arthur and Espenshade nevertheless, pointed out an important policy implication about aging of the receiving population. If below replacement fertility persists, the population will continue to age over time, with the sharpest aging effects in the nearer term. For the U.S., for example, the projections indicated that the mean age of the population would increase from 31.3 years in 1980 to 42 years in 2100, with the bulk of the rise in the first 50 years and is little affected by immigrants’ ages. Arthur and Espenshade (1988: 321) and Schmertmann (1992) demonstrated that immigration is inefficient in slowing the aging of a population with below replacement fertility. First, the population resulting from immigration will age over time. Even with constant annual influxes of young immigrants, the ultimate stationary population of immigrants will itself be aged. “Constant inflows of immigrants, even at relatively young ages, do not necessarily rejuvenate low-fertility populations. In fact, immigration may even contribute to population aging” (Schmertmann 1992: 602, 610).

Replacement Migration

The stage was set, both in terms of demographic literature and policy analyses of migration as an antidote to high or low fertility, for the policy question to be raised concerning the viability of in-migration counteracting the effects of an aging society. A journalist’s request for data about a possible role for immigration in mitigating economic, social and fiscal effects of aging populations in developing countries prompted the head of the UN Population Division to organize a report issued in March 2000 entitled “Replacement Migration: Is It a Solution to Declining and Aging Populations?” (UN Population Division 2000a).

The report provided data to demonstrate that a number of developed countries have had below replacement fertility, in some cases at quite low levels, for many years following the post World War II baby boom. In addition, people were living longer. As a result, population projections for many industrial countries sketch a picture of current populations becoming continuously older, much more so than the global average. Higher and higher proportions of the populations are projected to be in age groups of 65 and older. In some countries and for more of them in the future, the fastest grow-

ing age group is the “oldest old,” i.e., those over 85 years of age. Moreover, at low fertility levels similar to those of the recent past, the total size of the population in many of these countries will actually decline in the next 25–50 years.

Italy provides a striking example of the effects of recent population dynamics resulting from low fertility levels by historical standards and increased longevity. The UN median fertility level projection scenario for Italy projects that the 57.3 million Italians of 2000 would shrink to 40.7 million in 2050. In 2050, the 14.2 million residents over age 65 (representing about 35 per cent of the total population) would be supported by a working age population between the ages of 15 and 64 of 21.6 million. The ratio of workers to retirees that was 4.1 to 1 in 1995 would decline to 1.4 workers for every retiree in 2050 (Keely 2001).

The report contains a table with 33 countries expected to have population declines by 2050 according to the UN’s 1998 revised projections. All but three of them (Hong Kong, now a Special Administrative Region of China, Cuba and Japan) are European countries. The projected declines range from a fraction of 1 per cent (Luxembourg) to 34 per cent (Estonia). Other countries on the list that are projected to exceed Italy’s 28 per cent decline include Bulgaria (31 per cent) and Latvia (31 per cent). Eleven of the countries are projected to have population declines of 20 per cent or more over the 50 year period from 2000 to 2050 (UN 2000a: 6).

The UN report developed detailed projections for ten countries and regions: France, Germany, Italy, Japan, Republic of Korea, the Russian Federation, the United Kingdom, the United States, Europe and the European Union. The UN report projected scenarios of aging and declining populations by 2050 in all the developed countries and regions included. An aging and declining population will have important social, economic and political impacts. A number of these impacts are already front and center political issues, especially the capacity to finance old age pensions and health costs of an aging population. Many others are spoken of, even if not on the top of current policy agendas. These include productivity, capacity to be economically innovative and competitive, maintenance of standard of living and military and security issues.

The UN report provided three scenarios of the impact of migration on the structure of the labor force:

(1) what level of immigration is needed to stop population decline; (2) what level of immigration would be needed to maintain a constant labor force size; and (3) what level of immigration would be required to maintain a constant ratio of workers (15 to 64-year-olds) to retirees (65 years of age and older), referred to as the Potential Support Ratio (PSR). The first labor scenario for each area analyzes the more modest goal of having immigration at levels to keep the number of workers constant over time, even if the population aged overall and the proportion of the population in the older ages increased. It is based on a vision of a society whose labor force at least is not declining and, therefore, forcing closures of businesses for lack of workers. At least current levels of worker input into the economy would be available under this scenario.

The second labor force scenario is more ambitious in its vision. How much migration would be required in each of the ten examples to maintain the current PSR, or a constant ratio of workers to retirees, with working age people at least notionally “supporting” retirees, i.e., workers paying into pension and health plans? Because the populations are aging, this scenario would require more immigrants to maintain a constant PSR than to maintain a constant number of workers 15–64 years of age. For a constant PSR scenario, the labor force would increase in size as a function of the increases in the 65 and over age groups.

The UN report reviews past literature on the impact of immigration on both aging of a population and forestalling population decline. Some of the literature reviewed covers a number of countries’ historical experiences, especially after World War II, while other research employs simulation exercises to provide information to evaluate the effects of various level and trends in fertility and aging on populations as a whole and on the labor force ages. The conclusion from the literature review is that: “inflows of migrants will not be able to prevent population declines in the future, nor rejuvenate a national population, unless the migration streams reach comparatively high levels. ... The inadequacy of migration to serve as a counter for population aging, and in most cases for population decline, has been further consolidated by questions of formulation and adopting suitable migration policies.” (UN 2000a: 11) In plainer language, the last sentence means the levels of migration to effectively retard aging or lead to positive population growth are not politically possible.

The UN report tackles more modest challenges. How much annual net migration is needed to maintain the labor force at its highest number achieved between 1995 and 2050 and how much migration is needed to keep the ratio of workers to retirees the same as its highest level in the same period? There is variation among the 8 countries and 2 regions and different years at which the peak levels are reached. Populations are projected to decline by 2050 in all cases except the United States, France and South Korea. The United Kingdom is projected to decline in overall size from 58 to 56 million. The labor force size would decline in all areas and faster than population decline over the 1995–2050 period. These are the results of expected below replacement fertility and increased longevity. Likewise, longevity in all countries would result in a lower PSR in 2050, with all countries projected to have declining PSRs for at least 30 years by 2050. (UN 2000a: 19–23) These projected changes are even more pronounced in the absence of migration at levels recently experienced in the countries and regions studied.

For six of the areas included (France, Germany, the Russian Federation, the UK, the US and the European Union) the migrants needed to offset population decline are less than or comparable to levels experienced in the recent past. In the cases of Germany and the Russian Federation, however, the migration flows experienced in the 1990s were exceptional due to reunification and dissolution of the Soviet Union, respectively. For Italy, Japan, the Republic of Korea and Europe, only migration at levels much higher than recent experience would prevent population decline.

The numbers of migrants needed to counter declines in the working age population are higher and vary widely by area than are necessary to offset overall population decline. Whether the necessary levels are politically feasible in some of the cases is debatable. But the case to be made is that a policy in favor of migration levels needed for this goal are not cut and dried. In Germany and Italy, for example, the levels of immigration needed to maintain the working age population would mean that in 2050, well over a third of the countries' inhabitants are projected to be immigrants or descendants of immigrants since 1995.

The amounts of migration to offset aging and maintain the support ratio of workers to retirees at their highest level between 1995 and 2050 are all well

beyond any recent experience. Replacement migration as the sole lever to maintain the PSR is politically unfeasible. Interestingly, without any migration between 1995 and 2050, the PSR of 1995 could be maintained by raising the upper limit of the working age from 65 to 72 in the UK, 73 in the Russian Federation, 74 in France and the U.S., 77 in Germany, Italy and Japan and 82 in South Korea (UN 2000a: 22).

All these findings of the projection exercises should not be surprising in light of the previous literature reviewed about migration as a substitute for fertility and mortality changes. That does not make the challenges of an aging population disappear. What is to be done?

Before addressing that question, a cautionary note ought to be introduced. The UN Population Division that produced the report organized an expert group meeting in October 2000, about 7 months after it issued its report. The report itself received a great deal of press coverage and commentary. (Examples of discussion of the report include: Espenshade 2001; Bouvier 2001; Meyerson 2001; other work cited below; and many individual articles in a number of disciplines analyzing and discussing fiscal, political and labor impacts of replacement migration.) The UN meeting had two expert papers for each country and one each for the European Union and for Europe. Many of the experts' papers took aim at the methodology of the report. This is not to be unexpected because projections require assumptions and the projection period was fairly long, from 2000 to 2050. In a chapter such as this, all the detailed criticism cannot and need not be reviewed. Many thought the projections were constructed on assumptions that led to worse outcomes than might be expected. Will fertility rebound upward and if so, to what level and when? The report assumes immigration declines to zero by 2025 and remains at zero. The report assumes no adjustments to the already apparent problems of aging, e.g., the retirement age may not be 65 in 2050. As noted previously, the longer projections are extended in time, the more unstable they become. This statement is based on empirical study of projections made in the past and then reviewed after intervals of up to fifty years. Fifty years is a long time for confidence in population projections. And finally, there is an air about the report that population decline would be a bad thing. It is at least possible to consider that population decline itself would be a policy goal. Lower fertility and an aging population would not be a

thing to be countered but welcomed. The issue is tone and maintaining options so that population decline as a goal is not such a radical idea as to preclude such “thinking outside the box” (UN 2002b).

What Is to Be Done?

The heading for this section is not meant to signal a firm set of policy prescriptions for replacement migration. Rather the goal is to review the material on migration as a substitute demographic process for the effects of fertility and mortality. In light of that review, suggestions will be made about policy directions that include but are not limited to migration to address problems facing aging societies.

Different policy questions have elicited the idea of using migration as a means to counteract high or low fertility and changes in mortality, especially increases in longevity that contribute to population aging. Fertility is the most powerful of the demographic processes for the size and composition of populations because one woman can produce multiple children. We all die only once. Migration can only have a single impact. Even an out migrant who returns and then emigrates again, only has one net impact on the size of a population. But migration and fertility interact because in migrants and out migrants can have future fertility. Therefore, migration streams have an impact not only by their size but also by means of the age and sex structures because of potential future fertility impact on the society under discussion. It is not only how many but also who migrates that counts.

The “who” is also important in a political sense. The racial, ethnic, nationality and religious composition of migrant streams can make the flows more or less politically palatable. This counts for emigration, as well as immigration. One need only recall ethnic cleansing to see why emigration of certain groups can be viewed as politically desirable in some instances.

So from a technical level, how many and the age-sex structure matters. From a political standpoint, how many, the age and sex composition and the social attributes of migrant streams matter. Policy involves technical and political considerations.

Replacement migration will probably have a role in helping address the negative implications for aging societies. It will not be the sole policy lever employed.

What particular combination of levers are employed will vary by society and some will be more open to higher levels of migration and more heterogeneous sources of migrants.

Labor force impacts can be addressed by increasing labor force participation by older people and women. More women in many countries might join the labor force in proportions beyond the current low levels. Age of retirement and eligibility for pensions can be raised. Increases in productivity and changes in the structure of the economy can accommodate smaller labor forces.

Fiscal impacts of aging can be affected not only by raising the age of eligibility but increasing contributions, lowering benefits and changing living arrangements.

Populations in the more developed countries and some emerging economies will experience aging and, in some, populations will decline. Even more will experience slower growth, which can bring its own problems as well as benefits for an economy. But the degree of change can be mitigated to some extent by migration. Undesired effects of slower population growth, population decline and population aging can be addressed by other policy means.

Replacement migration is by no means the answer to aging and declining populations but it can be one policy among many. Whether it will be used, to what extent and in what manner will depend on countries’ visions about what is important for their society and culture, as well as their capacity to develop and implement effective policy to achieve those ends. High levels of unauthorized migration point up the importance of capacity to implement migration policy in industrial societies.

The political potential for adopting migration policy to address issues in aging societies seems limited. Despite the flurry of coverage and comment around the time of the UN report, replacement migration as a policy option seems to have been muted since.

Because of cultural concerns, Asian countries have had little interest in promoting immigration as a policy option. Traditionally, there has been deeply embedded opposition to immigration and nothing on the horizon seems to indicate change in attitude or behavior.

The greatest interest in the UN report was in Europe. (Coleman and Rowhorn 2004; Coleman 2006; Grant 2001; Francis 2002.) A number of west European countries have experienced quite large immigration flows in the post World War II period. Guest workers, many

of whom stayed and were joined by families, undocumented workers, asylum seekers, resettled refugees from outside Europe, Balkan refugees and post Soviet population displacements have all played roles in one or more countries. The issue of immigrant integration has dominated migration policy in Europe in the first decade of the 21st century. Particularly the issue of the compatibility of Islamic culture with postmodern Europe has been front and center and added emotional content to debates. Europe does not seem poised to embrace immigration as a policy tool to address economic and demographic challenges, given the social and cultural concerns swirling around the topic of immigration.

The United States, Canada and Australia as traditional immigrant receiving countries continue to have notable immigration as a conscious policy but more cautiously than in the last quarter of the 20th century. Asylum seeking and unauthorized migration have introduced more than a note of caution into those countries' policy discussion. They all have constituents who want to revisit integration issues and the capacity to integrate immigrants with quite different cultures. Debate continues and is often politically heated. However, using the U.S. as an example, the debate in 2007 about "comprehensive immigration reform" contains no serious proposal or discussion to formulate immigration policy to address the effects of an aging society. A major shift to alter immigration policy to achieve demographic goals in such unsettled policy debates is not likely.

Replacement migration will probably continue to be a topic that is readdressed from time to time as the demography of the last century and the demographic behaviors of the 21st century play out in a variety of social settings around the globe. Its salience, however, is unlikely to become very high. Other policy tools have more potential and political acceptability, though not without opposition, to address the challenges facing societies with aging populations.

References

Arthur WB, Espenshade TJ (1988) Immigration policy and immigrants' ages. *Popul Dev Rev* 14:315–326

- Bongaarts J, Bulatao RA (eds) (2000) *Beyond six billion: Forecasting the world's population*. The National Academy Press, Washington DC
- Bouvier LF (2001) Replacement migration: Is it a solution to declining and aging populations? *Popul Environ* 22: 377–381
- Coale AJ (1972) Alternative paths to a stationary population. In: Charles FW, Parke Jr RE, (eds) *U.S. commission on population growth and the american future. Demographic and social aspects of population growth*. (Vol. 1 of the Commission Research Reports). US Government Printing Office, Washington, DC, pp 591–603
- Coleman D (2006) Immigration and ethnic change in low-fertility countries: A third demographic transition. *Popul Dev Rev* 32: 401–446
- Coleman D, Rowhorn R (2004) The economic effects of immigration into the UK. *Popul Dev Rev* 30:579–624
- Ehrlich PR (1968) *The population bomb*. Ballantine Books, New York
- Espenshade TJ (2001) Replacement migration from the perspective of equilibrium stationary populations. *Popul Environ* 22:383–389
- Espenshade TJ, Bouvier LF, Arthur WB (1982) Immigration and the stable population model. *Demography* 19:125–133
- Francis DR (2002) Europeans struggle with idea of replacement migration. *Christ Sci Monit* May 23. www.csmonitor.com/2002/0523/p16502-wagi.html
- Grant L (2001) Replacement migration: The UN population division on the European population debate. *Popul Environ* 22:391–399
- Keely CB (2001) Replacement migration: The wave of the Future? *Int Migrat* 39(Special Issue 2):103–110
- Keely CB, Kraly EP (1978) Recent net alien immigration to the United States: Its impact on population growth and native fertility. *Demography* 15:267–283
- Keyfitz N (1971) Migration as a means of population control. *Popul Stud* 25:63–72
- Meyerson FAB (2001) Replacement migration: A questionable tactic for delaying the inevitable effects of fertility. *Popul Environ* 22:401–409
- Mitra S (1990) Immigration, below-replacement fertility, and long-term national population trends. *Demography* 27:121–129
- Schmertmann CP (1992) Immigrants' ages and the structure of stationary population with below-replacement fertility. *Demography* 29:595–612
- United Nations Population Division (2000a) Replacement migration: Is it a solution to declining and ageing population? United Nations, New York. (ESA/P/WP.160 21March 2000) Available at: www.un.org/esa/population/publications/RepMigED/migration.htm
- United Nations Population Division (2000b) Expert group meeting on policy responses to population ageing and population decline. United Nations, New York. Available at: www.un.org/esa/population/publications/popdecline/popdecline.htm

Part IV
Population Aging and Economic Issues

Chapter 18

Public Pension Programs – Social Security

Diane M. Watts-Roy and John B. Williamson

Introduction: History of Social Security – 1860s to 1935

During the summer of 1932, Franklin D. Roosevelt, then Governor of New York, was nominated to be the presidential candidate for the Democratic Party. In his speech to accept the nomination, Roosevelt discussed the Depression era hardships and told the American people “I pledge you, I pledge myself, to a new deal for the American people.”

Roosevelt’s New Deal was underway following his presidential inauguration in March 1933 through a variety of laws and programs including banking reform laws and agricultural, emergency and work relief programs. One of the most important programs offered through the New Deal was created by the Social Security Act of 1935. It introduced a system of social insurance that included pension programs funded by contributions from both employers and employees that came to be referred to as “Social Security.”

The term “Social Security” was first used in the U.S. by Russian-born economist Abraham Epstein and the American Association for Social Security, an organization he founded in 1927. The Social Security Act of 1935 was initially referred to as the Economic Security Act; this title was modified during the Congressional consideration of the bill (DeWitt 2003).

Early forms of public assistance or “poor laws” were modeled after the Elizabethan Poor Law of 1601 and called for local taxes to provide for the poor. Poverty relief in colonial America was kept at a local level

and town elders were expected to make the distinction between the deserving and undeserving poor. People living in early colonial settlements often provided for the elderly poor in a manner that was regarded as adequate considering the ascetic standard of living available at the time for the majority of the population. Colonists living in frontier communities were forced to depend on neighborly mutual aid for assistance (Bradford 1962).

As colonial America expanded and became more complex, almshouses and poorhouses were created in an effort to manage the problem of the needy through “indoor relief.” By the middle of the nineteenth century almshouses were located in nearly every town (Rothman 1971) and by the time Social Security became law in 1935, every state, with the exception of New Mexico, had poorhouses (Altman 2005). Non-institutionalized poverty support including cash and gifts-in-kind, sometimes referred to as “outdoor relief,” was often regarded with skepticism due to a concern that such aid would create dependency among the poor.

Social Security was not the first public pension program in the U.S. In 1862 the U.S. Congress approved legislation to establish a Civil War pension program. Pensions varied based on military rank and level of disability and initially the benefits were limited to include circumstances such as service-related injuries (Skocpol and Ikenberry 1983). Pension eligibility increased in scope with the passage of the Dependent Pension Act in 1890, which extended coverage to any veteran who became disabled for any reason, as long as the veteran had served in the Union army for at least 90 days. By 1906, age alone was considered an acceptable qualification for receiving Civil War pension benefits and pensions were also paid to widows. Though a large segment of the population benefited from Civil War pensions, big segments of society were completely excluded

D. M. Watts-Roy (✉)
Boston College, Department of Sociology
Chestnut Hill, MA 02167, USA
E-mail: diane@wattsroy.com

including most southerners, most blacks and all postwar immigrants (Orloff and Skocpol 1984).

Unions were also involved in old-age security issues. For example, in 1891 four railroad unions established old-age homes for elderly union members (Williamson and Pampel 1993) and by 1925, two railroad companies, the Pennsylvania Railroad system and the New York Central Lines, were responsible for about 40 per cent of all workers covered by private pension programs (Altman 2005).

Most of the early corporate pension programs were noncontributory and many were at the employer's discretion. The first corporate pension plan was introduced in 1875 by the American Express Company as an employer-financed old-age pension (Achenbaum 1986).

Following World War I and continuing into the 1920s, big businesses made a concerted effort to limit union expansion. Unions were supportive of the old-age pension movement, particularly the United Mine Workers, an organization that launched a political campaign to promote the benefits of old-age pensions during the 1910s (Quadagno 1988). Part of the private sector strategy to reduce union growth involved the introduction of a variety of corporate social welfare efforts. Federal tax code changes worked to provide a further incentive for the introduction of corporate pension programs and by 1930, approximately 15 per cent of the paid labor force was covered by some type of employer-based pension (Achenbaum 1986).

The Sterling-Lehlbach Act was passed in 1920, a policy measure that created a contributory pension program for about 300,000 federal civil servants as a way to provide protection from economic insecurity. This program for civil servants provided evidence that the U.S. government could potentially create and manage a widespread public pension program (Béland 2005).

The financial troubles associated with the Great Depression began to weaken the viability of corporate based pension programs and by the early 1930s, a number of companies had reduced the size of pension benefits or made eligibility criteria more stringent and some had completely stopped paying pensions (Williamson and Pampel 1993). The Great Depression soon made it clear that big business could not adequately provide for the social welfare needs of the majority of workers (Skocpol and Ikenberry 1983).

The old-age pension movement gained momentum during the early 1930s, particularly in the state of

California, due in part to the efforts of Francis Townsend and the Townsend Movement. The Townsend Plan called for a federal government pension of \$200 per month for each fully-retired U.S. citizen over age 60 with the condition that the money be spent within a thirty day period. The stated goal of this last provision was to stimulate the economy (Altmeyer 1966).

As the old-age pension movement – including the Townsend Movement and related pension movements like Louisiana governor Huey Long's "Share Our Wealth" program, the End Poverty in California (EPIC) program inspired by writer Upton Sinclair and the Ham and Eggs pension program devised by Californian Robert Noble – gained national attention with several hundred thousand supporters (Pratt 1976), the Roosevelt administration experienced increased pressure to enact some type of old-age pension program.

The development of a federal old-age insurance plan involved tensions between two dominant competing schools of thought regarding social insurance (Lubove 1968). The Ohio school, represented by leaders like Abraham Epstein and Isaac Rubinow, advocated for programs that included significant income redistribution between the classes (Williamson and Pampel 1993). In contrast, the Wisconsin school, represented by leaders like John Commons and John Andrews, sought programs that minimized cross-class income redistribution (Cates 1983).

Roosevelt formed the Committee on Economic Security (CES) in 1934 to develop and draft the Social Security Act. Roosevelt favored the Wisconsin model of social insurance and he chose committee members who represented his views (Skocpol 1995). Instead of developing a program calling for major income redistribution, the plan required that workers set aside money for old-age retirement through compulsory contributions so that the earned pensions would mirror differences in pre-retirement earnings and have at most a nominal impact on income redistribution (Cates 1983).

The Social Security Act of 1935 involved a pension plan that was mandatory, contributory and based on earnings and the pensions were not means-tested. The pension plan covered employees in industry and commerce, while excluding about 40 per cent of the work force, including farm laborers, many of the self-employed, government workers and domestic workers along with those employed by religious, educational and charitable institutions (Schneider 1937).

The compulsory social insurance plan incorporated some modest income redistribution. While workers with higher incomes earned higher pensions, individuals with lower contributions ended up with a pension that replaced a larger share of their pre-retirement income. Under the 1935 Social Security Act, monthly benefits for participants were to begin in 1942; the plan was to use the period between 1937 and 1942 for the trust fund to accumulate some assets and to provide a minimum period of participation in order to establish eligibility for monthly pension benefits.

Despite widespread popularity, the pension plan had its critics. Some organizations representing the private sector, like the National Association of Manufacturers and the Liberty League, opposed the concept of permanent social insurance programs. Their concern was that such programs would limit individual freedom (Béland 2005). Similarly, leftist social reformers including social activist Abraham Epstein, asserted that the Social Security Act of 1935 did not go far enough in its attempt to promote broader economic equality and protection against economic insecurity.

Implementation of Social Security – The Early Years

In 1937, the U.S. Supreme Court declared the Social Security Act constitutional and U.S. workers began acquiring credits toward Social Security benefits. Amendments were made to the original Social Security Act in 1939 that expanded coverage, increased benefit amounts and accelerated the start of monthly benefit payments from 1942 to 1940. Mass poverty from the Great Depression and high rates of unemployment helped set the stage for program growth. One of the biggest changes to Social Security involved a shift from a fully-funded defined benefit scheme to a modified pay-as-you-go defined benefit (PAYGO DB) scheme (Orloff 1993). With a defined benefit scheme pension benefits are based on a formula that typically factors in years of contribution (currently the 35 years with highest earnings) and average wages during those years. Social Security has never been strictly a PAYGO DB scheme as it has always included a trust fund with enough pre-funding to cover at least a year or so of benefits in order

to assure that pensions will be paid in the event of a severe recession that dramatically reduces inflow of payroll tax revenues.

In a PAYGO system, benefits are funded by utilizing current taxes. Congress created a trust fund for Social Security's assets; both income and payouts flowed through this fund. This change created a system in which every generation of retirees becomes dependent on the younger generation of workers to provide the necessary payroll tax contributions to support the program (Clark et al. 2004). The Social Security program is a form of social insurance based on the principles of shared risk within a generation and shared obligation across generations to protect all (more precisely most) members of society from the risk of economic insecurity and poverty in old age. Over the decades the program has been extended to provide similar protection against the risks of disability, sickness and injury (Baker and Weisbrot 1999).

While the original Social Security Act provided retirement benefits to individual workers, the 1939 Amendments extended coverage to include family members by adding two new beneficiary categories, "dependents benefits" or payments to the spouse or minor children of a retired worker and "survivor benefits" or payments to the family resulting from the premature death of a worker who was contributing to the program.

Social Security During the 1940s – Resistance to Expansion

There were no major changes in the Social Security program during the 1940s. Based on the 1935 legislation, payroll tax increases for the Social Security program were scheduled to be implemented in 1943. Even with pressure from President Roosevelt and others, Congress delayed the payroll tax increase scheduled for 1943.

Following Roosevelt's vision of an expanded Social Security program, President Harry Truman called for efforts to strengthen Social Security funding and to include a national health insurance program. Congress rejected both his national health insurance proposal and the proposed payroll tax increase. In 1947, Congress voted to freeze the Social Security payroll tax until 1950 with increases scheduled for 1950 and 1952 (Altman 2005).

More notable changes occurred within the realm of private pension plans. Private pension plans covered about 4.1 million workers in 1940; this number more than doubled to 9.8 million by 1950 (Graebner 1980). The expansion of private pensions is attributable, in part, to wartime events. The National War Labor Board had put limits on wage increases but not on fringe benefits. Pensions were often offered as a substitute for salary increases (Quadagno 1988).

Private retirement pensions also became part of collective bargaining efforts for some labor movement organizations including the UAW, AFL and CIO (Quadagno 1988). These efforts were supported by the Supreme Court decision on the *Inland Steel Case* of 1949, which ruled that pension benefits constitute wages and are subject to collective bargaining (Thompson 2005).

The lack of congressional support for increases in Social Security benefits led to intense pressure in the private sector to provide employee retirement benefits. The importance of upholding the solvency of the Social Security program became increasingly clear to the private sector. Private firms often considered Social Security benefits when devising their own pension programs and it became evident that the Social Security program provided a foundation or what amounted to a safety net that became an important part of maintaining and reducing the cost of private pension programs (Graebner 1980).

In 1947 the U.S. Senate passed Senate Resolution 141, which required that the Finance Committee investigate all facets of the Social Security program. The Senate Finance Committee appointed 17 people, including individuals representing business and labor, to work on an advisory council to complete this task (Advisory Council on Social Security 1948). The advisory council highlighted three problems with the existing Social Security program: inadequate coverage, overly restrictive eligibility requirements and inadequate benefits. The council made 22 recommendations for improvement, many of which were included in the 1950 amendments to Social Security.

Sometimes referred to as the “third start” to Social Security, the 1950 amendments were instrumental in making the program more inclusive by extending coverage to 10 million more Americans (DeWitt 2003). The 1950 amendments also increased benefits for both existing and future beneficiaries. In 1950 Social Security recipients received the first “cost-of-living”

increase since the program’s inception; benefits were raised by 77 per cent (Munnell 2000).

Social Security Expands – 1950s Through 1972

Between 1950 and 1970, the Social Security Act was amended regularly with changes that broadened the program’s scope. The program was particularly amenable to such changes because a large number of workers were paying into the program while a much smaller number were collecting benefits (Clark et al. 2004).

The Social Security Act of 1952 increased benefits by extending the period of wage credits given to individuals for military service. Similarly, the 1954 Social Security Act extended old-age and survivors insurance coverage to many who were previously excluded including farmers, domestic employees and self-employed members of certain professions.

The topic of disability insurance coverage, which dated back to Roosevelt’s 1934 Committee on Economic Security that had recommended protection for those who lost wages due to disability, again became an issue for debate. Though the Finance Committee removed disability benefits from the 1956 Social Security bill, in an extremely close vote, the Senate voted to restore them and President Eisenhower signed the Social Security bill into law, which included disability benefits.

Amidst controversy, the 1956 amendments to the Social Security Act worked to expand the program by providing income for disabled workers between age 50 and 64 and disabled adult children. In 1960 President Eisenhower signed a law that amended the Social Security Act disability rules in order to provide benefits to disabled workers and their dependents, regardless of age.

By the early 1960s, the Social Security program had become very popular among both Democrats and Republicans. Social Security program expansion continued during Lyndon Johnson’s presidency, including a 23 per cent average increase in cash benefits and the addition of a number of new beneficiary categories, including disabled widows and widowers at age 50 and students between 18 and 22 years old (SSA 2003). President Johnson also signed the Medicare and Medicaid Bill into law in 1965. Almost 20 million beneficiaries enrolled in Medicare during the program’s first three years (DeWitt 2003).

Johnson's Great Society aimed to eliminate poverty and to promote civil rights. In contrast to the New Deal, the Great Society emerged during a period of economic prosperity and optimism. Values like equality, freedom and opportunity were emphasized and a broad range of government programs were developed to fight the "War on Poverty" and eliminate discrimination. The basic principle of social insurance, instead of means-tested public aid, was widely embraced (Hudson 1997).

A similar favorable momentum towards Social Security continued into Richard Nixon's presidency. With the 1972 Social Security amendments, inflation protection of pension benefits was introduced. The legislation called for annual automatic Cost of Living Allowances (COLAs) based on the increase in consumer prices. The Supplemental Security Income (SSI) program, designed to provide guaranteed income to the elderly poor, was also introduced in this same year. It replaced the Old Age Assistance program, a very similar welfare program that had been created in connection with the original Social Security Act of 1935.

Following WWII through about 1970, Keynesian economic theory predominated, inspired by the work of Depression era economist John Maynard Keynes (1936) in his seminal book *The General Theory of Employment, Interest and Money*. Keynesian economics provided an alternative to laissez-faire economics and the belief that the economic markets and the private sector could successfully operate independent of the state. According to Keynes (1936) government spending and intervention, which included programs like Social Security, had a major role in creating a strong economy.

This period of social democracy and Great Society liberalism was also marked by low, stable unemployment rates and modest rates of inflation. However, a variety of changes that started taking place in the 1970s worked to spark increasing criticism of Keynesian economic theory and more generally of the competence of government and government administered social programs.

The 1970s – A Turning Tide for Social Security

Changes in American society, put in motion by the first oil embargo in 1973, the Vietnam War and the Watergate investigation, led to growing economic turmoil and social unrest. By the mid 1970s, inflation had

become a serious problem and the rate of economic growth was declining. In 1975, the unemployment rate reached 8.5 per cent, the highest rate since before the U.S. entry into WWII (Altman 2005). The deteriorating economic conditions included the onset of stagflation, a combination of high and rising rates of inflation and high and rising rates of unemployment.

Social Security was not exempt from this turmoil and in 1975, for the first time since the program's inception, benefit expenditures exceeded revenue from employment tax. The 1975 Social Security Trustees Report projected that the Social Security Trust Fund would be exhausted by 1979. It had also become clear that the COLA formula developed during the 1972 Amendments to Social Security was producing larger than intended benefit increases.

In response to this situation, President Gerald Ford recommended remedial measures that involved a formula change and a 0.3 per cent increase in both the employer and employee Social Security payroll tax contributions (Ford 1976). Congress would not enact the recommendations at that time; it was an election year and it was not possible to get the necessary Congressional support (Altman 2005).

The Social Security program confronted its first major short-term funding problem in 1977; it was largely due to high inflation, high unemployment rates and lower than anticipated wage increases (Berkowitz 1997). Other contributing factors included the sharp increase in the size of Social Security pension benefits as a result of the 1972 amendments and the increase in the number of workers receiving benefits for disability (Kingson 1984). In 1977, President Jimmy Carter's administration proposed the same correction in the COLA benefit formula that had been proposed by President Gerald Ford. Congress passed the proposal as part of the Social Security Amendments of 1977.

The 1977 Social Security legislation made program changes that involved a modest reduction in benefits and an increase in the payroll tax rate, including a substantial increase in the Medicare tax rate and an increase in the upper limit on the amount of income subject to the OASDI (Old-Age, Survivors and Disability Insurance) portion of the payroll tax (Meyer 1987).

The late 1970s were marked by widespread pessimism about the economic future of America and this contributed to a decline in support for government programs. Social, economic, political and demographic

events set the stage for a major debate over how best to reform the Social Security program. To help defend Social Security in 1979, Wilbur Cohen started an organization called Save Our Security (SOS); its goal was to create a coalition of advocacy groups interested in maintaining the program's integrity (Berkowitz 2003).

By 1980, it was evident that the 1977 legislation had not fixed the Social Security program's funding problems (Berkowitz 1997). One reason the funding problem emerged again so soon was that the economy fared much worse than most analysts had expected. Inflation hit 13.5 per cent in 1980, while wages declined 4.9 per cent and unemployment reached almost 8 per cent (Altman 2005). In 1980 the COLA increase was 14.3 per cent, while wages increased by just 9 per cent due to the poor economy (Kingson 1984). As a result retired workers on Social Security were generally better able to maintain their standard of living than were those still employed in the labor force.

Social Security During the 1980s – Program Critics Gain Momentum

With an unstable economic environment and a loss of faith in the efficacy of public institutions, government programs, including Social Security, were particularly vulnerable to criticism. Efforts were made by many conservative commentators, politicians and think tank pundits to undermine public confidence in the efficacy of many social programs linked to the New Deal and the Great Society. This helped to create a political milieu that was increasingly critical of many forms of public assistance (Skocpol 1995).

One of the primary policy objectives outlined in President Ronald Reagan's 1981 Program for U.S. Economic Recovery involved reducing the growth of government spending through the substitution of individualistic, market-driven alternatives (Niskanen 1988). Reagan's *laissez faire* economics and his conservative political agenda focused on cutting income maintenance programs and between 1981 and 1983 at least 400,000 working women lost Aid to Families with Dependent Children (AFDC) benefits (Herrick and Midgley 2002).

Although there had always been some tension between those who wanted to expand Social Security

and those who wanted to shrink the program, during this period the call from program critics for benefit cuts became very strong. Supporters of the Social Security program referred to the Social Security financing issues as "short-term" funding problems, while critics of the program, including those linked to conservative think tanks such as the Cato Institute and the American Enterprise Institute, as well as foundations such as the Heritage Foundation and the Olin Fund, depicted Social Security as headed for bankruptcy and the financing problems as a "crisis" of so-called "entitlement programs." In order to grapple with the financing challenges facing the Social Security program, the Reagan administration formed a bipartisan group, the Greenspan Commission, to tackle the issue. In 1983 Congress enacted the reforms proposed by the Commission.

The 1983 changes were more substantial than those made in 1977 and they included: (1) up to one-half of Social Security benefits would be subject to the federal income tax (before this there had not been any tax on Social Security benefits); (2) coverage was extended to all new federal employees; (3) the cost-of-living adjustment was delayed by six months and COLAs were to be based on either the increase in prices or wage increases, whichever one was lowest during the years when the trust fund falls below a specified amount; (4) the payroll tax was increased slightly; and (5) the so-called "normal retirement age" (age of eligibility for full Social Security benefits) would gradually increase from 65 to 67 years of age between 2003 and 2027 (Berkowitz 1997). While these changes would not fix all of the Social Security financing problems indefinitely, Congress could be reasonably confident that Social Security would bring in more contributions than it paid out as benefits over the next several decades.

The 1983 changes to the Social Security program signified the first time that Social Security benefits were reduced for a substantial number of program participants (Williamson and Pampel 1993). Similar benefit reduction efforts during this same period of time in Germany, France, Italy and Canada were met with much greater public protest in large measure because of the strength of labor unions in these countries (Béland 2005). The labor unions had lost ground as credible authorities on old-age pensions in the U.S. during this period and this further helped to create a milieu ripe for criticism of public programs like Social Security.

Despite the added stability, the 1983 amendments provided to the Social Security program, critics remained outspoken. In 1984, David Durenberger, a Republican senator from Minnesota, founded Americans for Generational Equity (AGE), an organization funded mostly by corporations and conservative foundations. The organizational focus of AGE involved efforts to promote the concept of “generational equity,” or the need to cut spending on the elderly in order to be fairer to the needs of other competing age groups.

The “generational equity” message touted by AGE was quite effective throughout the 1980s and early 1990s (Quadagno 1989). This included the work of Phillip Longman (1985, 1987), serving as research director of AGE, who wrote a widely read book titled *Born to Pay*. A variety of articles promoting generational equity, largely in the popular press, drew attention to this issue including work by Newsweek columnist Robert Samuelson (1988) that concluded that “The Elderly Aren’t Needy” and a Forbes article titled “Consuming Our Children” (Chakravarty and Weisman 1988). Economist Larry Kotlikoff (1992) called for “generational accounting” as a way to identify cross-generational inequities in social welfare spending.

With its emphasis on entitlement spending and the size of the federal deficit and national debt, the term “generational equity” was often used by critics of Social Security. This was part of a larger effort to radically transform the old-age program by means-testing old-age benefits for some and introducing partial privatization of the Social Security program (Howe and Longman 1992).

Advocates for the partial privatization of Social Security attacked the PAYGO DB structure of the program by suggesting that partial privatization would help protect future generations by preventing the U.S. government from spending Social Security contributions on current government consumption (Stephenson et al. 1995). Partial privatization was also promoted as a way to increase individual equity so that Social Security benefits would more closely mirror differences between workers in the amount contributed over the years (Stephenson et al. 1995).

The argument was (and still is) made that African Americans and Hispanic Americans would benefit from privatization. Researchers at the Heritage Foundation assert that Social Security is less beneficial to African Americans and Hispanics (Beach and Grossman 2005).

Due to lower life expectancies, so it is argued, African Americans on average end up with lower lifetime Social Security pension benefits than their white counterparts (Beach and Davis 1998). Privatization of Social Security is depicted as particularly beneficial to Hispanics since they will experience a heavier burden from the Social Security program in the near future due to the disproportionately high number of younger adults in the Hispanic population (Beach and Grossman 2005). The importance of an “ownership society” has also been emphasized as President George W. Bush has argued that “the more ownership there is in America... the more people have a vital stake in the future of this country” (Bush 2004). For Social Security, this translates into an argument for personal retirement accounts that workers “own and control.” It is argued that inheritance rights in personal accounts would be particularly beneficial to widows.

Defenders of Social Security, while less successful than conservative critics in getting headlines in the popular press, responded to proponents of “generational equity” and the “entitlement crisis” framing of Social Security by emphasizing that Social Security has manageable cash flow problems that can be remedied without fundamental structural changes.

For example, in *Ties That Bind*, (Kingston et al. 1986) called for a “multigenerational” social policy agenda that emphasizes the “common stake” between generations and “interdependence” between the young and old. William Hutton (1989), executive director of the National Council of Senior Citizens (NCSC), asserted the importance of intergenerational solidarity as he asked Americans to respect the “compact of mutual responsibility between generations.” The Social Security program, it is argued, helps the young and the old; nine out of ten workers between 21 and 64 years of age are eligible for benefits if they become disabled and approximately 97 per cent of children in America under 18 years of age are eligible to receive benefits if an employed parent is deceased (SSA 2004b). Widows and widowers are eligible to receive full Social Security benefits at full retirement age or reduced benefits at the age of 60; disabled widows or widowers and those taking care of a disabled child or a child 15 years or younger may receive Social Security benefits. As of June 30, 2006, approximately 6.6 million survivors of deceased workers (and this includes children, widows and widowers and dependent aged parents) were receiving Social Security benefits (SSA 2006d).

Critics of plans to partially privatize Social Security suggest that, even if differentials in life expectancy exist between African Americans and Caucasians, survivor and disability benefits significantly help to compensate for the reduced Social Security benefits they may receive (Baker and Weisbrot 1999). The idea that the Hispanic community would benefit from Social Security privatization is questioned because this population benefits disproportionately from the redistributive nature of old-age pensions and from the other types of insurance OASDI provides (Torres-Gil et al. 2005).

Critics of the “generational equity” argument often reject the suggestion to means-test benefits because of the risk of making Social Security into a welfare program in the eyes of many, which in turn could undermine support for it (Ball and Aaron 1993). There is also a concern that through time a means-tested Social Security program would exclude middle-income retired workers who still need the benefits.

While recognizing that discretionary domestic spending had been on the decline since the early 1980s, critics of the “entitlement crisis” framing in the debate over Social Security attribute this decline to a combination of tax cuts, an increase in the military budget and spending caps placed on programs funded through the discretionary domestic budget (Quadagno 1996). Defenders of the Social Security program suggest that the alleged “entitlement crisis” is part of a much broader effort to cut government social spending.

Despite the fact that Social Security remained largely in tact throughout the 1980s, a powerful anti-welfare backlash worked hard to discredit all government social programs including Social Security (Herrick and Midgley 2002) through the use of the “generational equity” and “entitlement crisis” frames.

The use of such frames helps to organize ideas by rendering certain facts as important and others as irrelevant or nonexistent (Gamson and Ryan 2005). Frames work to link core ideas by providing a combination of images, symbols and arguments that determine which values are important. The “generational equity” frame and the “entitlement crisis” frame effectively tap into major global, economic, political and social hot buttons that include economic competition in the manufacturing sector, global pressure towards efficiency, a widespread desire to cut taxes, an awareness of limited resources and a general distrust of government and the ways that it spends the tax money it receives.

Social Welfare Policy and Social Security During the 1990s

A number of economic factors and public policy changes worked together to further promote the idea of partial privatization of Social Security as part of the national policy agenda during the 1990s. The decade was largely recognized as a period of strong economic growth, robust consumption, low inflation and extraordinary stock market performance. The unprecedented rise in the U.S. stock market during the 1990s along with the continued popularity of 401(k) plans and Individual Retirement Accounts (IRAs) helped to assuage financial concerns about privatizing Social Security and to convince many workers that the introduction of funded individual accounts would be a better way to “invest” their payroll tax dollars.

From a policy perspective, the Clinton administration focused on reforming AFDC and this culminated in a program overhaul in 1996 through the Work Opportunity Reconciliation Act, which created a new program referred to as Temporary Assistance to Needy Families (TANF). This legislation ended the AFDC entitlement provision and granted significant administrative responsibility for the programs to individual states through block grants (Herrick and Midgley 2002). This shift in public policy towards the poor helped to further bolster “entitlement crisis” critiques. On an international level, the World Bank (1994) published *Averting the Old Age Crisis* in 1994, which endorsed multi-pillar pension schemes, particularly those that included funded individual accounts.

Despite what many liberals regarded as a negative turn in social policy towards the poor, President Clinton expressed a commitment to maintain the redistributive nature of the Social Security program and he aimed to allocate budget surpluses to the Social Security Trust Fund to increase the program’s future solvency (Clinton 1998).

During the Clinton presidency, the 1994–1996 Advisory Council on Social Security (1997), made up of a bipartisan group of 13 experts, provided recommendations that offered three approaches to restoring the long term solvency of the program: the Maintain Benefits Equity Investment (MBEI), the Personal Security Accounts (PSA) and the Individual Accounts (IA) plans. Two of the plans (the PSA and the IA) called for partial privatization via the introduction of funded

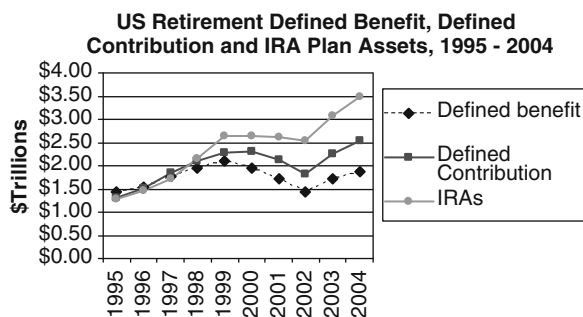
individual accounts. The MBEI plan did not call for the introduction of funded individual accounts but it did leave open the option of an independent quasi-government agency investing a portion of the Social Security trust fund in a passively managed index of the American equity market. Through the MBEI plan, the Social Security program would remain a defined benefit program. The trust fund might be exposed to the risk of stock market declines but not individual workers (Baker and Weisbrot 1999).

While the 1994–1996 Advisory Council on Social Security (1997) plans were the subject of much debate, agreement could not be reached and none of the plans were implemented. However, debate about partial privatization became increasingly mainstream as Americans had become more accustomed to accepting the investment risk associated with their own retirement savings plans. The Revenue Act of 1978, which sanctioned the use of salary reductions as a source of retirement plan contributions, sparked a national trend towards defined contribution style savings vehicles, e.g., 401(k) and IRA plans. Between 1979 and 1982 a number of companies including Johnson and Johnson, PepsiCo and Honeywell, began developing 401(k) proposals and in 1984 approximately 17,303 retirement plans included a 401(k) feature. By 1990, this number had increased about 464 per cent to 97,614 and by 1998 there were 300,593 plans with a 401(k) feature (EBRI 2005). As we can see in Fig. 18.1, which is based on data from the Employee Benefit Research Institute (EBRI), defined contribution plans overtook defined benefit plans in 1997 and then IRA schemes took the lead with respect to total worth of plan assets in 1998. IRA plans represented \$2.15 trillion in assets in 1998, compared to the \$2.11 trillion in defined con-

tribution plans and \$1.95 trillion in defined benefit plans (EBRI 2006). By 2004, approximately 61 per cent of private sector retirement assets were in defined contribution style plans (which includes IRAs), while 39 per cent of the assets were in defined benefit style pensions (EBRI 2006).

The current Social Security program is a “defined benefit” plan since it guarantees a benefit based on a predetermined formula, while an alternative scheme (or a component added to the current scheme) based on the “defined contribution” model would not guarantee a specified level of retirement income and would instead be influenced by trends in financial markets (Chen 1998). In a defined-benefit plan, the employer or in the case of Social Security, the U.S. Government, assumes any risk associated with being able to finance promised pension benefits. In a defined contribution plan, which includes 401(k) plans and the privatized component some propose to add to Social Security, the worker assumes the risk associated with participating in financial markets.

Critics of partial privatization of Social Security warn that individual economic security will depend on market forces and while some retirees will choose winning investments, others may lose a substantial fraction of the assets in those individual accounts (Kingson and Quadagno 1995) and the most vulnerable economic groups may be at greatest risk (Ball and Bethell 1997). For example, older women are likely to have less in terms of earnings, wealth and work related pensions and for this reason tend to be particularly dependent on Social Security and other social insurance benefits (Smeeding and Sandstrom 2004). Even some economists who do not seem to oppose the privatization of Social Security agree that there is a risk that privatization could lead to an increase in old-age poverty rates (Quinn and Mitchell 1996).



Source: Employee Benefit Research Institute (2006).

Fig. 18.1 US retirement defined benefit, defined contribution and IRA Plan Assets, 1995–2004

The Twenty-First Century: Debate Over Privatization Continues

The debate over the privatization of Social Security intensified after 2000. In 2001, the President’s Commission to Strengthen Social Security (2001) was formed. This “bipartisan” 16 member task force was asked to make recommendations for Social Security

reform based on six guiding principles, which included the idea that Social Security payroll taxes must not be increased and that individually controlled, voluntary personal retirement accounts would be introduced.

The Commission developed three models for Social Security reform released in reports issued in 2001 and 2002, all of which involve partial privatization of Social Security through the inclusion of personal accounts. Though President George W. Bush expressed support for a plan that included mandatory personal accounts funded with about 3 per cent of a worker's pay, consensus could not be reached even among his handpicked commission members.

In order to push for the partial privatization of Social Security, privatization advocates continue to use both the "entitlement crisis" frame and the "generational equity" frame to bolster the idea that the existing program is in need of radical reform. However, we also see extensive use of the "liberty," "freedom" and "ownership society" frames. Part of this "entitlement crisis" frame can involve combining the financing issues of Social Security and Medicare, even though Social Security and Medicare are two separate programs funded by separate taxes. Compared to the Social Security program, Medicare's financing problems are much more urgent due to the phenomenal increase in the cost of health care. President Bush's "generational equity" frame emphasizes the idea that the young will get shortchanged; that is, they may spend many years paying into a program that may not be able to pay them benefits at the level specified in current Social Security legislation (Bush 2005).

Staunch advocates for privatization of Social Security, like the Cato Institute's Michael Tanner, frame the debate about Social Security privatization as a debate over individual liberty, suggesting that Social Security as currently structured goes against the "American way" and that individuals are better able to invest their money than the government. In contrast, defenders of Social Security like Paul Krugman, an economist and columnist for *The New York Times*, suggest that the 70-year-old program is the "American Way" and that references to there being a crisis in the Social Security program are used to obscure the fact that the debate about the program's future is philosophical (Krugman et al. 2005). Such supporters recommend a variety of strategies to maintain the integrity of the existing Social Security program and raise questions about who really would benefit from partial privatization.

They often point to the added billions of dollars Wall Street would likely earn with the introduction of partial privatization.

Supporters of Social Security often use the "generational interdependence" frame in order to highlight the shared goals that exist between and across generations. Nonpartisan coalitions, including Students for a Secure Future, emphasize the assistance the current Social Security program provides to children, stating that four million children benefit from the program with one million of them being raised above the poverty line (Students for a Secure Future 2005).

Despite the critiques of Social Security, including those based on the "generational equity" frame and the "entitlement crisis" frame, on the whole, it appears that a majority of Americans believe that society has a responsibility towards the aged. Based on a CBS News/New York Times Poll administered in June 2005, when asked, "On the whole, do you think it should or should not be the government's responsibility to provide a decent standard of living for the elderly?" approximately four out of five respondents stated that it should be the government's responsibility.¹

Intergenerational commitment is reflected in data from the combined 2000–2002 NORC General Social Surveys of American adults (N=5,297) indicating that the proportion of Americans who believe that the government is spending too little on Social Security decreases with age, from 66 per cent of respondents in their thirties to 45 per cent of those respondents aged eighty and older.² That is, younger adults are more likely to believe that we are spending "too little on Social Security" than older adults.

Public support for the partial privatization of Social Security varies depending on the wording of the survey questions (Cook and Jacobs 2001). While many Americans are open to the idea of individual accounts when they are presented as an optional choice with the possibility of higher income, there is greater ambivalence when possible outcomes of privatization (including market risks and potential benefit reductions) are discussed (Cook et al. 2002). Research by the Pew

¹ The data are from a national poll administered by CBS/New York Times, June 10–15 (N=1,111) adults. Retrieved February 21, 2006, from the Polling Report Web site: <http://www.pollingreport.com/social.htm>.

² The data is from the National Opinion Research Center (NORC) General Social Survey (GSS). Retrieved August 21, 2006, from <http://www.trinity.edu/~mkearl/ger-pol.html>.

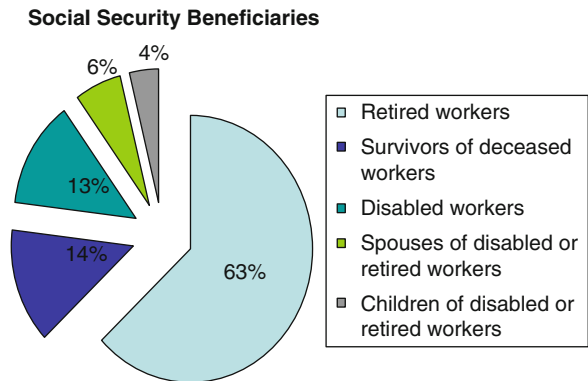
Research Center (2005) suggests that support for partial privatization of Social Security is higher among respondents who are less familiar with the issue while opposition is higher among those who report knowing a lot about this issue.

Notable shifts in public opinion attitudes about the proposed partial privatization of Social Security have occurred since the dramatic drop in the American stock markets that took place between 2000 and 2002. For example, in February 2005, a Gallup poll revealed that just over one out of three respondents approved of President Bush's approach towards Social Security. This was down from a 49 per cent approval rating in March 2001, just after Bush had taken office.³ It is likely that many of those who had been supporters of partial privatization have since come to believe that major corrections in the stock market might be a problem with the proposed funded individual accounts. As of August 1, 2006 the major equity indexes have greatly improved relative to their 2002 lows but they have still not returned to their early 2000 highs after more than six years. This shift from the stock market trend during the late 1990s has made it difficult for President Bush to generate support for his proposal to reform Social Security by introducing funded individual accounts.

The Scope of the U.S. Social Security Program

At the end of 2005, approximately 48.4 million Americans were receiving benefits from OASDI and it is important to note that a substantial fraction of the recipients are not retired workers (See Fig. 18.2). Only 63 per cent are retired workers. Another 14 per cent are survivors of deceased workers, 13 per cent are disabled workers, 6 per cent are spouses of disabled or retired workers and 4 per cent are children. Table 18.1 presents Social Security beneficiary trend data between 1970 and 2005.

Workers contribute 6.2 per cent of their earned income to the Social Security Old-Age Survivors and Disability Insurance Programs (OASDI) and this is matched by a 6.2 per cent contribution from employers. Individuals in the highest wage bracket do not



Source: Board of Trustees, Federal Old Age and Survivors Insurance and Disability Insurance Trust Funds (2006).

Fig. 18.2 Social security beneficiaries, 2005

pay into Social Security on the portion of their salary over the so-called “taxable maximum,” a figure that is adjusted annually and was set at \$94,200 for 2006. Approximately 159 million people paid Social Security payroll taxes in 2005 and the total income for the program during this calendar year was \$701.8 billion, while program expenditures reached \$529.9 billion. This left an annual surplus of approximately \$171.8 billion that was used to purchase U.S. Treasury bonds, increasing trust fund holdings to \$1.9 trillion (Board of Trustees 2006).

Individual Social Security benefits are based on a person's wage income during his or her 35 highest-earning years, which are wage indexed. If a person retires before working 35 years, then the calculation includes a \$0 for every year that is missing. The age at which a worker becomes eligible for “full” Social Security benefits (referred to as the “normal retirement age”) was 65 for many years but it is now increasing incrementally for those who were born after 1937. For those born in 1960 or after, the full retirement age will increase to 67 by 2027.

The Social Security program has several structural components that contribute to making it redistributive. The starting pension benefit is based on something called the Primary Insurance Amount (PIA) that is calculated using a formula based on the highest 35 years of wage indexed earnings. This produces some redistribution to women and others with substantial periods out of the paid labor force. The formula is progressive in that the starting pension benefit is structured to replace a higher proportion of pre-retirement earnings for those with low incomes

³ These data are from the Gallup poll and are available on the Web site: <http://poll.gallup.com/content/default.aspx?ci=1693>.

Table 18.1 Number of beneficiaries* receiving old-age survivors and disability insurance (OASDI) benefits, 1970–2005

Calendar year	Old age and survivors insurance				Disability insurance
	Total	Total	Retired workers and dependents	Survivors	Disabled workers and dependents
	000	000	000	000	000
1970	25,695	23,030	16,563	6,467	2,665
1975	31,860	27,509	20,099	7,410	4,351
1980	35,500	30,823	23,221	7,603	4,677
1985	37,027	33,123	25,960	7,163	3,904
1990	39,823	35,562	28,363	7,198	4,261
1995	43,386	37,534	30,146	7,388	5,852
2000	45,415	38,748	31,762	6,985	6,667
2005	48,435	40,126	33,473	6,652	8,309

Source: Board of Trustees, Federal Old Age and Survivors Insurance and Disability Insurance Trust Funds (2006).

*Numbers exclude transitionally uninsured beneficiaries. Benefits to these beneficiaries are initially paid from the Old-Age and Survivors Insurance Trust Fund and are then reimbursed from the general fund of the Treasury.

(Clark et al. 2004). The reason generally given for this is to increase the pension for those with low lifetime wages so that relatively few will need to apply for welfare, the means-tested Supplemental Security Income (SSI) benefit, to survive financially during their retirement years. While the “replacement rate” is higher for those with low incomes who have as a result contributed less over the years, the pension benefit is structured so that those who did contribute more will end up with a higher pension despite the lower replacement rate.

Another source of the redistributive effect of the Social security program is the treatment of those who are married (or were married for at least ten years). A spouse who has reached the normal retirement age is eligible to receive a benefit equal to 50 per cent of the covered worker’s benefit, even if the spouse has never personally made any Social Security payroll contributions. However, when both spouses have strong work histories in the paid labor force, each has the choice between taking a pension based on his or her own work history or taking the spouse benefit, whichever is larger. The spouse benefit is also available to any divorced woman of full retirement age who was married to a worker who is currently eligible for a Social Security pension, even if that person is not yet taking the pension. In addition there is a survivor benefit equal to the full covered worker benefit for survivors who have reached full retirement age. Again this benefit is extended to those who had been married to the

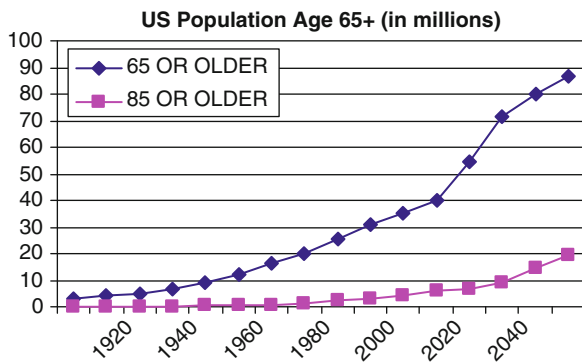
deceased former spouse, so long as the marriage lasted at least ten years.

The Anticipated Impact of the Baby Boom Generation

From the mid-1990s through the present, the debate over Social Security has largely involved conflicting ideas about how to grapple with the projected financial burden of the program in future decades due, in large measure, to the anticipated retirement of the baby boom generation. The 78 million people born between 1946 and 1964 (some of whom are immigrants who have come since the 1960s) make up the baby boom generation and represent approximately 27 per cent of the total U.S. population (U.S. Census Bureau 2006).

The first cohort of baby boomers will become eligible for early Social Security pension benefits in 2008 and full retirement benefits in 2012. The retirement of the baby boom will place new strains on the existing Social Security program as the annual surpluses, which have been accumulating in the Social Security trust fund since the 1980s, start to be drawn down about a decade after the baby boomers become eligible for Social Security retirement pensions.

During the program’s early years, Social Security was financed by a large number of contributors relative to the number of pensioners. As the Social Security



Source: U.S. Census Bureau (2005).

Fig. 18.3 US population age 65+ and age 85+, 1900–2050

program has matured, the ratio of workers to pensioners has fallen from about 16 to 1 during the early years, to 5.1 to 1 in 1960, to about 3.3 to 1 in 2006 and the figure is projected to fall still further to 2.1 to 1 by 2031 (SSA 2005). By 2031, there will be nearly twice as many older Americans as there were in 2006 – a 48 per cent increase from 37 million in 2006 to 71 million in 2031 (SSA 2006e).

The shift in the proportion of the U.S. population aged 65 and older is particularly significant when placed in historical context. In 1900, the U.S. population aged 65 and older was approximately 4.1 per cent of the total population and by 2000 that percentage had increased to 12.4 per cent. The U.S. Census Bureau projects that by 2050 this age group will increase to approximately 20.6 per cent or just over one fifth of the total U.S. population (See Fig. 18.3).

Some potential ways of dealing with the Social Security financing challenges associated with the retirement of the baby boom generation include increasing contributions from workers and employers, reducing and restructuring benefits and increasing the standard retirement age. Incentives that keep baby boomers in the paid labor force longer would also be beneficial since this would provide an opportunity to add additional money to the Social Security trust funds.

Social Security Trust Funds

The Social Security Act of 1935 established a trust fund where contributions over and above what was needed to pay pensions to current recipients would accumulate

in order to assure that adequate funds would be available to pay for pensions when current workers retired. As originally enacted it was to be a fully-funded system. However, before the first retirement pensions were made a fundamental change was instituted. The 1939 amendments to the Social Security Act transformed the scheme from a fully-funded defined benefit scheme to a PAYGO DB scheme. However it did call for a very modest level of pre-funding as the Social Security trust fund was always to include enough money in the trust funds to cover at least a year or so of benefits to deal with short-term cash flow problems.

Since 1984, in an effort to prepare for the eventual retirement of the baby boom generation, more payroll contributions have been collected than were needed to pay current pension obligations. The goal has been to increase the size of the trust funds. As a result, we currently have what would best be described as a partially-funded scheme. The surplus is deposited into one of four separate trust funds. The Old-Age and Survivors Insurance (OASI) Trust Fund pays pensions for retired workers and their widows and in some cases their minor children. The Disability Insurance (DI) Trust Fund pays disability benefits. The combined trust funds are referred to as OASDI. The Medicare program includes the Hospital Insurance (HI) Trust Fund, which covers inpatient hospital and related care and the Supplementary Medical Insurance (SMI) Trust Fund, which pays for physician and outpatient services and, as of 2006, provides a prescription drug benefit. (See Table 18.2).

When program revenues exceed benefits paid (and administrative costs), the surplus is invested in a special category of treasury bonds paying market interest rates (Baker and Weisbrot 1999). The Social Security trust funds include the accumulated value of these contributions as well as interest income from the bonds already in the trust funds. The only disbursements from the funds are for benefit payments and program administrative costs.

According to the 2006 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds, the annual costs for the Social Security program will exceed income from tax revenues until 2017. Starting at that time, the funding gap will be covered through the redemption of the treasury bonds in the trust fund. When the U.S. Treasury begins to redeem the securities, presumably starting in 2017,

Table 18.2 Estimated operations* of the combined OASI and DI trust funds in constant 2006 dollars, 2006–2035 (in billions)

Calendar year	Income excluding interest \$ billion	Interest income \$ billion	Total income \$ billion	Cost \$ billion	Assets at end of year \$ billion
2006	640.0	100.9	740.9	564.2	2,035.3
2007	656.1	106.6	762.7	577.8	2,174.8
2008	679.2	114.4	793.5	591.0	2,322.4
2009	693.8	123.5	817.2	608.1	2,468.6
2010	710.2	132.6	842.9	628.5	2,615.6
2015	780.6	174.6	955.1	755.1	3,288.3
2020	849.4	201.8	1,051.3	914.7	3,642.8
2025	917.7	198.3	1,116.0	1,087.0	3,523.1
2030	988.0	162.8	1,150.9	1,254.7	2,823.4
2035	1,065.4	96.6	1,159.9	1,397.9	1,575.0

Source: Board of Trustees, Federal Old Age and Survivors Insurance and Disability Insurance Trust Funds (2006).

* Using Intermediate-cost assumptions of the Social Security Administration.

the government will have to meet the added financial obligations by raising taxes, reducing spending and/or increasing the level of the federal debt (Reno and Lavery 2005). Money from the trust fund assets will be exhausted in about 2040 and at that point in time, the program will bring in enough revenue to fund about 74 per cent of the projected benefits⁴ assuming no changes in Social Security policy are made between now and then.

Plans for Future Solvency of Social Security

According to the 2006 Annual Report of the Social Security Administration, the Social Security program could be brought into actuarial balance over the next 75 years by increasing the combined payroll tax rate by 2.02 percentage points, reducing benefits by about 13.3 per cent, contributing about \$4.6 trillion from the general revenue, or by some combination thereof (Board of Trustees 2006). If benefits were cut by 5 per cent for every newly eligible program participant, this would eliminate 32 per cent of the projected deficit (Reno and Lavery 2005).

Other suggestions for reform include raising or eliminating the cap on the Social Security payroll tax,

using revenue from the estate tax, shifting to price-indexing (from wage-indexing) of pre-retirement wages and raising the minimum eligibility age for receipt of Social Security retirement benefits. Further incentives to keep older workers in the workforce would be beneficial; this would help increase revenue to the Social Security trust funds while decreasing the amount of benefits paid out. Reforms designated to cover a larger share of the work force would also be useful. An example of this would be to include all state and local employees in the Social Security program, an effort that would reduce the long-range projected budget deficit by approximately 10 per cent (Ball 2004).

According to the President's Commission to Strengthen Social Security, if the benefit formula were modified as proposed (resulting in cuts in promised future benefits), this change would eliminate more than 100 per cent of the long-range shortfall projections and the program would remain completely solvent over the next 75 years (OCA 2002; President's Commission 2001).

Making demographic and, particularly, economic projections, several decades into the future inevitably creates a tremendous amount of uncertainty; this helps to explain the great diversity of opinion about the projected financial status of the U.S. Social Security program in the years ahead. Factors such as future rates of female participation in the labor force, fertility, immigration, disability, mortality and real wage growth, will all have an influence on the future financial status of the Social Security program.

⁴ These figures are based on the long-range intermediate assumptions as published in the 2006 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds.

International Old-Age Pension Programs

Between the 1880s and the early twentieth century, many European countries instituted public pension programs designed to defend against old-age poverty and deprivation. In 1889, Germany, under Chancellor Otto van Bismarck, became the first country in the world to institute a national social insurance program for senior citizens. The German program was (and today still is) based on each worker's individual earnings record. Today the German system also uses "earnings credits" to reward individuals who do important societal work like child rearing and attending college. The credits are combined with individual earnings data in benefit calculations. Many other countries, including the United Kingdom (1911), Italy, Spain and Portugal (1919), the former Soviet Union (1922), Canada (1927) and France (1928), had introduced some form of social insurance based old-age pension system before the 1935 Social Security Act was passed in the U.S.

Prior to World War II, the majority of the national pension programs provided modest benefits that served more as a means to reduce poverty than to replace pre-retirement income (Béland 2005). These residual programs expected the individual and the immediate family to solve the problem of old-age security and the state was expected to intervene only when this assistance was inadequate (Graham 2002).

Many countries have based their old-age pension programs primarily on the pay-as-you-go defined benefit (PAYGO DB) model (Dixon 1999). The defined benefit in PAYGO DB schemes may be means-tested, based on employment, or universal. In some it is a flat-benefit but in most, it is wage related. Eligibility for an employment-related pension is typically contingent on many years of covered employment while universal programs generally provide a flat-rate cash benefit to all citizens who have reached the age of eligibility. Means-tested programs have need-based eligibility requirements that are typically based on individual or family income and assets.

As PAYGO DB programs have matured, the limitations of these types of programs have become more evident, including financing problems due in part to population aging, unsustainable benefit promises and shifts in employment patterns, such as the trend toward early retirement, declining fertility rates and

fiscal challenges associated with the transition to a market economy (World Bank 1994; Williamson and Williams 2003). Due to these and other challenges, changes to existing PAYGO DB schemes, as well as switching to entirely new old-age pension schemes, are under consideration in many countries.

Changes being made to existing PAYGO DB schemes include increasing the retirement age and increasing the number of contributing years necessary to become eligible for a pension. For example, the French National Assembly passed legislation in 2003 that increased the number of years that workers must contribute to the old-age pension program to 40 (from 37.5 years) in order to receive a full pension. The age qualification for Denmark's old-age pension was increased from 65 to 67 in 2004 and the early pension option will be completely phased out in Austria by 2017 through a gradual increase in the age of eligibility for the early pension.

Some countries, including Germany and Japan, use general tax revenues along with revenues from payroll taxes to finance Social Security benefits. Most countries are moving away from a single-pillar old-age security design to encompass multi-pillar programs that may include up to five pillars of support, for example: (1) a noncontributory pillar that provides a basic level of protection from poverty (often financed out of general government revenues); (2) a mandatory pillar tied to earnings that attempts to provide substantial pre-retirement income replacement; (3) a mandatory pillar that includes an individual retirement savings account; (4) a voluntary pillar that includes employer sponsored defined benefit and/or defined contribution accounts and; (5) informal intergenerational and familial sources of support, both economic and non-economic in nature (Holzmann and Hinz 2005).

One of the emerging new approaches to old-age security that has been or currently is being implemented in Latvia, Sweden, Italy, Mongolia, the Kyrgyz Republic and Poland is referred to as the Notional Defined Contribution (NDC) model (Williamson 2004). NDC programs are an offshoot of contributory social insurance programs, which attempt to more directly link program benefits to individual contributions. Each worker has a personal account and is promised a pension benefit based on contributions made to that account by the employee, the employer or both, plus the notional interest paid on the accu-

mulated notional credit in the account. Annual NDC contributions finance current pension entitlements on a PAYGO basis.

While pensions in a fully-funded account are based on market returns on account assets, pensions through a NDC scheme are calculated using both the total value of the account at retirement and the average life expectancy of a person retiring at that age. This pension is then indexed to inflation and in some cases, the rate of economic growth (SSA 2004a). Benefits are generally distributed as annuity-like pension payments. Compared to their fully-funded counterparts, payouts for NDC accounts are typically more predictable since they are not tied to fluctuations in financial markets. One caveat is that not all NDC schemes include funds for survivors' benefits or disability benefits. These contingencies are, however, often covered by separate social insurance programs.

Another model sometimes found in developing countries in Asia and Africa is the provident fund. They are publicly managed funded defined contribution schemes. This model became popular among many former British colonies when they gained independence after World War II. These compulsory savings programs often involve a combination of contributions from employee wages and employers. Contributions are invested for each participant in a publicly managed fund and at retirement, benefits are often distributed in a lump payment with accrued interest. Some provident funds also give participants the option to purchase an annuity (pension) that offers a lifelong monthly benefit. The provident fund model has become less common in recent years in part because many have had negative long-term returns (World Bank 1994; Dixon 1999; Williamson and Pampel 1993). It has been common for governments to invest these assets in government bonds paying below market rates of return that fail to keep up with inflation.

Funded defined contribution retirement savings schemes have been introduced in many countries in recent years. Initially, these defined contribution retirement savings schemes were concentrated in national provident funds and in voluntary private and occupational pension schemes (Williamson and Williams 2003). But in 1981, Chile became the first country to change from a PAYGO DB program to a mandatory privately-managed funded defined contribution (FDC) personal pension scheme.

Despite the future unknowns that exist regarding the outcome of privatized reforms on old-age pension systems, more countries have considered diversifying away from state-based social support programs in favor of partially privatized, market-oriented reforms in an effort to achieve better rates of return. The following discussion will present an overview of old-age security in Chile and the United Kingdom, the two countries that first implemented partial privatization of old-age pension programs.

Chile

Chile introduced its first public social insurance based old-age program in 1924. While the initial program covered few workers, by the 1970s the program covered about 70 per cent of the total labor force (Williamson 2005). By 1980, the Chilean social security program was in economic turmoil with the government having to finance 28 per cent of pension payments (Williamson 2005) and projections suggesting that this percentage would greatly increase in future decades. High inflation rates on assets, high rates of contribution evasion and program maturation were problems confronted by the Chilean PAYGO DB program (Myers 1992). The ratio of contributors to beneficiaries was 8–1 in 1960 but it had fallen to 2–1 by 1980 (Williamson and Pampel 1998).

In 1981, Chile replaced its public defined benefit social insurance program with a partially funded model. It is considered partially (as opposed to fully) funded due to the government's involvement in financing the system, specifically the guaranteed minimum pension, pensions for those who had already retired under the former PAYGO DB scheme (and those who had contributed to the prior scheme for many years when the conversion was made), as well as the military and the means-tested assistance pensions. As the first country to introduce mandatory individual accounts, the Chilean model has garnered widespread international interest.

One of the primary reasons for privatizing the Chilean Social Security system was to reduce government expenditures and the data suggests that a reduction in government spending has occurred. Between 1981 and 1989, pension expenditures comprised approximately 6.1 per cent of the country's GDP and this decreased

to 4.8 per cent between 1990 and 1998. Researchers project that between 1999 and 2037 pension expenditures will drop to about 4.3 per cent (Devesa-Carpio and Vidal-Melia 2002).

Despite some success in reducing government expenditures, the Chilean experience with Social Security reform has run into some problems. There has been substantial year-to-year volatility with respect to the return on assets in the pension accounts and in some years, the pension funds have lost money. Chile has struggled with the rising costs associated with the minimum pension guarantee and this has in part been caused by the decline in the number of active contributors in the paid labor force (Gil et al. 2004). In 2005, approximately 44 per cent of retirees in Chile who were covered by the new funded defined contribution scheme received pensions that were larger than the guaranteed minimum pension, while about 50 per cent received pensions that were smaller (Berstein et al. 2004).

Further, certain sectors of the population are faring better than others. For example, only about three out of ten Chilean women in the paid labor force qualify for a pension above the minimum pension amount, compared with about 40 per cent of men (CENDA 2004). The high commission rates paid to the organizations managing the pension assets have been controversial. Chilean workers retiring in 2001 had on average paid approximately 25 per cent of their lifetime contributions as fees to the private pension management companies referred to as AFPs (Williamson 2005).

The Chilean scheme has for many years been touted as a huge success by analysts who favor the partial (or full) privatization of Social Security in the United States but the reality is more complicated. In 2006 the newly elected Chilean President, Michelle Bachelet, won the election in part based on a promise of substantial reform of the pension system. As of this writing the most important change has been the increase in the size of the minimum pension. But many other reforms are under discussion, including: (1) efforts to increase the low coverage rate, currently only about 60 per cent of the labor force and particularly to increase the very low participation rate among the self-employed (currently only 10 per cent); (2) efforts to increase the amount of time workers contribute (currently workers contribute during about 52 per cent of their working lives); (3) efforts to

increase the level of the currently very low pensions for women by increasing the age of pension eligibility for women; and (4) increasing competition among the pension management organizations in an effort to drive down the still very high administrative costs (SSA 2006a; 2006b).

United Kingdom

The United Kingdom passed its first public pension legislation in 1908. It was a very modest noncontributory means tested flat-rate pension for citizens age 70 and over paid for out of general revenues. In 1925 the means test was abandoned and compulsory, flat-rate contributions split between employees and employers were instituted. It became part of the British social insurance program (Williamson and Pampel 1993; Heclo 1974). In 1961, employers in the U.K. were provided with the choice to opt out of part of the public pension program and to set up a defined benefit “occupational pension” plan.

The 1975 Social Security Pensions Act created SERPS (State Earnings-Related Pension Scheme), a second pillar to the country’s old-age pension program. SERPS was designed to provide a more substantial earnings-based pension. Based on 1986 legislation implemented in 1988, employees in the United Kingdom were given the choice to “contract out” of either the employer plans or SERPS plan and to set up “personal pensions” or defined contribution individual pension accounts referred to as APPs. Enticing economic incentives in the form of tax rebates were offered to workers to move from SERPS to APPs (Budd and Campbell 1998) and millions of employees did so.

Personal pension accounts in the U.K. attracted international attention during the 1990s due to scandals, including the 1991 Maxwell scandal and the “mis-selling” scandal in 1993. Some insurance agents convinced older workers to trade their government plan or employer-provided pensions for much less remunerative private accounts. This erupted into a scandal that ended up causing insurance companies to pay \$20 billion in damages. Overall, privatization efforts in the U.K. have not worked out as well as had been predicted and this has been particularly true for

low-wage workers and women (Williamson 2002; Ginn and Arber 1999).

Major changes have been made to the pension system in the U.K. in recent years making it ever more complex and harder for the average worker to understand. After 2002, workers were no longer able to make additional contributions to the SERPs scheme. Today all British workers must participate in a contributory public flat rate first pillar scheme called the Basic State Pension but for the second pillar they have a choice to participate in an earnings related defined benefit State Second Pension (the option selected by most low-income workers), an occupational defined benefit scheme, or the defined contribution APPs described earlier (SSA 2006c). A number of major changes are currently under consideration to help deal with the adverse consequences the move toward privatization has had for low-income workers. For example, it is likely that before long a National Pension Savings Scheme (NPSS) will be introduced that will provide a second pillar option that will offer low-cost funded individual retirement accounts financed in part by contributions from workers and in part by contributions from employers with the government using its bulk purchasing power to reduce the currently high administrative costs associated with funded schemes (SSA 2006a).

Conclusion

Old-age pension programs have been devised in a wide variety of ways across the globe. Participation can be optional or compulsory, the programs can be universal or restrictive and they can be funded by general government funds, payroll taxes, or by a combination thereof. Social Security and related old-age pensions are designed to offer the aged, disabled and their dependents a basic level of subsistence during retirement or when due to disability they are no longer able to work in the paid labor force. Opinions vary with respect to the pros and cons of funding old-age pension programs via the PAYGO DB model or through a partially (or fully) funded alternative.

The U.S. Social Security program was originally designed to provide at least some economic security for older workers, many of whom were vulnerable even when the economy was doing well and particu-

larly vulnerable during severe and long-term periods of economic contraction such as the Great Depression. Program critics from the right warned that the program could destroy America's capitalist system. Program critics from the left argued that the program did not redistribute enough wealth to provide adequate assistance to those most in need.

While the program has always had its detractors on both sides of the political spectrum, a notable shift in the debate over Social Security began in the 1970s. Economic, social, political and demographic issues that emerged during the 1970s led to funding problems, first during the late 1970s and then again in 1983. These funding problems exposed the program to aggressive critiques.

A similar set of funding problems have emerged in many other countries around the world. In some, including Chile and the U.K., the response has included less emphasis on economic security and more emphasis on individual responsibility. This trend is reflected in a growing emphasis on funded defined contribution schemes and a shift away from the PAYGO DB model. This global change can be attributed to a number of influences including the increasing cost of funding mature PAYGO DB programs due to demographic factors such as lower fertility, higher life expectancy and population aging. Also relevant has been the reduction in real wage growth and increased competitive pressures due to the economic globalization (Huber and Stephens 2000). The high levels of taxation needed to fund social welfare programs in countries such as Sweden and Germany are viewed by some analysts as having made them less competitive in international markets. Countries that are part of the European Union are under fiscal constraints because member nations must work to balance the inflationary impact of unsustainable old-age pension programs. Further, the collapse of the planned economies of Central and Eastern Europe and the challenges these countries have faced in adjusting to market economies have contributed, fairly or unfairly, to a more general discrediting of socialism and welfare states (Williamson 2002).

Macroeconomic issues involving the size of the national debt generate public concern over taxation and spending on social programs like Social Security. According to the Bureau of Public Debt at the U.S. Department of Treasury, the U.S. federal debt, as of March 2006, was \$8.27 trillion. Given this huge and ever-increasing debt, it is likely that future discourse

calling for fiscal austerity will be used by those calling for cuts in Social Security benefits (Béland 2005). However, as defenders of the Social Security program point out, the Social Security trust funds generated a surplus of \$156 billion in 2004, while the rest of the federal government ran a deficit of \$567 billion (Reno and Lavery 2005). While the size of the national debt and of the current Social Security surplus are facts, the relative success of those espousing different political ideologies in getting their competing frames for these facts accepted is likely to shape the impact these facts have on future changes in Social Security policy.

Ideology has had a significant impact on old-age pension policy, as is evidenced in the United States through the success of the “generational equity” and “entitlement crisis” framing of the debate about Social Security in the popular media, reflecting a certain “symbolic victory” and “rhetorical advantage” for critics of the program (Williamson and Watts-Roy 1999). From the political right, such terms are often used to frame the debate and to call for policy alternatives that put greater stress on individual responsibility, personal freedom and market solutions when dealing with the future of Social Security. Defenders of the program in something close to its current form have their own alternative set of phrases designed to cast the current structure of the program in a favorable light, such terms as “generational interdependence” and “generational solidarity.”

Despite the success of program critics in framing the current debate over Social Security, efforts to privatize the program have so far been unsuccessful in garnering widespread public support. At the heart of the current debate over the solvency of the Social Security program, there exists an ideological debate over the primary goals of the program. While supporters of the Social Security program emphasize the need for a program that covers all or nearly all workers and that provides at least some income distribution to low-wage workers, critics of the program tend to push for more individualized market solutions to the issue of providing economic security to older Americans.

Some changes will be needed to keep the Social Security program in the United States and in many other countries around the world, solvent in future decades. It is very likely that these changes will include a reduction in benefits, an increase in taxes, or more likely some combination of the two. Ideol-

ogy will continue to play a critical role in the present and future decisions about how to reform the Social Security program in the U.S. and in other nations around the world. A change from the existing PAYGO DB social insurance model to a partially privatized program would represent a fundamental shift in the structure of the U.S. Social Security program. While partially privatized alternatives are likely to have economic benefits for many high-wage earners and may provide a boost to the economy, partial privatization is costly and many questions remain regarding the long term consequences of such a shift. For example, while Chile has experienced some economic benefits due to partial privatization, transition costs continue to be substantial some twenty-five years after the shift to a largely privatized scheme was made. It is also becoming clear that unless some major changes are made many workers will never become eligible for even the minimum pension provided by the program (Williamson 2005).

The U.S. Social Security program has proven to be a very effective and popular social program for many decades. That said, times change and needs change. In the years ahead changes will need to be made and some of these changes may turn out to be major changes. The exact nature and magnitude of such changes cannot be specified today because we are aware of only some of the challenges the program will be facing in the years ahead. However, based on the challenges that are already emerging, such as population aging and the associated increase in the number of years retirees are spending as recipients of Social Security benefits, it is clear that something will need to be done to close the gap between revenues and benefits paid that would, if not attended to in advance, exhaust the Social Security trust fund by about 2040.

References

- Achenbaum WA (1986) *Social security: visions and revisions*. Cambridge University Press, Cambridge
- Advisory Council on Social Security (1997) *Report of the 1994–1996 advisory council on social security: vol 1: findings and recommendations*. U.S. Government Printing Office, Washington, DC
- Advisory Council on Social Security (1948) *Proposed changes in old-age and survivors insurance: report of the advisory council on social security to the senate finance committee*.

- Social Security Bulletin. 11(5). 21 August 2006 <http://www.ssa.gov/history/reports/48advise1.html>
- Altman NJ (2005) *The battle for social security*. John Wiley & Sons, Hoboken, NJ
- Altmeyer A (1966) *The formative years of social security*. University of Wisconsin Press, Madison, WI
- Baker D, Weisbrot M (1999) *Social security: The phony crisis*. University of Chicago Press, Chicago
- Ball RM (2004, December) Social security plus. 10 Apr 2006 www.ourfuture.org/docUploads/SS_Plus_Ball_12_2004.pdf
- Ball RM, Aaron HJ (1993) The myth of means-testing. *Washington Post*, (November 14):C4
- Ball RM, Bethell TN (1997) Bridging the centuries: The case for traditional social security. In: Kingson ER, Schulz JH (eds) *Social security in the twenty-first century*, Oxford University Press, New York, pp 259–294
- Beach WW, Grossman AM (2005) Hispanic workers should back personal accounts. Heritage Foundation, Web Memo #782, (June 30). 5 May 2006 <http://www.heritage.org/Research/SocialSecurity/wm782.cfm>
- Beach WW, Davis GG (1998) Social security's rate of return for Hispanic Americans. Heritage Foundation Center for Data Analysis Report, CDA98–02, (March 27). 5 May 2006 <http://www.heritage.org/library/cda/cda98-02.html>
- Béland D, Lawrence KS (2005) *Social security: History and politics from the new deal to the privatization debate*. University Press of Kansas
- Berstein S, Larrain G, Pino F (2004) Cobertura, densidad y pensiones en Chile: Proyecciones a 30 años plazo. PowerPoint presentation given at the joint conference between Centro de Estudios Públicos and the Superintendencia de AFP entitled *Desafíos del Sistema Chileno de Pensiones: Competencia y Cobertura*. Santiago, Chile: CEP-SAFP Nov
- Berkowitz ED (1997) The historical development of social security in the United States. In: Kingson ER, Schulz JH (eds) *Social security in the twenty-first century*. Oxford University Press, New York, pp 22–38
- Berkowitz ED (2003) *Robert Ball and the politics of social security*. University of Wisconsin Press, Madison, WI
- Board of Trustees, Federal Old Age and Survivors Insurance and Disability Insurance Trust Funds (1975) *The 1975 annual report of the trustees of the federal Old-Age and Survivors Insurance and Disability Insurance trust funds*. 21 August 2006 <http://www.ssa.gov/history/reports/trust/trustyears.html>
- Board of Trustees, Federal Old Age and Survivors Insurance and Disability Insurance Trust Funds. (2006) *The 2006 annual report of the trustees of the federal Old-Age and Survivors Insurance and Disability Insurance trust funds*. 16 July 2006 <http://www.ssa.gov/OACT/TR/TR06/>
- Bradford W (1962) *Of plymouth plantation*. Capricorn Books New York
- Budd A, Campbell N (1998) The roles of the public and private sectors in the UK pension system. In Feldstein M. (ed) *Privatizing social security*. University of Chicago Press, Chicago, pp 99–127
- Bush GW (2004, June) Fact sheet: America's ownership society, expanding opportunities. 1 Sept 2006 <http://www.whitehouse.gov/news/releases/2004/08/20040809-9.html>
- Bush GW (2005, May) President discusses strengthening social security for younger workers. 18 May 2006 http://www.whitehouse.gov/news/releases/2005/05/images/20050519-1_w9w2365-515h.html
- Cates JR (1983) *Insuring inequality: Administrative leadership in social security 1935–54*. University of Michigan Press, Ann Arbor
- Centro de Estudios Nacionales de Desarrollo Alternativo (CENDA) (2004) *Chile: Bases para una reforma del sistema de pensiones*. CENDA, Santiago, Chile
- Chakravarty SN, Weisman K (1988) Consuming our children. *Forbes* (November 14), pp 222–232
- Chen Y-P (1998) Economic security: Strengthening social security. In: Steckenrider JS, Parrot TM (eds) *New directions in old age policies*. State University of New York Press, Albany, pp 37–50
- Clark RL, Burkhauser RV, Moon M, Quinn JF, Smeeding TM (2004) *The economics of an aging society*. Malden, MA: Blackwell
- Clinton WJ (1998, April) Discussion on social security reform. 16 Mar 2006 <http://www.cnn.com/ALLPOLITICS/1998/04/07/social.security/transcript.html>
- Concord Coalition (1993) *The zero deficit plan*. Concord Coalition, Washington, DC
- Cook FL, Barabas J, Page BI (2002) Invoking public opinion: Policy elites and social security. *Public Opin Q* 66: 235–264
- Cook FL, Jacobs LR (2001) Americans' attitudes toward social security: Popular claims meet hard data. *Soc Sec Brief* 3(10):1–8
- Devesa-Carpio JE, Vidal-Melia C (2002) *The reformed pension system in Latin America*. World Bank Pension Reform Primers Series. World Bank, Washington, DC
- DeWitt L (2003) Historical background and development of social security. 21 August 2006 <http://www.ssa.gov/history/briefhistory3.html>
- Dixon J (1999) *Social security in global perspective*. Westport, CT: Praeger. Employee Benefits Research Institute. (2005, February). *History of 401(k) plans: An update*. 8 June 2006 <http://www.ebri.org/pdf/publications/facts/0205fact.a.pdf>
- Employee Benefits Research Institute (2006, February) *Traditional pension assets lost dominance a decade ago, IRAs and 401(k)s have long been dominant*. Fast Facts from EBRI, #16. 8 June 2006 <http://www.ebri.org/pdf/publications/facts/0205fact.a.pdf>
- Ford GR (1976, February) *Special message to the Congress on older Americans*. 6 June 2006 <http://www.ssa.gov/history/fordstmts.html#tfund>
- Gamson WA, Ryan C (2005) Thinking about elephants: Toward a dialogue with George Lakoff. *Public Eye Mag* 19(2):1, 13–16
- Gil IS, Packard T, Yermo J (2004) *Keeping the promise of old age income security in Latin America*. The World Bank, Washington, DC
- Ginn J, Arber S (1999) Changing patterns of pension inequality: The shift from state to private sources. *J Soc Policy* 19: 319–342
- Graebner W (1980) *A history of retirement*. Yale University Press, New Haven
- Graham JR (2002) *Canada*. In: Dixon J, Scheurell RP (eds) *The state of social welfare: The twentieth century in cross national review*. Praeger, Westport, CT, pp 77–107
- Hecl H (1974) *Modern social politics in Britain and Sweden*. Yale University Press, New Haven, CT

- Herrick JM, Midgley J (2002) The United States. In Dixon J Scheurell RP (eds) *The state of social welfare: The twentieth century in cross national review*, Praeger, Westport, CT, pp 187–216
- Holzmann R, Hinz R (2005) *Old-age income support in the twenty-first century: An international perspective on pension systems and reform*. World Bank, Washington, DC
- Howe N, Longman P (1992) The next new deal. *Atlantic Monthly* (April):88–99
- Huber E, Stephens JD (2000) The political economy of pension reform: Latin America in comparative perspective. United Nations Research Institute for Social Development. Geneva 2000 Occasional Paper No. 7, 1–55
- Hudson R (1997) The history and place of age-based public policy. In: Hudson R (ed), *The future of age-based public policy*, Johns Hopkins University Press, Baltimore, pp 1–24
- Hutton WR (1989) The young and the old are not enemies. *USA Today Magazine*, (March):63–65
- Keynes JM (1936) *The general theory of employment, interest and money*. Harcourt, Brace & Company, New York
- Kingson ER (1984) Financing social security: Agenda-setting and the enactment of the 1983 amendments to the Social Security Act. *Policy Stud J* 14:131–155
- Kingson ER, Hirshorn BA, Cornman JM (1986) *Ties that bind*. Washington, D.C.: Seven Locks Press
- Kingson ER, Quadagno J (1995) Social security: Marketing radical reform, *Generations* 14(3):43–49
- Kotlikoff LJ (1992) *Generational accounting*. The Free Press, New York
- Krugman P, Tanner M, Marshall JM (2005) Social security: Is it really a crisis? Proceedings of the New York Society for Ethical Culture; New York City, (March 15) 10 Mar 2006 from www.tcf.org/Events/3-15-05/krugmantannermarshall-transcript3-15-05.pdf
- Longman P (1985, June) Justice between generations. *Atlantic Monthly* 256:73–81
- Longman P (1987) *Born to pay: The new politics of aging in America*. Houghton Mifflin, Boston
- Lubove RC (1968) *The struggle for social security 1900–1935*. Harvard University Press, Cambridge
- Meyer CW (1987) Social security: Past, present, and future. In Meyer CW (ed) *Social Security*, (pp 1–34) Lexington Lexington, Mass
- Munnell AH (2000) *Social security and retirement research: From research to policy*. Boston, MA: Center for Retirement Research at Boston College. 10 May 2006 <http://www2.bc.edu/~munnell/ssandret.pdf>
- Myers RJ (1992) Chile's social security reform, after ten years. *Benefits Q* 8(3):41–55
- Niskanen W (1988) *Reaganomics*. Oxford University Press, New York
- Office of the Chief Actuary (OCA) (2002) Estimated financial effects for three models developed by the President's Commission to strengthen social security. Memo from Goss SC to Moynihan DP, Parsons RD (January 31)
- Orloff AS (1993) *The politics of pensions: A comparative analysis of Britain, Canada, and the United States, 1880–1940*. The University of Wisconsin. Wisconsin
- Orloff A, Skocpol T (1984) Why not equal protection? Explaining the politics of social spending in Britain, 1900–1911 and the United States, 1880s–1920. *American Sociological Review* 49:726–750
- Pew Research Center (2005, March) Public divided on Alaska drilling, as well as social security, pp 1–13. 22 Aug 2006 <http://www.pewtrusts.com>
- Pratt HJ (1976) *The gray lobby*. University of Chicago Press, Chicago
- President's Commission to Strengthen Social Security (2001) *Strengthening social security and creating personal wealth for all Americans: Report of the President's Commission*. 31 Mar 2004 <http://www.csss.gov>
- Quadagno J (1988) *The transformation of old age security*. University of Chicago Press, Chicago
- Quadagno J (1989) Generational equity and the politics of the welfare state. *Politics Soc* 17:353–376
- Quadagno J (1996) Social security and the myth of the entitlement 'crisis'. *Gerontologist* 36:391–399
- Quinn JF, Mitchell OS (1996) Social security on the table, *Am Prospect* (May – June):76–81
- Reno VP, Lavery J (2005, February) Options to balance social security funds over the next 75 years. *Natl Acad Soc Insur* 18:1–12
- Rothman DJ (1971) *The discovery of the asylum*. Little, Brown, Boston
- Samuelson RJ (1988) The elderly aren't needy. *Newsweek* (March 21):68
- Schneider MG (1937) *More security for old age: A report and program*. Twentieth Century Fund, New York
- Skocpol T (1995) *Social policy in the United States: Future possibilities in the United States*. Princeton University Press, Princeton, NJ
- Skocpol T, Ikenberry J (1983) The political formation of the American welfare state in historical and comparative perspective. *Compar Soc Res* 6:87–148
- Smeeding TM, Sandstrom S (2004) Poverty and income maintenance in old age: A cross national view of low income among older women. Center for Retirement Research at Boston College, Boston, MA 22 Aug 2006 http://www.bc.edu/crr/papers/wp_2004-29.pdf
- Social Security Administration (1997) Office of the Chief Actuary 15 Mar 2006 <http://www.ssa.gov/OACT/NOTES/AS112/as112.html>
- Social Security Administration (2002) *Annual statistical supplement, 2001*. US Government Printing Office, Washington, DC
- Social Security Administration (2003) *History of SSA during the Johnson Administration 1963–1968*. 21 Aug 2006 <http://www.ssa.gov/history/ssa/lbjleg1.html#3>
- Social Security Administration (2004a) *Strengthening social security: Can we learn from other nations? Testimony before congress by James B. Lockhart III, Deputy Commissioner, Social Security Administration*. 8 May 2006 http://www.ssa.gov/legislation/testimony_051804.html
- Social Security Administration (2004b) *Social security: Performance and accountability report for fiscal year 2004*. US Government Printing Office, Washington, DC
- Social Security Administration (2005, March) *The future of social security*. Publication No. 05–10055, ICN 462560. Retrieved March 15, 2006 from <http://www.ssa.gov/pubs/10055.html>
- Social Security Administration (2006a, April) *International update: Recent developments in foreign public and private pensions*. SSA Publication No. 13–11712. Washington, DC: SSA Office of Policy

Chapter 19

Private Pensions in International Perspective

Angela M. O’Rand, Donald Ebel and Katelin Isaacs

Introduction

In the mid-1990s, in response to the spreading problem of financing public pay as you go (PAYGO) pension systems across industrialized countries experiencing population aging and economic globalization, the World Bank called for a three pillar model of pension policy to avert the old age crisis (World Bank 1994). The first pillar was to consist of minimal public sector defined benefit pensions based mainly on PAYGO financing; the objectives were redistribution and poverty reduction. The second was to consist of earnings-related or occupational pensions that could have public (government subsidized) or private financing arrangements; the objective was to promote or enforce saving. The third was to consist of private individual savings, with the objective to encourage individual, voluntary saving. Diverse mixes of these three policy alternatives already existed across advanced societies but the decade following the report has been characterized by more and more policy shifts across countries with different welfare state legacies towards more private and voluntary schemes. Meanwhile, the United States pension system was already based on a three pillar structure in 1994 and has tilted towards the third pillar vigorously.

This chapter will consider private pensions in an international perspective. First, the range of welfare state legacies across countries will be briefly summarized. Second, the history of private pensions in the United States will be reviewed, with an emphasis on the recent two-decade shift from defined benefit

to defined contribution occupational pension plans and recent debates about privatizing a portion of its PAYGO plan. Finally, selected international comparisons of recent policy changes will be reviewed among countries facing severe population aging trends that are forcing them to privatize their systems and move retirement ages later. Paradoxically, perhaps, the three pillar system has both separated the public from the private occupational and individual sectors and made them more interdependent. In some countries the boundaries between the pillars are blurred.

Welfare State Legacies

The diverse mixes of changing pension policies across countries are nearly as numerous as the countries themselves. Distinctive institutional and cultural histories over two centuries have shaped alternative approaches to providing social insurance for different elements of national populations, such as citizens, workers, children, the aged and the ill. The predominance of first, second and/or third pillar schemes in pension provision has been shaped in large measure by these legacies.

Four dominant models of pension policy across “welfare states” have been described (Esping-Anderesen 1999). Arguably, as ideal types they reflect different positions on a continuum of equity–efficiency. The *liberal model* emphasizes efficiency over equity and is dominated by market institutions and private mechanisms for individual income security. Public programs serve a residual role, as safety nets underlying the market system. The U.S. and the U.K. fall within this model, though their respective systems are different in a number of ways, including the absence of

A. M. O’Rand (✉)
Duke University, Durham, NC, USA
E-mail: aorand@soc.duke.edu

a national health insurance system in the U.S. (except for the population age 65 and older). The *social rights model* is found in two major forms on the European continent: (a) the social democratic form of the Nordic states that places citizenship first as the basis of social rights and entitlements and intervenes in the market through wage and related policies and (b) the corporatist form that partitions social rights along institutional lines that preserve boundaries between market and familial institutions. The third model applies to the newly industrializing states of the Pacific Rim; the *developmental state model* integrates government and market development through the state's direct support of national industries with subsidization and tariff protection and the erection of authoritarian educational, familial and welfare systems.

Fourth, what can be referred to as the *liberal reform model* is emerging in Post-Soviet European countries and in some developing countries. Socialist states (Post-Soviet Eastern Europe) and some Asian countries have traditionally subsumed market policies under state ownership and planning but they are now undergoing rapid transformations in the new Post-Soviet global context. These transformations are primarily in the direction of a liberal reform model that adopts selected privatized and individualized insurance policies that follow the guidelines of the World Bank and other international organizations, like the International Monetary Fund, on whom these developing states depend for international credit (Bonoli 2003). Also, other parts of the developing world, particularly Latin America where welfare systems are only recent developments, are adopting liberal reforms following World Bank guidelines. In Latin America, Chile became the liberal model for the region in this regard in 1980 with the legislation of mandatory individual retirement accounts. The Chilean model has diffused throughout Latin America where ten countries implemented social security programs with mandatory private savings by 2000 (Sinha 2000; De Mesa and Mesa-Lago 2006) but mixed 2 and 3 pillar models are more common. While they vary considerably in specific regulations that pertain to benefit levels, benefit types, work-year requirements, etc., the tilt is clearly towards privatization and individualization (O'Rand 2003).

The older European models, which have been increasingly challenged by demographic and globalizing forces to be described later in this essay, are deviating more and more from the ideal types that fit their respective welfare regimes better three decades ago.

They are considering and/or adopting more liberal policies that follow the logic of the *devolution of risk* that has been evident in liberal welfare states such as the U.S. and the U.K. for a long period and more recently in developing states.

The Devolution of Risk – American Style

The liberal U.S. welfare model is founded on three pillars identified by the World Bank. The first is an earnings-related PAYGO social retirement and health insurance plan for the retired worker population and its dependents/survivors and means-tested social assistance for the indigent. The second is a private occupational pension and health insurance system that has never been available to all workers and, in recent years, has shifted towards more individualized and less collective plans. Third, personal savings through asset accumulation including tax shelter-motivated individual retirement accounts have complemented the public and occupational sectors but have emerged as favored policies since the 1980s. Pensions and health care are probably the two most important components of social welfare policies for adult populations representing the largest shares of expenditures from both public and private sources across all welfare regimes.

Both public and private pension and health maintenance policies grew in the U.S. over the post-World War II years to cover larger segments of the workforce, families of workers and the more indigent groups that fell outside the employment system until the early 1970s. The expansion was driven, in part, by sequential amendments to the Social Security Act that increased benefits to dependents and survivors, to the poor and to qualified divorced spouses; made pensions available at earlier ages (age 62 for workers, age 60 for widows); and tied benefits to the cost-of-living-index. However, by the 1980s, the growth of collective (private and public) policies for social insurance to support pensions and health maintenance halted and then reversed.

The *devolution of risk* refers to the shift in economic risk-bearing from employers and/or governments to individuals and their families (Hacker 2006). It is evident in the expansion of proposals and programs in the U.S. over the past quarter century that encourages more private and individual forms of insurance against life course risks, including health and income

loss. Health insurance is largely a non-issue in Anglo-European welfare states where national health insurance systems are in place and cover all citizens. But in the U.S., public national health insurance is still a hotly debated issue; Medicare/Medicaid programs cover the oldest and neediest members of the population but an expansion of the program to universal coverage continues to be met with considerable resistance. And, arguably, the persistent resistance to national health insurance has spilled over into recent debates to reform the Social Security system with the introduction of individualized accounts to be invested in the market and taken out of the PAYGO scheme (Hardy and Hazelrigg 2007).

The second pillar in the U.S. does not cover the entire population. Occupational pensions and employer-provided health insurance for the working population and its families have always been available to only a share of the employed population; only half of workers have ever been covered by occupational pensions in the private sector and only approximately 85 per cent of the population is covered by public or private health insurance at any one time (meaning perhaps an even smaller share closer to 70 per cent actually experiences stable coverage of health insurance over longer periods of time) (Institute of Medicine 2003). In short, the public sector programs have reached most in the population directly or indirectly, while the other two pillars have not – either because they have not been made available or because individuals with access to them have not been able to take advantage of them.

One recent trend among private employers is to withdraw from pension and health insurance offers

altogether. Table 19.1 summarizes trends in pension and health insurance coverage of U.S. employees between 1979 and 2000. Per cent changes in coverage are reported by age-groups of employees and size of employer. The downward trends in coverage are pervasive and most notably apparent in the largest firms and for the youngest workforces. These patterns are all the more poignant given that a growing literature demonstrates the relationship of health maintenance to health coverage and health disparities across the life span associated with the cumulative disadvantages stemming from lower wages and lack of benefit coverage (O’Rand 2006). An added shift in employer coverage of health insurance is away from family coverage, forcing workers to seek alternative coverage for their dependents even if they are themselves covered at work.

These trends are traceable to the restructuring of the workplace in the U.S. associated with globalization and to population aging. The majority of the workforce is located in the service (high-end and low-end) sectors and in wholesale and retail trade. The transformation of labor began in the late 1970s and early 1980s when the manufacturing sectors began to shrink as employers moved production off-shore and restructured their organizations to compete in the global economy. The preference for contingent and externalized labor forces has since spread to other industries including communications and finance. Allegiance to workers that once prevailed in these sectors has been replaced by price competition and allegiance to stockholders. The results include lower wages, reduced benefits and increased inequality (Levy 1998).

The first private pension plans in the U.S. date back to 1875 when large corporations and the railroad introduced them but most of these were bankrupted in 1930 with the market collapse. After World War II pensions emerged rapidly as what the U. S. Chambers of Commerce called “the hidden payroll,” because post-war wage controls motivated new ways to compensate favored workers and union leadership turned to more vigorous collective bargaining on behalf of pensions. Private pensions expanded rapidly until 1970 after which several structural and institutional changes began to make pensions a growing burden for employers (Hinz 2000; Munnell et al. 2002a). The trend has been towards increased voluntary and individualized pension plans displacing responsibility for pension saving strategies from employers, unions and

Table 19.1 Percentage change in employee health insurance and pension coverage between 1979 and 2000 (CPS)

	Health insurance	Occupational pension
<i>Age of Employee</i>		
All Employees	-15	-6
<30	-23	-15
30-44	12	-6
45-54	-8	-4
55-64	-8	-8
<i>Size of Firm</i>		
Firm <100	-5	5
100-499	-16	-6
500-999	-15	-6
1000+	-24	-20

Source: Current population surveys 1979-2000.

other collective bodies to individual workers and their families.

The devolution of pension risk in the U.S. is also evident in the strong tilt towards the third pillar observable in the spread of defined contribution plans and related individualized financial instruments as the prevalent forms of retirement saving in the 21st century workplace. Types of U.S. pensions fall into three categories: defined contribution, defined benefit and hybrid plans (Thompson 2006). Defined contribution (DC) plans take several forms. They may be deferred profit sharing plans and employee stock ownership plans (Smith et al. 2004), which proliferated in selected sectors over the 1990s and have been vulnerable to corporate bankruptcy. Legislation since 2003 has moved to curtail the proportion of a DC plan that is based on profit sharing or stock ownership schemes.

However, the dominant form of DC plans is the investment account (e.g. 401k) to which workers contribute a percentage of their earnings, which is usually matched at some level by employers. They are portable and tax sheltered until distributions begin to be withdrawn at eligible ages and can carry loan options following strict repayment schedules with penalties attached in the case of default – all characteristics that make them appealing to workers. Contributions are usually distributed across mutual funds of stocks and bonds at the discretion of workers. At the time of retirement, the balances of these accounts can be paid as lump sums and rolled over into other retirement instruments or distributed following variable or fixed (or mixed) annuity arrangements.

Nearly all new businesses in the U.S. since the mid-1990s have adopted DC plans only (Hinz 2000; Purcell 2002). “Healthy” established businesses are also freezing their DB plans to offer only DC plans in their place to all categories of workers (Munnell et al. 2006). Arguably, mid-career workers have a higher risk of pension loss from plan freezing because unlike the younger workers they have less time to benefit from the compounding growth of investments and unlike older workers they have not yet earned their maximum benefits from the older DB plans.

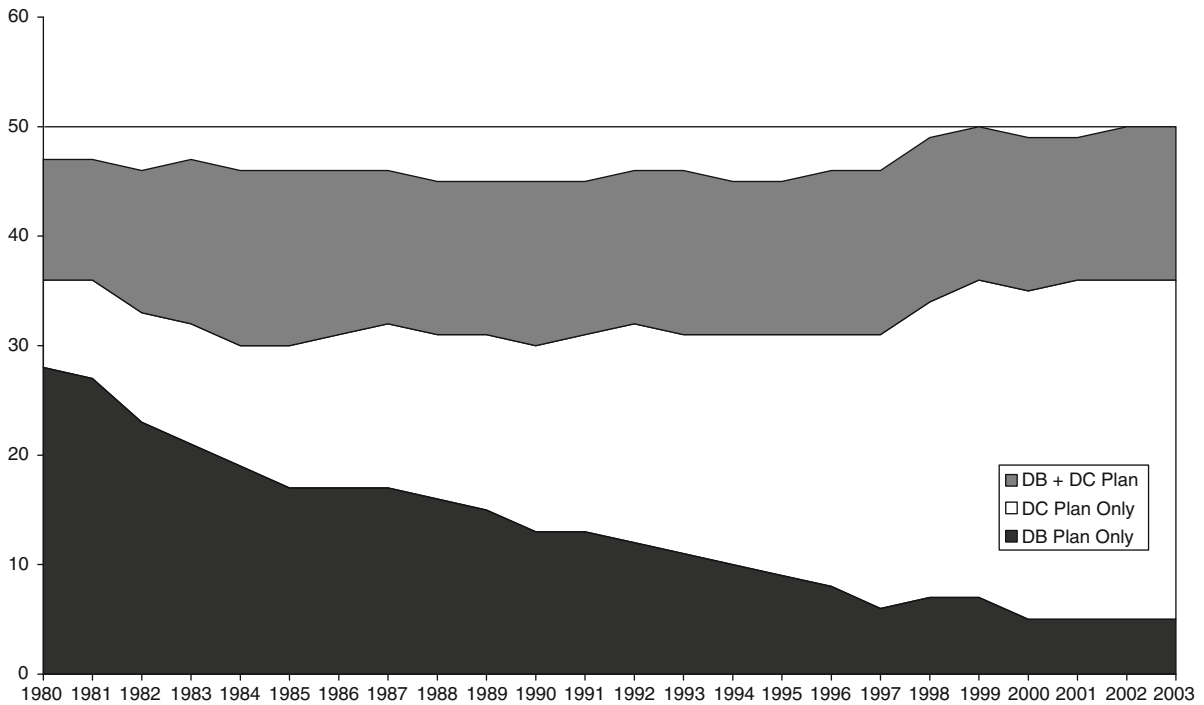
Hence, DC plans are replacing the traditional defined benefit (DB) plans, which paid out lifetime annuities based on formulae that calculated years of service and pre-retirement salary levels. As Fig. 19.1 shows, although the percentage of workers in the private sector covered by pensions has remained remark-

ably stable over the past 25 years (only half of all workers have been covered by occupational pensions), the share of covered workers with DC only plans has more than tripled. DB plans were limited to the traditionally advantaged private labor markets and to the public sector. They were principally associated with government employment and large monopoly (e.g., manufacturing, communications, transportation, finance) sectors where union-management accords during the middle of the twentieth century focused on wage and benefits agreements. These plans were not portable and accessible prior to retirement. And, they were available primarily to men, who were concentrated in these sectors and to women primarily in public sector employment if they remained with these jobs long enough to vest in their pensions. Employers were liable for maintaining and insuring these plans following legislation in the 1970s (The Employee Retirement Income and Security Act of 1973; see Wooten 2005). Workers covered by both DB and DC plans typically have DC pensions as supplementary to their DB pensions; these are clearly the most advantaged workers.

However, by the mid-1980s and early 1990s in the face of population aging and globalization processes, employers began abandoning DB plans for DC alternatives. In addition, the older DB plans have been recently challenged by problems with corporate bankruptcy and underfunding in several sectors, especially the manufacturing and transportation sectors, meaning that current retirees and some older workers in these labor markets face the serious reduction or potential loss of their occupational retirement benefits.

Today, approximately sixty per cent of households covered by a pension have only defined contribution plans, while only twenty per cent have only a defined benefit plan and twenty-five per cent have both. Eighty per cent of all pension contributions go to DC plans; and nearly three out of four participants in workplace pensions have DC plans, among the most popular being the so-called 401 k plan (Munnell and Sundén 2004). These plans have formed a “two-tier pension system” with higher paid employees benefiting from DB and DC plans and rank and file workers limited to DC plans (Munnell and Sundén 2004; Munnell et al. 2006).

Hybrid plans are offered in two forms: cash balance plans and target benefit plans. Cash balance plans are DB plans that hold accrued benefits in individual



Source: 5500 data reported in Buessing and Soto (2006).

Fig. 19.1 Distribution of pension types among private sector workers in U.S., 1980-2003

accounts that specify rates of contribution and return. Target benefit plans are DC plans that are calculated to generate returns in the same manner as DB plans (Twinney 1997; Rappaport et al. 1997). Cash balance plans have been introduced to replace traditional DB plans, especially among younger, newer workers. The Bank of America developed the first cash balance plan in 1987; a decade later other employers began to follow with approximately 12–15 per cent of all DB plans replaced with these new instruments by the early 2000s (Munnell et al. 2002a). Legislation since 2003 has imposed limitations on cash balance plans and halted their expansion (Buessing and Soto 2006).

Another private pension-saving instrument also emerged in the 1980s to provide a retirement saving strategy but outside of the workplace. Individual Retirement Accounts (IRAs) are third pillar strategies that provide a tax-sheltered means for saving among non-workers as well as workers and their families. These plans have grown slowly over the past decade as wages have stagnated or fallen for middle and lower wage workers with most of these accounts used as tax-shelters for middle and upper-income groups (Munnell et al. 2002a, b; VanDerhei and Copeland 2001).

A Choice Not to Save? Or Increased Risks to Savers? Most U.S. workers have been in their peak earnings years over the past two decades and have also become stock and bond investors who have saved very little in their occupational and individual retirement accounts. The questions raised with respect to this low savings rate are whether Americans just will not save or whether they are facing highly *individualized sequences of risk* that derail individual savings. As they attempt to accumulate adequate balances in these plans by retirement ages, workers face multiple risks and obstacles (see Shuey and O’Rand 2004). Employment risk in an era of downsizing, mergers and retrenchment begins a protracted risk process. Getting and keeping a job are the first challenges to retirement saving, followed by the risk of low or stagnating wages. Average wages in the U.S. stalled from the mid-1980s through 2000 and fell for the lowest earning groups (Levy 1998). Lower-wage and younger workers are discouraged from DC pension saving since they have lower incomes to begin with and they benefit less from the tax shelter. Munnell and Sundén (2004) reported that only one in ten participants contributes the legal maximum to their DC accounts; fifty-eight per cent of those earning \$100,000 or more

contribute the maximum, while only one per cent of those in the \$40,000 to \$60,000 salary range do so. They also report that participants do not adequately diversify their portfolios across market risk categories and over-invest in company stock. The notorious Enron scandal is emblematic of the consequences for workers whose pensions are primarily constituted of company stock.

By 2005, concern that a significant number of workers covered by DC plans were not participating in them led to recommendations that employers automatically enroll new employees in their DC plans and let them opt-out; the logic underlying this recommendation was the observation among pension and financial analysts that workers tend not to change their initial compensation arrangements (Munnell et al. 2002b; Munnell and Soto 2003). But the risk of non-participation among covered workers is still high. Other risks include (1) the variability in the extent to which employers match workers' contributions levels, which if absent or low may further discourage worker participation and (2) the temptation to borrow from or cash-out account balances for other family needs such as job loss, hospitalization, children's education, or homeownership. Of course, the ultimate risk for workers across the wage distribution is the market itself, or financial risk.

The Financial Risks of Private Individual Accounts. A recent analysis of the extent of financial risks that the hypothetical DC pensions of U.S. workers over the 20th century would have obtained if they had accumulated individual retirement accounts is presented by Gary Burtless (2000, 2004). He tracked hypothetical workers for a century beginning with the first worker who enters the labor force in 1871 and retires in 1910 and ending with the last worker who enters the labor force in 1963 and retires in 2003. He assumed workers have identical careers, contribute fixed percentages of their wages to investment accounts and convert their balances to level annuity streams. He also assumed that workers differ in their exposure to stock market returns, bond interest rates and price inflation given *the differing start and end dates of their respective careers*. He applied these fixed and variable factors to estimate replacement rates (i.e., the per cent of pre-retirement incomes replaced by retirement benefits). He found financial risks to be quite large with average pre-retirement peak earnings replacements of 52 per cent that range between 20 and 150 per cent. Workers who follow identical investment strategies but retire a few years apart can receive dramatically unequal pensions. Meanwhile, all

Table 19.2 Replacement rates for simulated DC pensions in the U.S. in selected years

1940	50 %	↓	Post World War II Posterity
1950	35 %		
1960	90 %		
1970	140 %	↓	Economic Structuring & Population Aging
1980	58 %		
1990	65 %		
2000	150 %	↓	Bubble
2003	58 %		Bust

Source: Burtless (2004).

private annuity pension recipients are rarely protected against inflation. The risks are borne by individuals and cannot be spread over a broader population of contributors and beneficiaries.

Some of his specific findings appear in Table 19.2. The period between 1940 and 1970 is characterized by increasing prosperity, especially after 1950. By and large, estimated replacement rates for hypothetical DC pensions rise and exceed 100 per cent of earnings by 1970. After 1970, economic restructuring has an increasingly pervasive impact on the U.S. economy, beginning with the shrinking manufacturing (especially the automobile industries) sectors and spreading by the late 1990s to other sectors, including communications and financial sectors. The latter period witnesses a drop in replacement rates to between half and two-thirds of pre-retirement earnings. The stock market bubble at the turn of the 21st century brings a spectacular increase in the replacement rate, followed shortly thereafter by the market bust that produces a nearly 100 per cent reduction in the replacement rate.

Burtless (2004) extended this analysis to compare the rates of investment return to individual retirement accounts in five countries between 1927 and 2002. He performed a similar simulation in which workers with identical careers and investment patterns face different financial (stock and bond market) risks depending on the start and stop dates of their careers and differ-

ent national contexts. As in the U.S. study above, he found large risks over time. He compared the annual real investment returns (from stocks and bonds) to individual accounts between 1927 and 2002 in France, Germany, Japan, the U.K. and the U.S. The volatility of the first three markets over time is even greater than that for the U.S. He reported lower average investment returns to France, Germany and Japan and larger standard deviations in their real investment returns over the period. The U.S. and the U.K. are approximately equal in their returns with the U.S. performing slightly better in stocks and the U.K. slightly better in bonds.

As more countries debate the adoption of individual retirement accounts as part of their public pension schemes, either as a separate tier in the system or as a component of the basic public pension, the element of financial risk may be ignored or minimized following a logic of efficiency that will place entire pension systems in some jeopardy especially during periods of global recession. Recent efforts in the U.S. to privatize portions of the Social Security system have provoked considerable resistance from the population but the issue is likely to reappear on the agendas of government bureaucrats and political figures (Hardy and Hazelrigg 2007; Thompson 2006).

Population Aging Across Countries and Other Demographic Transitions

The devolution of risks is not only a response to globalization and price competition in the U.S. and elsewhere. It is driven by demographic pressures stemming from population aging, “defamilization” (Esping-Andersen 1999) and immigration across countries and – in turn – it is exacerbating these demographic trends in a feedback process. Individualized policies diminish the culture of shared risks and emphasize individualized choices. The major demographic influences on and outcomes of the devolution of risk are summarized below.

Two demographic transitions challenge the welfare state. The first is the long-developing demographic transition, during which declining fertility and mortality rates have accompanied national economic and social development throughout the world. The transition has spread from the western advanced industrial societies to the developing world. It continues in the current context with the declines in fertility leading to below replace-

ment levels and the deceleration of mortality at older ages resulting in ever-increasing life expectancies (Kinsella and Phillips 2005). Hence, population aging supersedes population growth in this phase of the transition at the turn of the 21st century, especially in the richest societies. Medium demographic projections of country age structures by 2050 calculated by the United Nations Population Division portray the rectangularization of age structures across levels of development, though the highest age levels are achieved in the developed world (Borgmann 2005). The median age in the developed world is approximately 37 years, up from 29 years in 1950 (Bongaarts 2004). These trends have increased old age dependency ratios to upwards of 25 per cent in Europe and 19 per cent in the U.S. and Japan.

However, these old age dependency ratios are not as threatening of old social contracts as the pensioner/worker ratios. Here globalization and old social contracts are in direct confrontation. In the U.K. and Europe pensioner/worker ratios hovered in 2000 around 0.4 to 0.5, with Italy’s a startling 0.71 (projected to reach 1.5 by 2050 if the contract is not changed) (Bongaarts 2004). The U.S. has among the lowest ratios at 0.28 but it now faces the looming retirement of the post World War II baby boomers, which will accelerate the increase of this ratio, though opinions vary on the rate of this increase over the 20-year period that this cohort is expected to retire (Hughes and O’Rand 2004).

The ratios are attributable to early retirement trends that have emerged in tandem with economic restructuring and labor market dislocations that have mounted over thirty years and to relatively generous pension benefits for dependent aging populations. Social Rights welfare regimes have extended generous benefits to retired workers at early ages – ages far younger than the age of 65 used to define “old age” dependency in international estimates (Bongaarts 2004). Even the U.S. experienced a trend towards early retirement under its Liberal regime as a result of generous defined benefit pensions (which employers claim are no longer sustainable) and generous early retirement benefits under Social Security. The 1983 Amendments to the Social Security Act in fact legislated a phased reduction of these early benefits and a delay in the age of eligibility for full benefits until 66 and then 67 in anticipation of the retiring baby boomers that some argue has already stalled or even reversed the early retirement trend (Quinn 1997).

Defamilization is another factor contributing to population aging, especially in Anglo-European countries (Esping-Anderson 1999). This pattern is related to what has also been referred to as the *second demographic transition* in advanced societies. This transition was initiated in the 1960s when other demographic changes related to labor force participation and household formation began to emerge (Lesthaeghe and Moors 2002). Women's labor force participation and sustained work attachment across adulthood, which had steadily increased earlier in the century with few interruptions, accelerated after 1960. This was partly a response to the expansion of education and to women's improved educational attainments. Educational attainment and employment were also aided by contraceptive technologies that facilitated the postponement of childbearing (Richards 2004). Relatedly, the age at first marriage rose after it had fallen over the post World War II period. Premarital and post marital cohabitation increased along with childbearing in these unions and childbearing outside of marriage and cohabitation also increased. Concurrently, divorce and separation rates rose and fertility was postponed. All of these changes served to erode traditional family structures (to defamilize) and the gender roles defined by them. Family policies predicated on bread-winner models of the family no longer matched the demographic realities.

Finally, increased immigration from developing countries, typically associated with the colonial histories of western countries but also influenced by the fall of the Soviet state, began to strain the public systems of different welfare states and to present new political challenges to market and family policies (Esping-Anderson 1999; Pressman 2001; Immergut et al. 2007).

International Shifts in Pension Policies

The distances between average life expectancies of women and men and statutory retirement ages in public programs and age-eligible retirement ages in private plans have grown, creating what some have called a "global pension crisis" that calls for "responsible accumulation" (Blackburn 2006). Figure 19.2 compares the differences between average life expectancy and statutory early retirement ages for men and women

workers in 18 countries as of 2002. The disparities between life expectancy and the earliest pensionable ages of men and women vary slightly from country to country. The gender differences in life expectancy are generally consistent but gender-specific versus gender-neutral policies related to retirement timing vary. In the case of the U.S., age 62 is the earliest pensionable age for all workers and 65 the normal age – at least until the baby boom cohorts begin to retire; then full benefits will be extended to age 66 for the early boomer cohorts and continue to shift upward to age 67 for the later boomers and younger cohorts. In addition, the levels of early benefits at age 62 will be cut for these groups to discourage early retirement in the future.

The important point to note here is how variable specific policies are across countries, warning against too much generalization about the direction of shifts across countries. European systems are based on three pillars: PAYGO plans, occupational pensions and other savings. But rules vary related to minimum work requirements, fundedness, benefit indexation, redistribution, pension type and many other factors. Hence, multiplex incremental changes tend to dominate even though European populations may not view them as incremental.

Some countries are shifting their gender-related policies and also changing tax and benefit schedules (Feldstein and Siebert 2002; Gern 2002; Clark, Munnell and Orszag 2006). The United Kingdom, Japan and Germany have adopted gender-neutral policies since 2002 to be implemented over future years to raise statutory retirement for men and women to age 65 with no earlier option for future cohorts. Austria and Japan have retained early retirement options but made full retirement the same for women and men at age 65. Sweden, which has been among the most socially democratic welfare systems, has shifted towards policies to discourage early retirement by linking benefits to individual contribution levels, while still retaining gender-neutral early and late age thresholds (U. S. Social Security Administration 2002a, b, 2006).

Notional defined contribution (NDC) systems are receiving equal attention in Europe and beyond. These take two forms: the first includes individual retirement accounts within the public retirement systems of some countries. Sweden and Poland have mandatory contributions by workers in their PAYGO systems

Fig. 19.2 Earliest retirement age and life expectancy by gender across 18 countries in 2002



Source: Life expectancy data are from the Population and Statistics Divisions of the UN Secretariat [<http://unstats.un.org/unsd/demographic/social/health.htm>]. Pension data are from the U.S. Social Security Administration (2002a, b).

credited to such accounts without an investment component (the latter characterizes the DC accounts in the private sector). The other consists in mandatory contribution accounts that are privately managed (closer to a Chilean form) and more evident in Eastern European countries (Sinha 2000).

The distributions of DB and DC plans in the first and second pillars are also highly varied. In the pension systems of OECD countries, Whiteford and Whitehouse (2006) reported that DB plans are the most widespread first pillar/second tier pensions (they found them in 17 countries) followed by DC plans. But most DC plans are stand alone second pillar private plans or supplemental private plans attached to public DBs.

Perhaps the most comprehensive recent study of pensions in Europe appears in *The Handbook of West European Pension Politics* edited by Immergut, Anderson and Schulze (2007). Drawing on the World Bank's 1994 model, they and their other contributors systematized diverse pension systems across countries within a *pillars and tiers model* (see Fig. 19.3). The pillars describe the public, occupational and individual private sectors, respectively. The tiers stratify the pillars according to whether they are mandatory or voluntary and by whether benefits are flat rates or

earnings related, targeted to specific subgroups, DB or DC and more. The distinctive characteristics of these alternatives across countries are highly varied and historically contingent on welfare state legacies and recent politics.

The general framework appears in Fig. 19.3. We have assigned countries to pillar/tier intersects where their policies appear to fit but we do so with a few warnings to the reader. Specific country policies vary considerably, even if they are assigned to the same pillar/tier category. For example, in pillar one, we have collapsed basic pensions and means-tested social assistance categories because they are usually present in a single country but this is not always the case. Some countries have only earnings-related pensions in pillar one plus means-testing or social assistance and no basic pension (e.g., Portugal). Some have only basic pensions and means-testing (Ireland, the Netherlands and Switzerland). And, often first and second tiers in pillar one are integrated programs (Austria, Germany, Sweden, Denmark, Italy, Belgium, Luxembourg, Finland and France).

Second, in pillars two and three and in pillar one/tier three, selected policies related to private voluntary individual accounts or subsidized or mandatory occupational accounts may be available only

	First Pillar Public Sector (PAYGO)	Second Pillar Occupational Sector (Public & Private)	Third Pillar Private Individual Sector
Third Tier	7 Individual Funded Accounts <i>Denmark, Greece, Portugal, Spain, Sweden</i>	8 Voluntary Occupational Pensions <i>Austria, Germany, Greece, Ireland, Netherlands, Switzerland, UK, USA</i>	9 Voluntary Private Pensions or Savings <i>Belgium, France, Greece, Luxembourg, Portugal, Switzerland, UK, USA</i>
Second tier	4 Earnings-related Pensions <i>Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Luxembourg, Portugal, Spain, Sweden, UK, USA</i>	5 Government Subsidized or Tax-Sheltered Occupational Pensions <i>Austria, Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Sweden, UK, USA</i>	6 Government Subsidized Private Pensions <i>Denmark, France, Finland, Germany, Ireland, Italy, Sweden, Switzerland, UK, USA</i>
First Tier	1 Basic Pensions (e.g. flat rate) &/or Means-tested and Social Assistance Substitutes for Minimum Pensions <i>Austria, Belgium, Denmark, France, Finland, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, Switzerland, UK, USA</i>	2 Mandatory Occupational Pensions <i>Denmark, Italy, Netherlands, Sweden, Switzerland</i>	3 Mandatory Private Pensions

Source: Immergut, Anderson and Schulze (2007).

Fig. 19.3 Pension systems in Europe and the U.S.

to selected plans or occupational groups or earnings or contribution classes. For example in Switzerland, mandatory occupational pensions are imposed on employees earning at least twice the minimum basic pension base salary and in Ireland, only members of pillar two/second tier occupational pension schemes

can qualify for pillar two/tier three voluntary (supplemental) pensions. Such specific variations are pervasive across countries. Finally, many countries have yet to implement new policies that have been scheduled to phase-in in the future or are under consideration with regard to pillar two and pillar three DCs,

DBs, IRA-like accounts, insurance policies and other related retirement savings instruments.

The tiers move upward from universal mandatory systems in the bottom first tier through earnings- or work-related systems in the second tier to individual funded or voluntary occupational pensions or private accounts at the top. Very detailed inventories of rules and practices across the pension systems in 16 European countries are categorized across the nine cells; the relative location of each country in, and the specific contents of, these cells are presented in rich appended materials. Also, important to note is that these countries have arrived at these structures incrementally over time and at different times in the past two decades under different political regimes. Finally, Immergut et al. (2007) might disagree with some of our assignments.

The first pillar is somewhat less relevant to the assigned topic of this chapter since it focuses on the public pension system. However, the addition of individual accounts to the first pillar public pension system in recent years in at least five European countries where collectively-oriented universal public pension systems have dominated is notable. And, while Swedish individual accounts may not be equivalent to U.S. 401 ks, the move to such accounts in a social democratic state is a shift towards individualization. Sweden, for example, introduced defined contribution plans financed on a PAYGO basis in 1998. The reform has taken a decade to achieve full implementation (Sundén 2006). A third pillar/ second tier of funded individual accounts was also introduced but recent studies indicate that it has experienced several challenges, chief among them a too wide range of investment choices that have perplexed and discouraged participation. Spain does not appear in the second and third pillars at all and, according to demographic projections, its rate of population aging is among the highest in Europe, perhaps second only to Italy. Its continued dependence on a public sector only system is in jeopardy. The third tier individual funded accounts in Spain are state-managed funds available only to high-level state employees as components of their total pension packages. Most other countries have introduced individual accounts comparable to defined contribution plans in their second or third pillars and many have both DB and DC or hybrid plans as supplemental to first pillar/first tier plans. Finally, Austria currently has no third pillar policies; but this may not be the case in the future.

The diversity in the mix of pillar/tier arrangements across countries reflects their welfare state legacies in many respects, although some breaks are also notable. In the next section we will briefly review the policies of the U.K., four European countries, Japan and selected Latin American countries. The materials are taken from the Immergut et al. database (2007) and two websites: the European Industrial Relations Observatory (EIRO) that reports ongoing news and policy changes in all aspects of European industrial relations [www.eurofound.europa.eu/eiro] and the U.S. Social Security Administration's online update of international pension policies [www.socialsecurity.gov/policy/docs/prodesc/intl_update/].

The U.K. The U.K.'s pension system has shifted away from the Beveridge public model following World War II towards an increasingly privatized system of occupational pensions and private individual savings (Banks and Smith 2006; Hills 2006). A key element of the current system is that workers are encouraged to "contract out" their first pillar/second tier earnings-related pensions to second pillar pension schemes; those who do not move to the second pillar remain in the public sector. The second and third pillars are quasi-mandatory systems in which employers are required to offer a diverse array of defined benefit and defined contribution instruments, while for workers and the self-employed the choice is voluntary (Whitford and Whitehouse 2006). The "contracted out" pensions are labeled as stakeholder pensions (indicating that greater personal responsibility is assumed by workers who contract out) and are offered at the occupational and the individual levels.

The goal of the U.K. system in the near future is to move approximately two thirds of its workforce into the second and third pillars for coverage of earnings-related pensions; today about half employees are in non-state pension plans. The replacement of DB plans with DC plans in the occupational sector is moving at a pace parallel to that observed in the U.S. in the previous two decades. Finally, the most recent initiatives in the U.K. are concentrating on helping older workers remain in the workforce using several strategies, chief among them the extension of the gender-neutral state pension age from 65 to 68 by 2044. Both men and women will be required to contribute to their state pensions for a minimum of 30 years, with weekly credits for family care obligations factored into their eligibility.

Australia. Australia also follows a liberal model that includes a means-tested old age pension, a mandatory occupational pension system in the private sector and a voluntary savings scheme. Like the U.K. it has tilted away from the public sector but with a more radical objective to replace the public system altogether.

Sweden. Sweden has been the model of the social democratic welfare state legacy since early in the twentieth century (Esping-Anderson 1999; Anderson 2004). However, it has reformed its pension system extensively over the past several decades, first by adding an earnings-related public DB pension to its basic and then by replacing the earnings-related component most recently with an earnings-related notional defined contribution (NDC) plan within the PAYGO system, which is called an income pension (Whiteford and Whitehouse 2006). The NDC is based on contributions from lifetime earnings and although it is not fully funded it “emulates a funded defined contribution scheme by estimating an internal rate of return for accumulated pension contributions” (Immergut et al. 2007: 366). At retirement, which can be as early as age 61, the account is converted to an annuity.

A third-tier defined contribution individual funded account, called a premium pension, has also been added to the first pillar. In the second pillar defined benefit occupational pensions are available to different labor force segments across the public and private sectors. Voluntary private savings in defined contribution plans in the third pillar have tax shelter support.

Germany. Germany reflects the continental model of welfare states referred to as a corporatist model with uneven support of different segments of the workforce coupled with family support systems. Earnings-related pensions dominate the first and second pillars. It has moved since 1990 to strengthen the second pillar with a mix of employer- and employee-funded occupational pensions. It compels employers to offer at least one type of occupational pension, which is voluntary for the worker and managed by a consortium of private financial service companies. Tax subsidies are a core feature. Over 40 per cent of German workers were covered by an occupational pension in 2003 (EIRO). DC plans arrived for the first time in Germany in 2001 and appear to be increasingly preferred by employers while the private individual voluntary sector is growing. Also, it has moved to reduce benefits before age 65 (Whiteford and Whitehouse 2006). Pension coverage levels are

much higher in the region that was West Germany before the fall of the wall, with East German retirees more dependent on social assistance in retirement – a dependence that has meant that public transfers from western to eastern workers are considerable.

Finland. The Finnish government's priorities have been to buttress the first and third pillars since it has not experienced the pressures of population aging as severely as other European nations so far. Until 1996, all pensioners received a universal basic national pension. But after 1996, the basic pension became subject to means-testing and hence was abolished for most pensioners. In its place for most workers was added a mandatory earning-related component in the form of an occupational pension with employer and employee contributions. Today, unlike other countries in the European Union, it classifies occupational pensions that target different occupational groups as first pillar; changes in pensions schemes are negotiated between employers and unions with limited government intervention. The third pillar in Finland is very limited with some voluntary private pensions with subsidization through tax relief.

The Netherlands. The Netherlands has a public flat-rate pension and social assistance only in the first pillar. The second pillar has a long history in the Netherlands where occupational plans have existed within sectors of workers and in companies (Anderson 2004). These are quasi-mandatory subsidized occupational pensions, with employer obligations to provide coverage and with pension contributions set by collective wage bargaining between employers and workers.

Japan. Japan has the oldest public pension system among East Asia countries, beginning with coverage for military personnel in 1890 that was extended to civil servants later. It implemented a first pillar employees' pension insurance in 1941 to which a national pension was added in 1959. The first pillar consists in a flat rate universal benefit and an earnings-related insurance system. The second pillar was established in 1942 and has developed over time to include multiple DB and DC plans. Company-based private pensions are allowed to partially “contract out” of the earnings-related public system – somewhat like the U.K. – in return for lowering their contributions to the public sector (Phang 2006). The pensionable age has increased from 60 to 65.

Developing Countries in Asia and Latin America. Many developing countries in Asia and Latin America have moved relatively more quickly into more

privatized pension systems as newcomers to welfare policies with lower levels of national resources for universal coverage. But, their institutional arrangements vary significantly. In Southeast Asian cases, strong government control is a dominant feature. The case of Singapore, for example, is one in which individual pension accounts in the first pillar are managed by the government that behaves like a monopoly in a single mandatory savings scheme (Sinha 2000; Phang 2006). In the Latin American case, where low trust in government tends to predominate across countries, the multi-pillar approach is preferred with developing mixes of first, second and third pillar arrangements across countries. Venezuela and Costa Rica, for example, appear to be moving to the World Bank's model (of course, with detailed differences between them); others are giving priority to the second pillar emphasizing fully-funded (sometimes mandatory) occupational pensions. Nicaragua, Honduras, Guatemala and Dominican Republic appear to be moving in this direction. But, these are all works in progress in early stages.

Chile has the most liberal reforms that were initiated in 1980 after long-term solvency problems in the public system. The reform consists in mandatory tax-sheltered occupational pensions and voluntary accounts. Several alternative funds are offered to workers who choose from, and can switch among, them. The system has faced numerous challenges over two decades related to transaction costs and economic downturns but its fundamental structure remains (Mesa Lago 2002; Sinha 2000).

Finally, proposals and reforms are not unaccompanied by some social upheaval. Pension proposals in Brazil in 1998 called for closer links between benefits and years of contribution in the earnings-related first pillar. A central motivation for the reform was to end sustained cycles of super-inflation. Implementation of these reforms has provoked large strikes and protests, which effectively brought about a change in government. Currently, 20 per cent of Brazil's GDP is derived from supplemental forms of pensions (essentially defined contribution plans).

Conclusions

In short, retirement policy is on the table throughout the world (U. S. Social Security Administration 2002a, b; 2006). Some developing countries (like Spain and

China) have moved to gender-neutral policies, while others (like Brazil) have not. Key concerns of these countries are centered on economic development and the inclusion of larger proportions of their populations in the formal economy. But, above and beyond economic development issues, the demographic pressures of population aging and the changing roles of women in the marketplace are relevant to the development of retirement and family policies everywhere.

Other kinds of policies are also on the table, including active labor market policies related to age-groups and non-native labor forces, family policies related to child and maternal support structures and national health care policies targeted to vulnerable populations (e.g., children and the elderly). The complement of these policies and those related to social and private pensions and health insurance lead to variability in income inequality across countries: the greater the privatization or individualization of policies the greater the income inequality (Pressman 2001).

Bongaarts (2004) argued that advanced countries in particular must adopt multi-strategy packages to deal with projected PAYGO system shortfalls. He proposed minimal changes that will be required in G7 countries to reduce public pension expenditures by 2050. He calls for fertility incentives, increases in net immigration, increases in the ratio of employed workers to retirees, delayed eligibility for retirement benefits and reduced benefits. All proposals face political resistance in one form or another and/or at different levels of intensity across countries. Nevertheless, proposals that seek to anticipate such changes emerge regularly.

The World Bank's 1994 proposal of three pillars of retirement income planning is perhaps already becoming obsolete with *earnings/work* being considered more and more as the *fourth pillar* (c.f. proposal by the Geneva Association in Switzerland). The extension of active life expectancies in the advanced countries, coupled with public sector policies increasing eligibility ages and private sector retirement savings risks, may increase the appeal of working later, albeit against resistance to this idea on the European continent.

The emerging fourth pillar is more evident in the projections of the U.S. baby boomers (born between 1946 and 1964) at age 67 reported by Butrica, Iams and Smith (2003/2004). The first baby boomer turned 62 in 2008 and will be 67 in 2013. The Social Security System has already shifted retirement ages for these cohorts to later years and has reduced benefits,

especially early retirement benefits. The boomers will have higher incomes and less poverty than earlier cohorts but their replacement rates will be lower. Moreover, the system has reduced earnings penalties on retiree benefits. Finally, younger cohorts, especially the late boomers (born between 1955 and 1964) have worked more under the expanding DC occupational pension regime than earlier cohorts; they will retire more than any other cohort to privately invested defined contribution accounts.

The Social Security projections that Butrica and her colleagues (2003/2004) reported are drawn from the Survey of Income and Program Participation. They predicted that boomers will stay in the workforce later and that earnings will contribute more to their incomes at age 67 than earlier cohorts. Policy changes provide incentives for this but demographic decisions regarding work, leisure, consumption levels etc., probably play an important role too.

Recent reversals in the trend towards early retirement, increases in the variability in the age at retirement and rising post-retirement re-entry into employment among men and women portend a possible de-institutionalization of retirement (Quinn 1997). A recent study following workers into retirement between 1992 and 2000 (using the Health and Retirement Study) found a remarkable set of nontraditional patterns (Maestas 2005). One-half of the subjects followed nontraditional patterns over this period. These patterns consisted primarily in partial retirement or reversals of retirement (termed "unretirement" by the author). One-fourth of retirees reversed their retirement; one-third of the younger retirees did so (age 51–56) as did one-fifth of the older retirees (age 61–66).

These trends in the U.S. are preceding the actual implementations of *both* legislative changes in age-eligibility for Social Security for baby boomers set down in the 1983 amendments of the Social Security Act *and* the lifting of earnings limits for Social Security benefits in retirement. They reflect the weakening of age-based institutional life-course schedules and the increase in individualization stemming from increased active life expectancy in the population, extensive variability in lifetime transitions patterns, economic inequality and the increased devolution of pension risks (O'Rand 2003, 2006).

These individualization patterns are not as pronounced in other countries with historically stronger

state structures. But they will probably spread in the coming century as private retirement systems continue to grow and evolve and become interdependent across countries. Occupational and individual pension funds are significant players in global financial markets that transcend national boundaries. Private (and some public) pension funds are large investors in global markets and, indirectly, in each other. An implication of this is that pension systems are becoming globalized and possibly vulnerable to each other's (in)solvency. Finally, the global influence of organizations like the World Bank is contributing to this process, especially in the developing countries (World Bank 2005).

References

- Anderson KM (2004) Pension politics in three small states: Denmark, Sweden and the Netherlands. *Can J Sociol* 29:289–312
- Banks J, Smith S (2006) Retirement in the U.K. *Oxf Rev Econ Policy* 22/1:40–56
- Blackburn R (2006) The global pension crisis: From gray capitalism to responsible accumulation. *Polit Soc* 34:135–186
- Bongaarts J (2004) Population aging and the rising cost of public pensions. *Popul Dev Rev* 30/1:1–23
- Bonoli G (2003) Two worlds of pension reform in Western Europe. *Comp Polit* 35/4:399–416
- Borgmann C (2005) Social security, demographics, and risk. Springer, Berlin
- Buessing M, Soto M (2006) The state of private pensions: Current 5500 data. Issue Brief 2006-42. Boston: Center For Retirement Research at Boston College. [www.crr@bc.edu]
- Burtless G (2000) Social security privatization and financial market risk: Lessons from U.S. financial history. In: Ihori T, Tachibanaki T (eds) *Social security reform in advanced countries*. Routledge, London/NY
- Burtless G (2004) Asset accumulation and retirement income under individual accounts: Evidence from five countries. In: Onofri P (ed) *The economics of an ageing population: Macroeconomic issues*. Elgar, Cheltenham UK, pp 227–250
- Butrica BA, Iams HM, Smith KE (2003/2004) The changing impact of social security on retirement income in the United States. *Soc Secur Bull* 65(3):1–13
- Clark GL, Munnell AH, Orszag JM (eds) (2006) *The Oxford handbook of pensions and retirement income*. Oxford University Press, Oxford
- De Mesa AA, Mesa-Lago C (2006) The structural pension reform in Chile: Effects, comparisons with other Latin American reforms, and lessons. *Oxf Rev Econ Policy* 22/1:149–167
- Esping-Andersen G (1999) *Social foundations of postindustrial economies*. Oxford University Press, New York
- Feldstein M, Siebert H (eds) (2002) *Social security pension reform in Europe*. University of Chicago Press, Chicago

- Gern, K-J (2002) Recent developments in old age pension systems. In Feldstein and Siebert (eds): 439–478
- Hacker JS (2006) *The great risk shift: The assault on American jobs, families, health care, and retirement and how you can fight back*. Oxford University Press, Oxford
- Hardy M, Hazelrigg L (2007) *Pension puzzles: Social security and the great debate*. Russell Sage, New York
- Hills, J (2006) A new pension settlement for the twenty-first century? The UK's pensions commission's analysis and proposals. *Oxf Rev Econ Pol* 22/1:113–132
- Hinz R (2000) Overview of the United States private pension system. *Private Pension Systems and Policy Issues*, No. 1. Paris, OECD
- Hughes ME, O'Rand AM (2004) *The lives and times of the baby boomers*. Population Reference Bureau and Russell Sage Foundation, Washington DC/New York
- Immergut EM, Anderson KM, Schulze I (eds) (2007) *The handbook of west European pension politics*. Oxford University Press, Oxford
- Institute of Medicine (2003) *Hidden costs, value lost: Uninsurance in America*. National Academy Press, Washington DC
- Kinsella K, Phillips D (2005) The demographic drivers of aging. *Popul Bull* (March):8–11
- Lesthaeghe R, Moors G (2000) Recent trends in fertility and household formation in the industrialized west. *Rev Popul Soc Policy* 9:121–170
- Levy F (1998) *The new dollars and dreams*. Russell Sage Foundation, New York
- Maestas N (2005) Back to work: Expectations and realizations of work after retirement. RAND Labor and Population Working Paper WR-196-1. Santa Monica, CA
- Mesa-Lago C (2002) Myth and reality of pension reform: The Latin American evidence. *World Dev* 30:1309–1321
- Munnell AH, Sundén A, Lidstone E (2002a) How important are private pensions? Issue Brief 2002-2008. Boston: Center for Retirement Research at Boston College [www.crr@bc.edu].
- Munnell AH, Sundén A, Taylor C (2002b) What determines 401(k) participation and contributions? *Soc Secur Bull* 64(3):64–75
- Munnell AH, Soto M (2003) The outlook for pension contributions and profits in the US. Working paper 2003-13. Boston: Center for retirement research at boston college [www.crr@bc.edu]
- Munnell AH, Golub-Sass F, Soto M, Vitagliano F (2006) Why are healthy employers freezing their pensions? Issue Brief 2006-44. Boston: for the center for retirement research at Boston College [www.crr@bc.edu]
- Munnell AH, Sundén A (2004) Coming up short: The challenge of 401k plans. Brookings Institution, Washington DC
- O'Rand AM (2003) The future of the life course: Late modernity and life course risks. In: Mortimer JT, Shanahan M (eds) *Handbook of the life course*. Plenum, New York, pp 693–701
- O'Rand AM (2006) Stratification and the life course: Life course capital, life course risks and social inequality. In: Binstock RH, George LK (eds) *Handbook of aging and the social sciences*, Elsevier, Boston, pp 146–165
- Phang HS (2006) Retirement income systems in Asia. In: Clark, Munnell and Orzag (eds) (799–815)
- Pressman S (2001) The decline of the middle class: An international perspective. LIS Working Paper 280. Luxembourg Income Study, Syracuse University, Maxwell School of Citizenship & Public Affairs.
- Purcell PJ (2002) Pension sponsorship and participation: Trends and policy issues. *Soc Secur Bull* 64(2):92–103
- Quinn J (1997) Retirement trends and patterns in the 1990s: The end of an era? In: National Academy on Aging, Public Policy and Aging Report. National Academy on Aging, Washington DC, pp 10–14
- Rappaport AM, Young ML, Levell CA, Blalock BA (1997) Cash balance pension plans. In: Gordon MS, Mitchell OS, Twinney MM (eds) *Positioning pensions for the twenty-first century*. The Wharton School of the University of Pennsylvania and the University of Pennsylvania Press, Philadelphia, pp 29–44
- Richards M (2004) Assisted reproduction, genetic technologies, and family life. In: Treas SJ, Richards M (eds) *The blackwell companion to the sociology of families*, Chap. 27. Blackwell, London, pp 478–514
- Shuey K, O'Rand AM (2004) New risks for workers: Gender, labor markets and pensions. *Ann Rev Sociol* 30:453–477
- Sinha T (2000) Pension reforms in Latin America and its lessons for international policymakers. Kluwer Academic Publishers, Boston
- Smith KE, Johnson RW, Muller LA (2004) Deferring income in employer-sponsored retirement plans: The dynamics of participant contributions. Working paper 2004-20. Boston: Center for Retirement Research at Boston College [www.crr@bc.edu]
- Sundén A (2006) The Swedish experience with pension reform. *Oxf Rev Econ Policy* 22(1):133–148
- Thompson L (2006) The US retirement income system. *Oxf Rev Econ Policy* 22/1:95–112
- Twinney MM (1997) A fresh look at defined benefit plans: An employer perspective. In: Gordon MS, Mitchell OS, Twinney MM (eds) *Positioning pensions for the twenty-first century*. The Wharton School of the University of Pennsylvania and the University of Pennsylvania Press, Philadelphia
- U.S. Social Security Administration (2002a) *Social security programs throughout the world: Europe*. Social Security Administration, Washington DC
- U.S. Social Security Administration (2002b) *Social security programs throughout the world: The Americas*. Social Security Administration, Washington DC
- U.S. Social Security Administration (2006) *Social security programs throughout the world: Asia and the Pacific*. Social Security Administration, Washington DC
- VanDerhei J, Copeland C (2001) The changing face of private retirement plans. EBRI Issue Brief Number 232. The Employee Benefit Research Institute, Washington DC
- Whiteford P, Whitehouse E (2006) Pension challenges and pension reforms in OECD countries. *Oxf Rev Econ Policy* 22/1:78–94
- Wooten J (2005) *The employee retirement income security act of 1974: A political history*. University of California Press, Berkeley
- World Bank (1994) *Averting the old age crisis: Policies to protect the old and promote growth*. Oxford University Press, Oxford
- World Bank (2005) *Old-age income support in the 21st century: An international perspective on pensions systems and reform*. World Bank, Washington DC

Chapter 20

Employment at Older Ages

Sara E. Rix

Introduction

Work gives structure and meaning to daily life. People work because it provides them with something to do, the opportunity to make a contribution, a ready social network and, of course, earnings. For most Americans, access to health insurance requires an employer.

People are identified and ranked by their paid work; obituary headlines in major newspapers such as the *Washington Post* prominently highlight decedents' occupations. Whereas dress and accent might once have established pecking order in the social hierarchy, employment and, more specifically, occupation help do that today.

Despite its importance in shaping who and what we are, work consumed a shrinking portion of the average lifetime for much of the 20th century in the United States, due in large part to early retirement among men and increased life expectancy. The same was true throughout the industrialized world, including Japan, where labor force participation rates at upper ages have been and remain generally higher than those in Western nations (see International Labor Office, LaborSta Internet, available at <http://laborsta.ilo.org>).

Although retirement came to characterize old age in the decades following World War II, the decline in labor force participation among older men in the United States actually began decades earlier. In 1900, nearly two-thirds (63.1 per cent) of men aged 65 and older were in the labor force. By 1940, that was the case for just over two-fifths (41.8 per cent) (U.S. Department of the Commerce 1975, Table D29-41). Participation

rates for women aged 65 and above hovered around 6 per cent to 8 per cent over the same period.

The following pages examine the changing labor force participation and employment patterns of older men and women. Although the primary focus is on older Americans, developed countries other than the United States face demographic and economic challenges, particularly with respect to their public pension systems, which have prompted governments to reevaluate policies that encourage retirement and to implement policies to promote employment. Various sections of the chapter incorporate material on what is happening in some of those countries. Unless output per worker increases, the shrinking labor forces projected as a result of demographic aging in developed countries promise slower growth in living standards.

This chapter uses the words “work” and “employment” interchangeably, rather than distinguishing between work as a “purposeful activity directed at producing a valued good or service” (Kelloway et al. 2004: 109) and employment as the arrangements under which work occurs.

Trends in Labor Force Participation Rates of Older Americans – Looking Back Over 50 Years

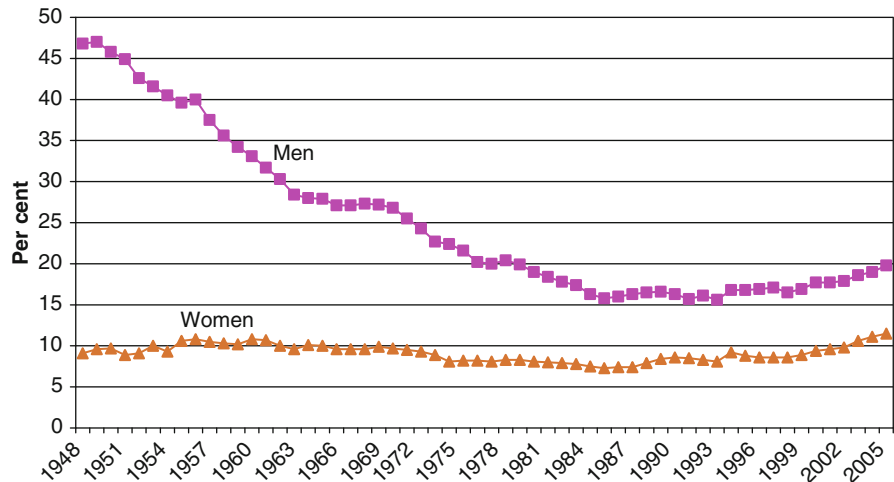
The Post-World War II Years Through 1985

The war years saw a slight but short-lived increase in the labor force participation of older men and women

The views expressed in this chapter are those of the author and do not necessarily represent official policy of AARP.

S. E. Rix
AARP Public Policy Institute
601 E Street, NW
Washington, DC 20049, USA
E-mail: srix@aarp.org

Fig. 20.1 Labor force participation rates for men and women aged 65 and older, 1948–2005



Source: U.S. Department of Labor, Bureau of Labor Statistics, Labor Force Statistics from the Current Population Survey, available at <http://data.bls.gov/PDQ/outside.jsp?survey=ln>.

but by the late 1940s, fewer than half of men and fewer than 10 per cent of women aged 65 and older were in the labor force (Fig. 20.1). In the post-war years, the participation rate for men aged 65 and older began a generally steady decline before leveling off in the mid- to late-1980s. The rate for women aged 65 and older fluctuated around 10 per cent until the early 1970s, at which time it, too, began to fall, reaching a low of 7.3 per cent in 1985.

A similar post-war pattern was evident among men aged 55–64, nearly 90 per cent of whom were in the labor force in 1948 (Fig. 20.2). By 1985, the participation rate for this group had fallen by more than 20 percentage points.

The labor force participation rate for women aged 55–64, on the other hand, skyrocketed, rising by nearly 18 percentage points between 1948 and 1985. By 1985, 42 per cent of women in this age group were working or looking for work.

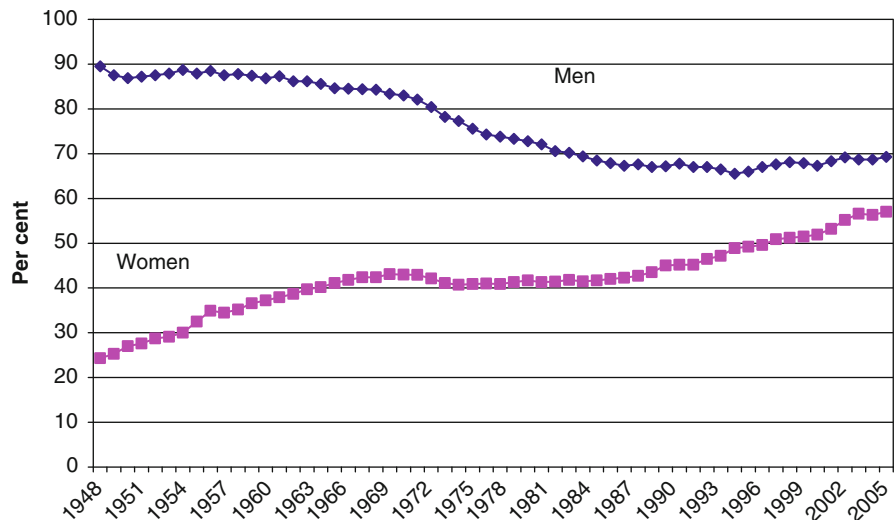


Fig. 20.2 Labor force participation rates for men and women aged 55–64, 1948–2005

Source: U.S. Department of Labor, Bureau of Labor Statistics, Labor Force Statistics from the Current Population Survey, available at <http://data.bls.gov/PDQ/outside.jsp?survey=ln>.

The Post-1985 Labor Force

From 1985 to 2005, attachment to the labor force continued to increase among women aged 55–64 (Fig. 20.2). The rate for even older women also began to rise somewhat after the mid-1980s (Fig. 20.1). Significantly, older men's labor force attachment started to change as well for reasons that are not entirely clear (Johnson 2002; Mermin et al. 2006). With some dips along the way, the participation rate for men aged 65 and older rose by 4 percentage points – from 15.8 per cent to 19.8 per cent – between 1985 and 2005. The rate for men aged 55–64, however, was only 1.4 percentage points higher in 2005 than it was in 1985 – 69.3 per cent versus 67.9 per cent.

As a result of these developments, the male-female gap in participation at upper ages has narrowed considerably. In 1948, men aged 65 and older were more than 5 times as likely as women in the same age group to be in the labor force; by 2005, they were only 1.7 times as likely. Among 55–64 year-olds, the narrowing of the differential was also substantial – going from 3.7 times as likely to 1.2 times. The aged 55 and older labor force was only 20 per cent female in 1948; by 2005, women's share of that older workforce had more than doubled to 46 per cent. In view of the heavy caregiving responsibilities of women in middle and old age and the work adjustments that caregivers report having to make to juggle the demands of paid work and family (National Alliance for Caregiving and AARP 2004), the feminization of the older workforce has implications for worker performance and productivity and is likely to put further pressure on employers for flexible work schedules and benefits.

Similar labor force trends have been evident in other developed nations, which typically experienced sharp declines in the participation rates of men aged 55 and older in the post-war years, although more recent reversals are evident in many countries. Marked increases in the participation of older women, at least those under the age of 65, have also been common.

Overall labor force participation rates for men and women aged 55–64 and 65-plus obscure significant changes within those groups, particularly among what might be thought of as the retirement-age population, i.e., that eligible for pension benefits.

Until recently, the so-called “normal retirement age” (NRA), or age of eligibility for full Social Security benefits in the United States, was 65; 65 is also the normal retirement age for many private defined benefit pension plans. Social Security retired-worker benefits first became available to women at age 62 in 1956 and to men at 62 in 1961. It did not take long for that age to become the modal age of benefit award (Table 20.1), even though early benefits are actuarially reduced. In recent years, about half of the awards to men and 60 per cent of those to women have gone to 62-year-olds.

Although only a minority of workers wait until age 65 or later to collect Social Security benefits, labor force participation rates for persons around that age have increased sharply since the mid-1980s (Table 20.2). The increase has been especially striking among women aged 65–69 (76 per cent between 1985 and 2005). The per cent increase for men in the same age group, while still sizable (38 per cent), has been only half that for women. Once again, these developments are not unique to the United States. Other developed countries are also witnessing increased participation rates in an age group (65–69) conventionally considered retired, although the rates are generally far lower than in the United States and increases have occurred somewhat later than in the United States (Table 20.3). Japan is an interesting exception. The participation rate for men aged 65–69 in Japan, although above that for their American counterparts, has fallen sharply since 1985, despite far greater efforts on the part of the government in Japan to promote the employment of older workers.

In the United States, labor force participation has also risen among workers eligible for early Social Security benefits, those aged 62–64. Not only would it appear that the long slide in labor force participation rates at older ages has come to a halt but for some segments it seems to have reversed itself. Nonetheless, retirement spikes upward at ages 62 and 65; after age 63, only a minority remains in the workforce. In many European countries, hardly anyone works after the age of 65.

Why the Turnabout?

After examining the impact of a number of factors such as changes to private pensions and the decreased

Table 20.1 Per cent distribution of social security benefits awarded to retired workers by age and sex, 1955–2005

Sex and year	Per cent distribution by age					
	Total, all ages	62	63	64	65*	66 or older
Men						
1955						
1960	100.0	N/A	N/A	N/A	44.9	55.1
1965	100.0	16.6	10.6	6.4	27.4	39.1
1970	100.0	20.9	14.1	9.4	43.6	12.1
1975	100.0	29.2	16.0	10.2	36.2	8.4
1980	100.0	33.7	14.7	9.5	35.6	6.6
1985	100.0	52.2	9.4	13.3	20.9	4.1
1990	100.0	53.2	8.6	12.7	18.5	7.1
1995	100.0	55.8	8.3	11.9	17.9	6.1
2000**	100.0	47.0	6.9	10.6	22.9	12.6
2005**	100.0	54.5	8.5	10.2	22.3	4.5
Women						
1955	100.0	N/A	N/A	N/A	36.6	63.4
1960	100.0	27.4	13.3	8.2	17.6	33.4
1965	100.0	33.6	12.5	6.2	17.4	30.4
1970	100.0	37.9	15.1	7.6	27.2	12.2
1975	100.0	44.9	14.8	7.6	23.7	9.1
1980	100.0	49.8	12.5	7.1	24.0	6.6
1985	100.0	63.7	8.1	10.8	13.4	4.0
1990	100.0	61.3	7.9	10.7	13.9	6.1
1995	100.0	61.4	7.3	11.2	14.2	5.9
2000**	100.0	57.7	6.5	10.3	15.4	10.1
2005**	100.0	59.0	8.1	9.6	16.9	6.4

* Excludes disability conversions.

**Includes conversions from nondisabled widow(er)'s to higher retired-worker benefits.

Source: Social Security Administration, *Annual Statistical Supplement to the Social Security Bulletin*, 2006, Table 6.B5.

rate of labor force growth on older male participation rates, Johnson (2002) argued that the reason or reasons for the halt in the decline in labor force participation among older men in 1985 remain a “puzzle” and that until they are better understood, it cannot be assumed that participation rates will continue to go up. Nonetheless, that is what they seem to be doing. Blau and Goodstein (2007) concluded that the recent increase among older men can be explained by the

change in the educational distribution of the older population – today’s older Americans have had more years of schooling than their parents and grandparents had at the same age, and better educated individuals have higher labor force participation rates than their less educated peers. Johnson (2002), however, observed that educational attainment was increasing as participation rates were falling in the first decades after World War II. Copeland (2007) reported that

Table 20.2 Labor force participation rates for men and women, aged 62 and older, 1985, 1995, and 2005 (in percentages)

Year	62–64		65–69	
	Men	Women	Men	Women
1985	46.1	28.7	24.4	13.5
1995	45.0	32.5	27.0	17.5
2005	52.5	40.0	33.6	23.7
Per cent change, 1985–2005	13.9	39.4	37.7	75.6

Source: U.S. Department of Labor, Labor Force Statistics from the Current Population Survey, available at <http://data.bls.gov/PDQ/outside.jsp?survey=ln>.

Table 20.3 Labor force participation rates for men and women, aged 65–69, 1985, 1995 and 2005, selected countries (in percentages)

Sex/Year	Australia	Austria	Finland	Japan	Spain
Men					
1985	14.1	5.0	12.0	55.6	12.3
1995*	17.4	7.0	6.7	54.2	5.7
2005	23.1	9.0	8.6	46.7	6.9
Women					
1985	4.1	1.8	7.8	26.8	4.7
1995*	6.8	3.8	2.3	27.2	3.1
2005	11.2	3.7	5.3	24.0	2.8

*1998 for Australia; 1996 for Austria.

Source: International Labor Organization, Laborsta (labor force surveys), available at <http://laborsta.ilo.org/>.

although the best educated in the aged 55 and older population are most likely to be working full time, full year, the highest percentage point increase in full-time, full-year work since the mid-1980s has been among those without a high school diploma. As a result, there has been a narrowing of the gap in labor force participation by education level.

Other research suggests that the shift from “traditional” defined benefit (DB) pension plans to defined contribution (DC) plans – a development that has transferred investment risk from employers to workers – has contributed to rising participation rates at older ages. Employees who are fortunate enough to be covered by a private pension plan at work are increasingly likely to find themselves in defined contribution plans. Thirty-five per cent of active pension plan participants were in DC plans in 1980; by 2004, that figure had doubled to 70 per cent (Munnell and Perun 2006). Munnell and Perun have pointed out that 62 per cent of workers with pension coverage in 1983 had DB coverage only; by 2004, an almost identical percentage (63 per cent) had DC coverage only. The defined benefit plans for which employers bear the risks are now available to a minority of workers with pension coverage.

Defined benefit pensions discourage continued employment when additional years of work after a plan’s normal retirement age fail to result in benefit increases large enough to compensate for the years of benefit postponement. Defined contribution plans, on the other hand, are age-neutral with respect to retirement, enabling plan participants to continue working without penalty. Workers with insufficient accumulations in their DC plans may decide to postpone retirement to supplement

their retirement savings and many do, with DC participants retiring from one to two years later on average than workers in DB plans (Munnell et al. 2003; Friedberg and Webb 2005). Johnson (2002), however, observes that the rise in DC coverage began before 1985 – the year that the decline in labor force participation rates for older males in the United States began leveling off – and in his opinion is unlikely to explain the abrupt change in older male labor force participation rates that occurred that year. Still, it may help explain the more recent increases.

Other factors that may have contributed to rising participation rates include Social Security reforms, particularly the liberalization of the Social Security earnings test limiting what workers can earn and still collect Social Security, the eventual elimination of the earnings test for workers over the full retirement age and the increase in the delayed retirement credit paid to workers who postpone receipt of Social Security benefit beyond the full retirement age. Increased longevity and a decline in physically demanding work likely play a role as well. Of the factors he examined, Johnson (2002) concluded that changes to the work penalty seem to be the most plausible explanation for lower retirement rates at age 65 but he acknowledges that this is hard to prove statistically; moreover, to the extent that it does play a role, its impact is modest. Blau and Goodstein (2007) comment on the likely correlation between education and unobserved factors such as motivation that influence work preferences. Better educated workers also have access to more desirable jobs, whose appeal may reinforce work motivation. Whatever the explanation, participation rates as of 2005 were clearly rising for virtually all age groups in the population aged 55 and

older. Boomer women's continuing attachment to the labor force was playing a key role but boomers cannot take all the credit. Men and especially women older than the boomers were either pushing back the date of retirement or returning to work.

A Blurry Passage from Work to Retirement

Bridge Jobs

For many workers, the road to retirement conforms to the stereotype of an abrupt, total and permanent cessation of employment after a long career with a single employer – off to work one day, off to the golf course or some other leisure activity the next. However, this is apparently not the pattern for most workers with career jobs, according to Cahill et al. (2007), who noted that older workers “more often than not” move from career jobs to other jobs before full retirement. These transitional arrangements are commonly known as “bridge jobs”. Definitions of bridge employment vary but to these researchers it is either part-time work or work that lasts fewer than 10 years or both.

In an analysis of the 1992–2004 retirement patterns of workers who were aged 51–61 in the 1992 Health and Retirement Study, Cahill et al. calculated that 60 per cent of those who had had and left full-time career jobs since age 50 moved into bridge jobs. Bridge employment was found to be more common among younger and healthier workers, as well as among workers with a college education, without health insurance on the career job and with defined contribution pension plans or no coverage as opposed to defined benefit plans. These are workers who, being younger and healthier, are more attractive to employers and so face rosier prospects as potential bridge workers than do older, less healthy workers or those who, lacking health insurance, pension coverage, or traditional pensions, find it necessary to work later in life.

Cahill et al. reported a U-shaped pattern of bridge employment by wage distribution: workers at the low and high wage ends on their full-time jobs had higher rates of bridge employment than those in the middle,

indicating indeed two very different reasons for bridge employment – need versus desire to go on working.

Although it has generated considerable interest in recent years, bridge employment is not such a new phenomenon. Ruhm (1990) documented a substantial amount of it among heads of households in the Retirement History Study of men and unmarried women ages 58–63 in 1969 who were followed at two-year intervals through 1979. He found that although more than half had left their career jobs by age 60, relatively few – only one in nine – had retired. Career employment lasting until full retirement was actually the exception rather than the norm, Ruhm discovered. For almost all bridge workers, the transition involved a change in industry and/or occupation.

The incidence of bridge employment may come as a surprise to those who subscribe to the notion that most workers, after some job churning in their early years, eventually find a job that sees them through to a gold watch and retirement. Lifetime employment, however, is a myth, according to Paul Yakoboski (1998) of the Employee Benefit Research Institute (EBRI). As of 2006, only about one-fourth of workers aged 55 or older had been at their jobs for at least 20 years (U.S. Department of Labor 2006b), a figure that has been falling. Even in the late 1970s – a time, many believed, of paternalistic employers who took care of hard-working employees by retaining them as long as they wanted to stay – only about one-third of aged 55 or older workers had been in the same job for 20 or more years (Yakoboski 1998). In today's global economy, workers may feel less secure in their jobs than they once did but Yakoboski (1998: 3) insists that “we never did live in an idyllic world of lifetime jobs with near-total security”.

Job tenure has, in fact, declined for some groups of workers while participation rates for those groups have remained flat or risen. For example, for men aged 55–64, whose labor force participation rate fluctuated only slightly between the early 1980s and 2006, median job tenure in 2006 was 9.5 years, down from 10.5 in 1983 (U.S. Department of Labor 2006b). Women in that age group had median job tenure that was also below what it had been in 1983 (9.2 years in 2006 compared to 10 years), even as their labor force participation rates soared.

That job mobility is common in the middle-aged and older population is evident in Bureau of Labor Statistics (BLS) figures showing that in 2006, about

10 per cent of workers aged 55 and older had been at their jobs for less than a year, about 30 per cent for four or fewer years and half for nine or fewer years (U.S. Department of Labor 2008); differences by sex tended to be minor. Many of these shorter-tenure workers, especially those in their 60s, are voluntarily transitioning into retirement via bridge jobs, while others have made mid-career job changes, become reemployed after job loss, or, particularly in the case of women, reentered after a spell of caregiving.

Phased Retirement

Interest in part-time work increases with age, with many polls asserting that those who plan to work in retirement look forward to part-time work. Part-time work seems a clear preference (AARP 1998, 2004); very few older workers are employed part time because they cannot find full-time work. Despite considerable interest in part-time work and the fact that older workers are more likely than all but the youngest of their counterparts to work part time, full-time work in the aged 55 and older population has risen among both men and women in the United States (74 per cent to 78 per cent for men in nonagricultural industries from 1995 to 2006 and 57 per cent to 65 per cent for women. [U.S. Department of Labor, Bureau of Labor Statistics, 1996, 2006a]). Full-year work has increased as well (Copeland 2007).

Purcell (2006) reported that 69 per cent of working men 65–69 were employed full-time in 2006, up from 57 per cent in 1995. Among working women in that age group, however, full-time employment rose from 43 per cent to 53 per cent over the same period; full-time work has even increased among those aged 70 and older.

Many older workers indicate that more attractive work options such as phased retirement would keep them in the workforce longer (Brown 2005) and many policy analysts and older worker advocates also believe that phased retirement opportunities would prolong working life. However, formal phased retirement remains rare in the United States and it is not clear how many workers are discouraged from continued employment because they were not able or never tried to arrange a reduction in work hours with their employers.

According to Hutchens (2003), who studied the phased retirement policies of 950 firms with 20 or more employees that hired older workers, nearly three-fourths of firms would permit some reduction of work hours before official retirement. Such arrangements are typically ad hoc rather than the result of formal policy. They are also more common in smaller firms, perhaps because small firms must often be more flexible. According to the National Study of Employers survey of workplaces with 50 or more employees, just over half of employers allow some employees to move from full-time to part-time work in the same position or level while just over one-fifth allow all to do so (Bond et al. 2005).

In Europe, it seems there is not much evidence of a shortening of work hours as people approach retirement (Romans 2007). There, too, phased retirement remains more the ideal than the reality, although there is considerable cross-country variation. Despite Europe's rapid population aging, phased retirement options remain the exception rather than the rule.

Once Out

The large majority of older Americans who are out of the labor force express little interest in being in it. Fewer than 3 per cent of persons aged 55 and older who are not in the labor force say they would like to be working now, a percentage that has remained stable at least since the mid-1990s (Rix 1996, 2006). One reason for this reluctance might be a dearth of attractive job opportunities. Haider and Loughran (2001) found that despite the fact that employed persons aged 65 and older were healthier, better educated and wealthier than their non-working age peers, they worked for relatively low wages. This led to speculation that they traded wages for flexibility. In other words, they may have been willing to accept the lower wages associated with many part-time jobs because those jobs gave them the flexibility they wanted. However, this is not to say that workers would not have appreciated higher wages along with the flexibility. Part-time work in the United States is often low wage, lacking in benefits and physically demanding. More appealing part-time opportunities might encourage more older workers to remain in the labor force after retirement age. Furthermore, because motivations for working change with age, as found in a survey by

the Metlife Mature Market Institute (2006), employers who wish to retain or recruit workers in their 60s will have to provide opportunities for socially engaging and meaningful work (DeLong 2006).

Research by Chan and Stevens (2007) indicates that over time, a not inconsequential percentage of full retirees do return to the workforce, although not necessarily out of choice. Were employment opportunities for older workers more flexible and attractive, the number of retirees interested in finding a job might be considerably higher.

Getting workers back into the labor force may be difficult because retirees tend to be satisfied with how their retirement has turned out (U.S. Department of Health and Human Services 2007). As important as work is to people, many find meaning and interest outside of the employment environment and look forward to retirement. In her history of retirement in the United States, Dora Costa (1998: 188) maintained that older workers today “enjoy the health and the income needed to pursue the good life” in retirement and, as economist James Schulz (1988) has noted, adjust quickly and well to retirement.

Hamermesh (2005: 1) argues that the labor supply of older workers is rather “inelastic with respect to wage increases” and that fostering their employment might require structuring work opportunities that conform with older Americans’ desires for unconstrained free time. Market work, he suggests, gets in the way of doing things older Americans would rather be doing. Costa has also expressed reservations about the enthusiasm on the part of older persons for prolonging their worklives. Given that few fully retired workers are eager to return to work (U.S. General Accounting Office 2001), efforts to keep them in the labor force may have a better payoff than trying to get them back in. Some workers, however, do not find retirement satisfactory; a perceived diminution in status may be particularly troubling. The eminent physician and gerontologist Robert N. Butler has written “When I stepped down as the chair of geriatrics at Mount Sinai to build the Longevity Center, people began referring to me as ‘retired’. I quickly realized that ‘retired’ was not a good word... [It] seems to be a synonym for ‘over the hill’” (quoted in Dreifus 2006). Boredom, a need or desire for more social interaction and financial need play roles as well.

Although bridge jobs function as a transition from career employment to retirement, only a minority of

older persons still employed report having *retired* from a previous job – 15 per cent of workers ages 45–75 and ages 50–70 in separate surveys (AARP 2002, 2003; DeLong 2006). Chan and Stevens (2007), however, have taken a more expansive view of retirement reversals by examining the transition from complete or partial retirement to a “less retired state” as measured by self-reported status in the Health and Retirement Study from 1992 to 2004. Between survey waves, about one in eight retirees was found to “reverse retire.” However, over all waves of analysis, three in ten workers who had ever been partly retired at some point became “not retired,” while one in four workers who had been fully retired became not retired (7 per cent) or partly retired (19 per cent). These data suggest the need for caution in making conclusions about the permanence of the retirement decision.

According to Chan and Stevens (2007), older retirees are less likely than younger retirees to reverse retire. In addition, partial retirees are somewhat more likely to increase their work hours than full retirees are to resume working. There is undoubtedly some overlap here, e.g., the fully retired are more likely to be older than partial retirees. However, these findings also draw attention to another issue, namely that fully retired workers face barriers such as age discrimination and skills atrophy when attempting to find work. Partial retirees, in contrast, presumably continue to prove themselves to their employers or they would likely be let go. Thus they should have an easier time adding hours than a full retiree has in obtaining any.

Another approach to estimating the number or percentage of working retirees involves examining pension recipients who are still at work, as Purcell (2006) does, using data from the Current Population Survey. Relatively few men or women aged 55–64 received income from an employer pension or retirement savings account in 2005 (18 per cent and 12 per cent respectively [Table 20.4]). Of those who did, about two-fifths of men and just over one-third of women were employed. As would be expected, higher percentages of both men and women aged 65 and older received pension income (43 per cent and 29 per cent, respectively) but these older pension recipients were far less likely than those aged 55–64 to be employed. As a per cent of the total relevant age group, employed pension recipients were a small proportion in 2005, as they were in 1990.

Table 20.4 Employed recipients of employer pensions and retirement savings plans, 1990, 2000 and 2005

Age, sex, year	Total # (000s)	# of pension recipients (000s)	# of employed pension recipients (000s)	Pension recipients as per cent of total	Employed as per cent of pension recipients	Employed pension recipients as per cent of total
	1	2	3	2/1	3/2	3/1
55–64						
Men						
1990	10,152	2,368	879	23.3%	37.1%	8.7%
2000	11,249	2,124	797	18.9%	37.5%	7.1%
2005	14,865	2,709	1,081	18.2%	39.9%	7.3%
Women						
1990	11,182	1,479	392	13.2%	26.5%	3.5%
2000	12,532	1,475	488	11.8%	33.1%	3.9%
2005	16,104	1,959	675	12.2%	34.5%	4.2%
65+						
Men						
1990	12,547	6,178	643	49.2%	10.4%	5.1%
2000	14,179	6,099	721	43.0%	11.8%	5.1%
2005	15,185	6,539	771	43.1%	11.8%	5.1%
Women						
1990	17,538	4,962	345	28.3%	7.0%	2.0%
2000	18,799	5,426	436	28.9%	8.0%	2.3%
2005	20,320	5,901	457	29.0%	7.7%	2.2%

Source: Patrick Purcell, *Older Workers: Employment and Retirement Trends* (Washington, DC: Congressional Research Service, 2006), Tables 5 and 6.

The number and proportion of working pensioners might rise as a result of the Pension Protection Act (PPA) of 2006. Before this law went into effect, employers were barred from making in-service defined benefit pension distributions to workers younger than a plan's normal retirement age, which was typically 65. Employees who wanted to scale back their work hours and make up for any earnings losses by receiving income from their pensions generally had to retire and move to a new employer. The PPA permits employers to make pension payments to workers who remain on the job provided they are at least age 62.

Characteristics of Older Workers

In many respects, older workers are not all that different from prime-age workers, e.g., those aged 25–54. The large majority of workers in both age groups are wage and salary workers. However, self-employment is more common at older ages, in part because self-employed workers retire later than their

wage and salary counterparts (Quinn 1998). In addition, many workers move into self-employment at later ages; according to Karoly and Zissimopoulos (2004) about one-third of self-employed workers aged 50 or older became self-employed at or after age 50. Late life self-employment may be the result of the urge to do something new, to be one's own boss, or to parlay a hobby or entrepreneurial idea into a paying business, or it may be due to job loss or early retirement and the inability to find suitable wage or salary work.

Older workers can be found in virtually every industry, although they are understandably less likely to be found in more physically demanding work such as construction or manufacturing. Differences are most evident when looking at those 65 and above compared to the total workforce or prime-age workers. An exception is agriculture. There are relatively few persons aged 75 or older in the workforce but 10 per cent of those who are work in agriculture (Table 20.5), in contrast to fewer than 2 per cent of the total workforce. Service industries claim more than 40 per cent of workers of all ages. Overall, the service and trade industries employ about six in ten workers of all ages.

Table 20.5 Industry of employed workers by age, 2005 (in percentages)

Industry	Age					
	16+	25–54	55+	65–69	70–74	75+
Agriculture and related	1.6	1.3	3.0	4.7	7.1	9.9
Mining	0.4	0.5	0.4	0.1	0.4	0.6
Construction	7.9	8.5	5.6	5.1	4.6	3.8
Manufacturing	11.5	12.6	10.9	8.0	6.7	6.1
Wholesale trade	3.2	3.5	3.4	3.3	2.7	2.9
Retail trade	11.9	10.1	11.1	14.4	16.5	15.5
Transportation and utilities	5.2	5.6	5.5	4.6	4.4	3.5
Information	2.4	2.6	1.9	1.9	1.4	1.9
Financial activities	7.2	7.4	8.0	7.9	7.7	9.9
Services	44.1	42.9	44.9	46.1	45.3	42.2
Public administration	4.6	5.0	5.3	3.9	3.3	3.6
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: U.S. Department of Labor, unpublished data.

Occupation also shows relatively modest age changes (Table 20.6). Older workers, notably those 75 and above, are more likely than prime-age workers or the total workforce to be in management or related occupations, not a surprise given their greater maturity and experience. They are somewhat less likely to be professionals, which is perhaps a reflection of the enhanced educational attainment of younger cohorts. Occupations requiring physical dexterity or imposing physical demands have relatively fewer older workers.

For both industry and occupation, differences by sex are more pronounced than age differences, with older women far more likely than men to be office workers and in service industries.

Unemployment and Labor Force Exit

Just as labor force participation rates tend to be lower at older ages so, too, do unemployment rates (Fig. 20.3). Unemployment rates for older persons are generally lower than those for younger persons in other developed countries as well.

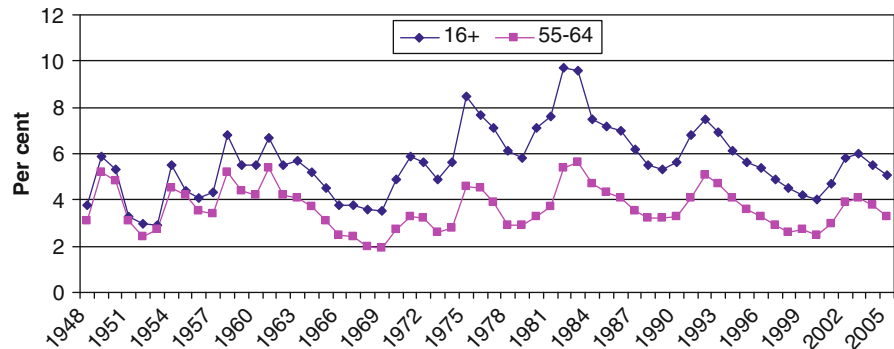
These lower unemployment rates paint a rosier picture about the employment prospects of older men and women than may be warranted. To qualify as “officially” unemployed, someone must be looking for work. Older workers, however, are more likely than their younger counterparts to forego or give up on the job search and instead withdraw from the labor force.

Table 20.6 Occupation of employed workers by age, 2005 (in percentages)

Occupation	Age					
	16+	25–54	55+	65–69	70–74	75+
Management, business, financial	14.4	15.5	18.4	18.5	18.5	21.5
Professional & related	20.3	22.0	21.2	18.4	17.2	18.2
Service	16.3	14.4	13.8	16.4	18.5	15.0
Sales & related	11.6	10.2	12.3	15.8	15.3	16.1
Office	13.8	13.3	14.1	13.2	13.2	13.0
Farming, fishing, forestry	0.7	0.6	0.6	0.7	0.5	0.6
Construction, extraction	6.5	6.9	3.9	3.2	3.2	2.6
Installation, maintenance, repair	3.7	4.0	3.3	2.6	1.7	2.3
Production	6.6	7.0	6.3	4.9	3.9	3.9
Transportation, material moving	6.1	6.0	6.2	6.4	8.0	6.8
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: U.S. Department of Labor, unpublished data.

Fig. 20.3 Unemployment rates, all persons 16+ and aged 55–64, 1948–2005



Source: U.S. Department of Labor, Bureau of Labor Statistics, Labor Force Statistics from the Current Population Survey, available at <http://data.bls.gov/PDQ/outside.jsp?survey=ln>.

Even if they might prefer to be working, if they are not looking for work they are not “unemployed”. For a high percentage of displaced older workers, withdrawal from the labor force occurs.

If they do remain in the labor force, older job losers spend substantially longer time looking for work than their younger counterparts and are more likely to experience earning losses upon reemployment (Couch 1998; Hipple 1999; Organization for Economic Cooperation and Development 2006). This may be due to discrimination (discussed below), a lack of marketable skills and/or an unwillingness to settle for the jobs that are available.

Older workers who leave the labor force because they believe they lack suitable qualifications for work or fear age discrimination may qualify as discouraged workers. Technically, these are men and women who would like a job and say that they are available for work but are not seeking employment because they do not believe that work is available, think they lack the necessary schooling or training, fear that employers will regard them as too old, or anticipate some other type of discrimination (U.S. Department of Labor 2006a). According to this definition, there are hardly any discouraged older Americans. Fewer than 3 per cent of persons aged 55 or older who were not in the labor force in 2006 admitted to wanting a job and only 7 per cent of those (or 68,000) met all the official criteria for jobseeking discouragement (U.S. Department of Labor 2007: Table 35). These percentages have remained fairly stable since the early 1990s.

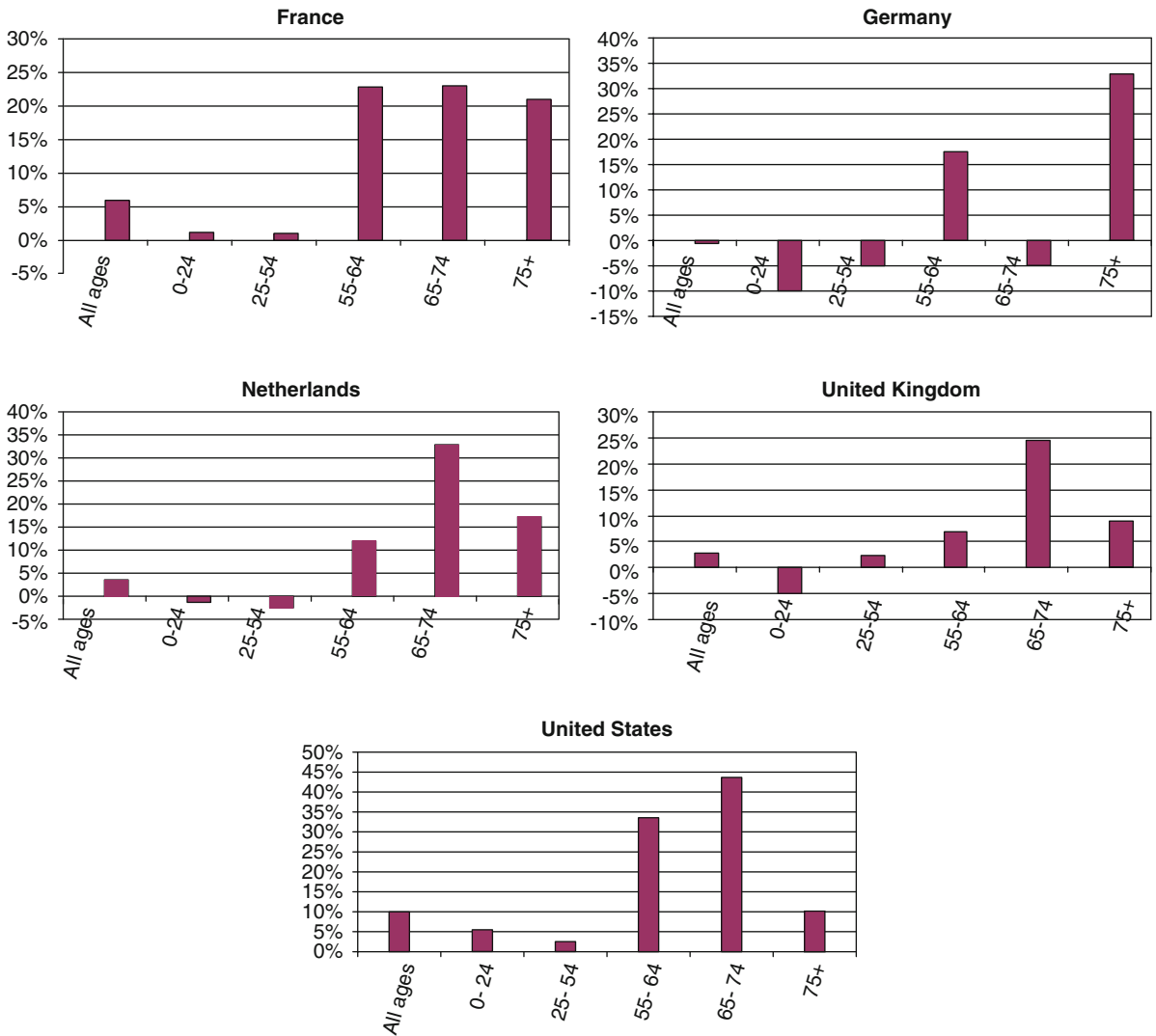
The definition of discouraged was less stringent prior to 1994 and the proportion of older workers who were classified as discouraged workers was higher as a result. Other research indicates that the number of older persons who would like to be working might be

substantially higher than that reported by the Bureau of Labor Statistics (see e.g., Commonwealth Fund 1990).

Even More Older Workers in the Future?

U.S. labor force growth has slowed since its peak in the 1970s and will continue to slow in the face of boomer retirements and a stabilization in women’s labor force participation rates (Toossi 2006). The labor force is projected to grow at an annual rate of 0.6 per cent between 2005 and 2050 (Toossi 2006), a decline from about 1.7 per cent for the previous 50 years (Organization for Economic Cooperation and Development 2005). In Germany, Japan and Italy the population aged 20–54 is already or soon will be declining; the same will likely occur in other European countries over the next decade (Organization for Economic Cooperation and Development 2006). Barring substantial productivity increases, real GDP growth in these countries is likely to fall, putting further pressure on governments to introduce measures to encourage work or discourage retirement. Such slowing may also cause employers to turn to older workers in increasing numbers, since the 55 and older segment of the population is the one whose numbers are expected to increase most dramatically over the short run (Fig. 20.4) and whose share of the workforce is growing.

As a result of slower growth in the labor force in recent years and the aging of the boomers, the U.S. workforce is aging, as is evident in the per cent of workers and jobseekers aged 55 or older. Having hit a low of 11.6 per cent in 1993, this segment of the



Source: U.S. Census Bureau, International Data Base, available at <http://www.census.gov/ipc/www/idb/tables.html>.

Fig. 20.4 Projected per cent change in size of age group, selected countries. 2005–2015

workforce rose steadily and had reached 16.8 per cent by 2006 (Fig. 20.5). The Bureau of Labor Statistics (BLS) projects that nearly 23 per cent of the labor force will be at least age 55 in 2016 (Toossi 2007).

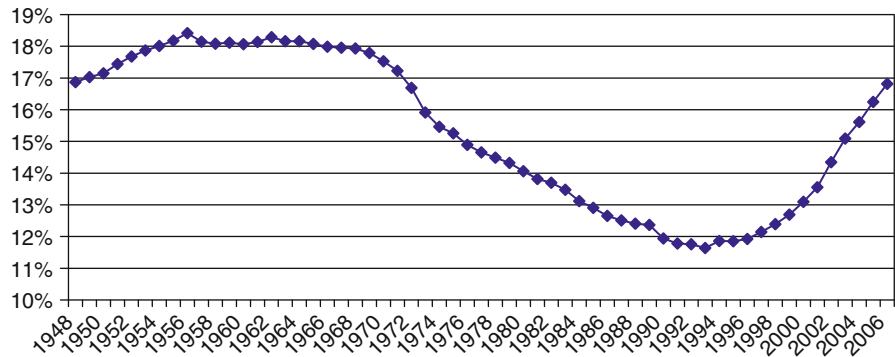
Official projections of the U.S. labor force ten years into the future are produced every two years by the Bureau of Labor Statistics. From 2006 to 2016, labor force participation rates are projected to rise to 66.7 per cent for persons aged 55–64 and to 29.5 per cent for those 65–74, with greater projected increases for women (Table 20.7). Only a small minority of men and women remain in the labor force into their late 70s and

beyond and that, as can be seen in Table 20.7, is not expected to change. Nonetheless, the projected per cent increase in participation for the population aged 75 and older is dramatic – from 6.4 per cent in 2006 to 10.5 per cent in 2016, an annual growth rate of 5.1 per cent.

Work Expectations

BLS’s projections could fall short of the mark if people act on their professed expectations to work

Fig. 20.5 Aged 55+ labor force as a per cent of the total labor force 16+, 1948–2006



Source: U.S. Department of Labor, Bureau of Labor Statistics, Labor Force Statistics from the Current Population Survey, available at <http://data.bls.gov/PDQ/outside.jsp?survey=ln>.

in retirement. Using the Health and Retirement Study, Mermin et al. (2006) explored the retirement expectations of boomers ages 51–56 in 2004, comparing them to workers of the same age in 1992. They reported significant increases in the mean expected probability of working full time past age 62 (from 47 per cent in 1992 to nearly 51 per cent in 2004) and past 65 (approximately 27 per cent to 33 per cent over the same period). The Retirement Confidence Survey similarly found an increase in the expected retirement age from a mean of 62–65 between 1996 and 2006 (Helman et al. 2006). A comparable increase among boomers occurred between 1998 and 2003 (AARP 2003).

Public opinion polls reveal high percentages of workers who plan on working in retirement. Although the wording of the questions as well as the sampled age groups vary across surveys, the results tend to be remarkably consistent: typically, some 70 per cent or more of workers contend that they expect to work in retirement (Fig. 20.6). Depending on when the “working retirement” begins and how long it lasts, actual participation rates in the 55 and older population could be substantially higher than officially projected.

Despite the consistency of findings on retirement work expectations, public opinion polls do little probing into the nature of the expectations and what they entail, so it is not clear just what workers have in mind when they say they expect to work in retirement. Those who are years from retirement likely have little idea of what they will be doing far into the future. Even workers on the threshold of retirement may harbor unrealistic expectations about what they will end up doing in light of the barriers many also anticipate facing; these barriers include ill health, age discrimination and a lack of resources to start a business, i.e., do something new (AARP 2003).

Furthermore, retirement still tempts (see, e.g., Costa 1998). Despite the fact that eight in ten boomers expect to work in retirement, more than four in ten “cannot wait” to retire (AARP 2004), often at an early age. When asked specifically about a desirable retirement age in a 1998 survey, boomers wanted to stop working for pay at an average age of 59.7 (AARP 1998, unpublished data). Ideally, then, the “working retirement” would seem to be an early retirement.

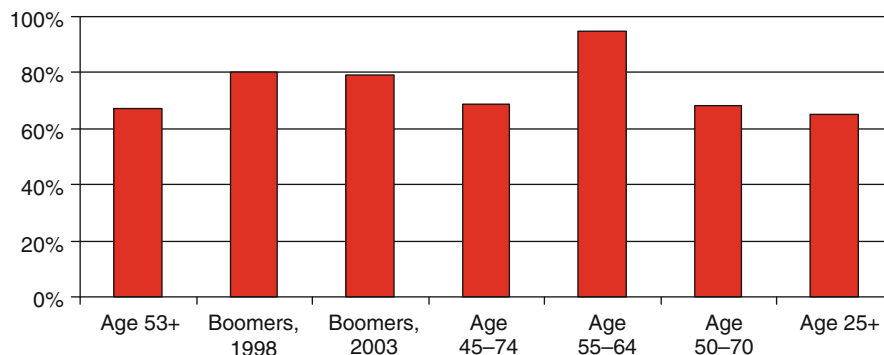
A comfortable and dignified retirement was one of the great success stories of the second half of the

Table 20.7 Labor force participation rates for persons aged 55 and older, 2006 and projected 2016 (in percentages)

Age	Both sexes			Men			Women		
	2006	2016	Per cent Change	2006	2016	Per cent Change	2006	2016	Per cent Change
55–64	63.7	66.7	4.7	69.6	70.1	0.7	58.2	63.5	9.1
65–74	23.6	29.5	25.0	28.8	34.6	20.1	19.2	25.1	30.7
75+	6.4	10.5	64.1	9.5	14.7	54.7	4.4	7.6	72.7

Source: M. Toossi, “Labor Force Projections to 2016: More Workers in Their Golden Years,” *Monthly Labor Review*, November 2007, Table 3.

Fig. 20.6 Per cent of workers planning to work in retirement, selected surveys*



*Wording varies across surveys.

Source: AARP, *Boomers Look Toward Retirements* (Washington, DC: AARP, 1998); AARP, *Staying Ahead of the Curve: The AARP Work and Career Study* (Washington, DC: AARP, 2002); AARP, *Staying Ahead of the Curve 2003: The AARP Working in Retirement Study* (Washington, DC: AARP, 2003); AARP, *Baby Boomers Envision Retirement II* (Washington, DC: AARP, 2004); Humphrey Taylor, "The New Vision of Retirement Is Very Different than the Traditional Image of Retirement," *The Harris Poll #23*, May 15, 2002, available at http://www.harrisinteractive.com/harris_poll/printerfriend/index.asp?PID=301; Ruth Helman, Mathew Greenwald & Associates, Jack VanDerhei, and Craig Copeland, "The Retirement System in Transition: The 2007 Retirement Confidence Survey," *EBRI Issue Brief No. 304* (Washington, DC: Employee Benefit Research Institute, 2007).

20th century in much of the developed world. Prior to the advent of social insurance and private or occupational pensions, few older workers had the resources to retire. Those who lacked retirement income worked as long as they were physically able or could keep their jobs. Social Security, private pensions and increased wealth made it possible for growing numbers of older Americans to leave what was often arduous employment and expanded leisure activities gave them something to look forward to in an increasingly early retirement. Retirements lasting 25 years or more have been common.

The United States was by no means alone in this. Very generous early retirement provisions in public pension schemes in much of Western Europe fostered very young effective retirement ages. Although it was written about the United States, Dora Costa's observation about work and retirement applies to other countries as well: rising incomes have made retirement more affordable; technological developments have lowered the cost of recreational activities and the variety of recreational activities has expanded, making leisure "more attractive" (Costa 1998: 155). Retirement became appealing in part because there was more to do outside of work and retirees did not have to be wealthy to do it. As many countries are finding, raising the pensionable age tends not to be popular.

Why Work?

A number of developments raise questions about whether today's older workers, particularly the baby boomers, will be able to retire at the young ages workers have been retiring in recent decades. Many experts on old-age economic security contend that that luxury will not be available to the boomers and those who follow them (Munnell and Perun 2006; Munnell et al. 2006; Organization for Economic Cooperation and Development 2006; Penner and Johnson 2006). They point, for example, to stagnating pension coverage – only about half of the U.S. workforce is covered by a private pension plan at work (Munnell et al. 2002), a figure that has changed little since the 1970s. In addition, inadequate savings, the rise in the age of eligibility for full Social Security benefits and cuts in retiree health benefits are also likely to foster longer worklives. Perhaps one in four boomers will not retire because they will not be able to afford to, according to the Center for Retirement Research at Boston College (Munnell et al. 2006).

People plan to work in retirement for a variety of reasons – they want to remain active, they want to make a contribution, they enjoy what they are doing and, of course, they need the money or, in the United States, the access to health care that work provides (AARP 2002,

2003). When pressed for the single most important factor in the decision to work in retirement, financial reasons rise to the top of the list among both those who say they plan to work in retirement and those who are actually working in retirement (AARP 2003).

The U.S. Congressional Budget Office (2004a) estimates that about one-fourth of boomer households have yet to accumulate significant retirement savings. Helman et al. (2006) likewise found that workers are not putting aside much money for retirement; three-fourths of respondents in the 2006 Retirement Confidence Survey had less than \$10,000 in retirement savings. Older workers have had more time to save but even workers in their 50s had a median of only \$60,000 in 401(k) assets in 2004, including IRAs (Munnell et al. 2006). Continued employment is obviously one way to deal with a retirement financial shortfall. Consequently, the number continuing to work for financial reasons could well rise, increasing labor force participation rates beyond those projected. That financial factors have interfered with retirement plans became clear in the early 2000s, when workers began indicating that portfolio reversals were causing them to push back the date of retirement (Brown 2002).

Mermin et al. (2006) hypothesized that older workers would be more likely to expect to remain employed as the benefits of working and the costs of retiring increased and found that generally to be the case. Associated with increased work expectations were self-employment, higher education and higher earnings. Defined benefit pension plan coverage, access to employer-sponsored retiree health benefits and greater household wealth – all of which make retirement more feasible economically – were linked to lower work expectations.

Will most of those who expect to work actually act on those expectations? Although not everyone is in accord about what has prompted workers to increase their labor force participation rates, Mermin et al. (2006) contended that the factors that account for much of the increase in expected probabilities of working longer are likely to continue. These factors include further cuts in or greater cost-sharing for retiree health benefits and the shift away from DB pension plans.

Working longer pays off as far as eventual retirement income security is concerned. Continuing to earn and postponing collecting Social Security benefits until age 70 nearly doubles the age-62 benefit (U.S. Congress 2004b). An eight-year delay in collecting Social Security might be more than most

workers are willing or able to tolerate but many of them might do so if they were more fully aware of the costs and benefits of their retirement-age decision. Moreover, even fewer additional years at work pay off in retirement.

Butrica et al. (2004) estimated that retiring at age 67 rather than at age 62 could increase annual consumption of U.S. retirees by more than 25 per cent. They also found that even a single additional year at work significantly increases retirement wealth. Computations by Munnell et al. (2006) suggest that two to three and a half more years of work, depending on the assets people hold, should be enough to duplicate current earnings replacement rates into the future.

Longer worklives mean more years to save and for investments to grow and fewer years to spend the accumulations. They also have a positive impact on the finances of the Social Security system, as well as tax revenues in general. An extra five years of work would offset more than half of the Social Security shortfall projected for 2045, writes the Urban Institute (2006).

Although there are many reasons workers may postpone retirement and perhaps should be encouraged to do so, there are, as of this writing, reasons that may discourage workers from remaining longer in the workforce, including the high implicit tax rate on work (Butrica et al. 2004). DeLong (2006) points to organization cultures that foster premature departure, limited employment opportunities, employer concerns about the costs of older workers, changing work motivations and a dearth of flexible work options that may make it difficult to keep older persons at work. These barriers are common in other developed countries as well as in the United States. Furthermore workers can often receive almost as much income in retirement at age 65 as they can by remaining employed (Butrica et al. 2004), which is hardly an incentive to keep working. For some fortunate workers, early retirement benefits from Social Security and/or pensions provide almost as much (or in some cases more) after-tax income in retirement (Johnson et al. 2006).

Will Workers be Able to Work Longer?

Many workers leave the labor force before they planned to or are ready to do so. An estimated four million boomers – the oldest only 57 – had left the labor force

as of 2004, most commonly because of disability (U.S. Congress 2004c). In recent years, about 40 per cent of retirees have reported retiring earlier than planned, primarily for reasons over which they have little control – health problems, disability, or company restructuring (Yakoboski and Dickemper 1997; Helman et al. 2006, 2007; Rotenberg 2006). Workers are, in fact, “more than twice as likely to expect to work for pay in retirement (67 per cent) as retirees are to have actually worked (27 per cent),” according to the Employee Benefit Research Institute (Helman et al. 2006: 4). The Pew Research Center (2006) similarly reports that while the average worker plans to retire at age 61, the average retiree did so at the young age of 57.8.

Although the popular press touts age 60 as the new 40, employer stereotypes about the impact of advancing age on performance and productivity may not be quite as positive. The available research on age and productivity indicates that age is a poor predictor of performance (e.g., Sterns and McDaniel 1994). Although such evidence as exists may indicate that many differences between older and younger workers are relatively minor (Neumark 2001), “negative stereotypes about older workers and classifications based on them seem likely to act – at least sometimes – in an arbitrary fashion, harming many productive older workers” (Neumark 2001: 19).

The impact of aging on work ability was featured prominently in the work of a panel convened by the National Research Council (NRC) and the Institute of Medicine (IOM) of the National Academies to study the health and safety needs of older workers (Wegman and McGee 2004). The panel stressed the dearth of research on age and job performance, calling that which has been done “inconclusive” (Wegman and McGee 2004: 3). Furthermore, the research on age and performance suffers from a number of limitations, including a paucity of studies with substantial numbers of older workers, especially those aged 65 and above.

Selective attrition affects research findings in longitudinal studies that otherwise shed light on how performance may change over time. Selective attrition refers to the tendency of some individuals to drop out of research studies more readily than others (Wegman and McGee 2004). As it turns out, the more capable subjects tend to be the survivors, yielding research findings that might not hold up or remain as strong with more representative samples. Individuals with

health problems or declining abilities also tend to exit the labor force earlier than their healthier or more capable age peers, producing a “healthy worker effect,” or a workforce that is healthier than the older population as a whole. This raises the question of what impact (if any) a sizable increase in the number of older persons in the workforce – if they are there because they cannot afford to retire – would have on conclusions about age and performance.

Age-related health problems and disability are major reasons older workers exit the labor force (Uccello 1998), although disability rates at upper ages have declined (e.g., Manton and Gu 2001) and it is widely assumed that the health status of older workers has improved along with increases in life expectancy. Older persons in the United States are somewhat less likely to report only fair or poor health than in the past – a decline of more than 2 percentage points for the 55-plus population between 1991 and 2004 (National Center for Health Statistics 2006). Yet how much healthier today’s cohorts of older persons are, given for instance, the sharp rise in obesity and diabetes, is an open question.

Munnell and Libby (2007) maintain that older persons appear to be at least as healthy as they were 40 years ago, while Soldo et al. (2006) suggest that boomers the approaching retirement may actually be less healthy than the recent cohorts that have preceded them. On a positive note, Weir (2007) emphasizes that adverse health conditions are being managed; improvements (e.g., a decline in smoking) should be kept in mind as well. Most boomers, he contends, could work several years longer, even if they are not healthier than previous cohorts of older workers. Steuerle et al. (1999: 2) argue that “a strong case that many people leave the workforce long before their health makes it necessary”.

Changes in cognitive functioning also occur with age. The NRC/IOM report points out large negative age-related effects on various measures of cognitive functioning (Wegman and McGee 2004). Although the literature indicates some increase up to about age 50 in measures of knowledge of word meaning and general information, it also appears that memory, reasoning and special abilities measures decline from the 20s on. However, the report cites little evidence of an impact of cognitive changes on performance among workers remaining on the job. Those with cognitive impairments may have left the labor force either voluntarily or

involuntarily, with remaining workers able to perform in a satisfactory manner. Also, as might be expected, crystallized intelligence or cognition – or accumulated knowledge – does appear to increase with age, at least until 50 and perhaps later, likely enabling older workers to capitalize on past experience and knowledge to deal with workplace problems.

Employer Attitudes Toward Older Workers

Whether older workers remain on the job or are hired depends on more than just an interest in doing so and the ability to do the work. Employers must want and need those workers. Employer attitudes toward older workers influence decisions to hire or retain them. Over the years, employers have exhibited consistently positive attitudes toward the older worker population when it comes to a number of hard-to-quantify but performance-relevant attributes such as loyalty, dependability, experience, maturity and judgment (AARP 1995, 2000, 2005; Barth et al. 1993). However, they often express reservations about older workers' technological competence and ability to learn new technologies. A recent analysis of the attitudes of a nationally representative sample of 400 employers has led Eschtruth et al. (2007) to conclude that employers are "luke-warm" about older workers.

Cost concerns often emerge in examinations of the pros and cons of older workers. Health care costs are higher for older workers. In addition, Johnson et al. (2006) observed that defined benefit plans increase the cost of hiring older workers because the value of expected lifetime benefits typically rises with age. The Johnson et al. calculations showed that a worker hired at age 35 would accumulate lifetime pension benefits amounting to 10 per cent of earnings during the first five years of employment. A worker hired at 55, in contrast, would see an accumulation of 21 per cent over the same period, a difference too large to be offset by wage differences the investigators maintain.

Furthermore, health coverage for workers is a costly benefit and employers who offer it must provide their insurance as the primary payer, even if a worker is Medicare eligible. These specific cost considerations may not be an issue in other developed countries but

they likely influence employers' hiring decisions in the United States. The shift to DC plans presumably diminishes but does not eliminate the significance of one potential hiring or retention impediment. A DC plan in which employers contribute a portion of salary will cost more for higher-wage workers, who are often the older workers in a firm.

Presumably, older workers bring to the workplace something of value, e.g., the loyalty, dependability and experience noted above. These less tangible attributes, however, are difficult to quantify and employers apparently do not try to. Research from the early 1990s found that investment in older workers can pay off in terms of longer tenure and, in one case study, more hotel reservations than made by younger workers (Commonwealth Fund 1991); however, studies that attempt to quantify and attach a bottom-line value to older workers are rare (ICF Incorporated 1995). Towers Perrin (2005) has calculated that employee engagement and other hard-to-measure attributes can offset some of the higher costs of older workers. In addition, employers have been scaling back on various costly benefits such as retiree health coverage. Nonetheless, many employers are likely in agreement with noted economist Alicia Munnell, who bluntly stated that "...older workers are expensive. They are paid more, sometimes in excess of their greater productivity" (Munnell 2006: 24). To the extent that this accords with employer attitudes or experience, employment opportunities for older workers are undermined. Some analysts argue that even if older workers are as productive as younger workers, the fact that they are typically paid more means that per hour compensation is greater for the same output.

Such cost matters have led to suggestions that salary adjustments for older workers might be in order, i.e., that consideration should be given to reducing the wages of older workers in light of presumably waning productivity. Wage reduction, this argument goes, could lead to greater labor force participation rates (see, e.g., Rebick 1993). Japan deals with the higher wage/salary issues in a variety of ways, including mandatory retirement and the frequent rehiring of older workers at lower retirement wages. Lower-wage rehiring (minus the mandatory retirement) undoubtedly occurs in the United States, where the rehiring of retirees is common, although some forms of it could violate the Age Discrimination in Employment Act and the Employee Retirement Income Security Act.

The Changing Nature of Work

As the nation shifted from manufacturing to a service and knowledge-based economy, the physical demands of work declined sharply. Steuerle et al. (1999) estimated that the share of workers in physically demanding jobs – defined as requiring frequent lifting or carrying objects weighing more than 25 pounds – fell from 20 per cent in 1950 to 7.5 per cent in 1996; moreover, the drop was most “dramatic” for older workers. There can be little doubt that the jobs of older workers in developed nations are not the backbreaking work of a century or even a half century ago. Nonetheless, many of those jobs are, or are perceived as, physically demanding. In 2002, about 30 per cent of 55- to 79-year-old workers said that their jobs involved “lots of physical effort” and 14 per cent reported having jobs requiring lifting heavy loads (U.S. Department of Health and Human Services 2007). Many older workers in the Health and Retirement Study also noted that their job required more difficult things than it used to (over 40 per cent of workers aged 55–64) and about six in 10 in this age group had a job involving a lot of stress. With age, however, these percentages tend to fall. A reduction in work hours, common among older workers, may contribute to this decline.

In general, then, the overall quality of work has improved. Johnson et al. (2007) have examined the job demands workers face today and how they have changed over time by linking information on occupational characteristics from the Occupational Information Network (O*NET) to the March 1971 and March 2006 Current Population Surveys. Not only are jobs less physically demanding, they are less likely to entail difficult working conditions. At the same time, however, jobs have become more cognitively challenging; this study, too, cites more stressful jobs.

In the Fourth European Working Conditions Survey, workers in 31 European countries were queried about exposure to various physical risks at work (European Foundation for the Improvement of Living and Working Conditions 2007a). Workers aged 55 or older were less likely than younger workers, especially those under age 25, to report exposure to negative physical work factors or risks, among which were loud noises, high temperatures, smoke, fumes, or vapors and carrying or moving heavy loads. Nonetheless, substantial percentages noted having to cope with such risks as

standing or walking (72.5 per cent), repetitive hand or arm movements (59.1 per cent), or tiring or painful positions (44.8 per cent). Not surprisingly, increased exposure to physical risks at work was found to have the most significant impact on workers’ willingness and perceived ability to do their current job at age 60.

Looking ahead, Johnson et al. (2007) conclude that (for the United States) the prevalence of job demands will not change much in coming decades if the occupational growth trends projected by the Bureau of Labor Statistics continue through 2041 and if the job demands of particular occupations remain constant. To the extent that older workers are performing effectively in jobs today, there should be little problem over the next few decades. Marshall (2001) emphasized that most jobs do not require working to full capacity and that workers compensate for declining capabilities.

The National Research Council and Institute of Medicine warn, however, of the consequences of work-related stress, which may have an adverse impact on worker satisfaction and productivity (Wegman and McGee 2004) and may affect the willingness and ability to continue working. Surveys of workers and work across the European Union (EU) find that working conditions have in some respects deteriorated in recent years due in part to the intensification of work, which leads to greater stress (European Foundation for the Improvement of Living and Working Conditions 2000, 2007a). Work intensification is believed by some to be a disincentive to continued employment, particularly at upper ages.

Despite problems with some jobs, most older Americans nonetheless “really enjoy going to work” – 88 per cent at ages 55–59 and 98 per cent of those 75–79 (U.S. Department of Health and Human Services 2007). Older European workers are also generally satisfied with work, according to the European Foundation for the Improvement of Living and Working Conditions (2007b). Of course, the less satisfied had most likely left the labor force if they could afford to do so.

The Demand for Labor

The extent to which workers manage to meet their retirement work expectations will depend in large part on employers’ demand for workers. Labor and skills shortages are already widespread in some

industries and employers are turning to older workers to fill some of the slots. For example, in the health care industry, where shortages are acute, U.S. hospitals and other health care facilities have begun to focus on the retention and hiring of older workers. They may offer incentives to remain at or return to work and/or introduce workplace modifications that lessen the physical demands of jobs and make prolonged worklives more feasible. To the extent that other industries or sectors face such shortages, comparable responses are likely.

However, although many experts anticipate that slowing labor force growth and the retirements of the boomers will result in labor shortages that could fuel interest in the hiring and retention of older workers (see, e.g., Judy 1999; Watson Wyatt Worldwide 2002), not all experts are in agreement. Cappelli (2003, 2004) postulated that shortages are unlikely, in part because the increasing labor force participation of older workers will help alleviate any. Should shortages materialize, he pointed out, wages would rise, attracting more retirees back into the workforce (which would also have an ameliorative effect on the shortages). Moreover, rising wages might keep more workers on the job.

On a less positive note, Blinder (2005) foresees a substantial increase in offshoring due to globalization and electronic communication. He contends that in the future, offshoring – little of which he says has occurred to date, although reliable data are lacking – will not be between things that can and cannot be put into a box (e.g., manufactured goods) but between services that can and cannot be delivered electronically. On the one hand, this development could involve the loss of a substantial number of the types of jobs aging workers might be attracted to. On the other hand, to the extent the economy sees a growing shift to “personal” services, which Blinder predicts, older workers could benefit, given the relevance of maturity, judgment and experience to many personal services jobs.

Age Discrimination: How Big a Problem?

Although Americans seem to feel that people become old at 70 or later (National Council on the Aging 2002), old age for workers in the United States technically begins at age 40 under the Age Discrimina-

tion in Employment Act (ADEA) of 1967. The ADEA was enacted three years after Title VII of the Civil Rights Act of 1964 barred discrimination based on race, color, religion, sex, or national origin. Congress had debated whether to include age under Title VII but opted not to out of concern that doing so would jeopardize the passage of Title VII. Instead, Congress ordered the Secretary of Labor to study the impact of age discrimination's on individuals and the economy and report back to Congress with recommendations (Bessey and Ananda 1991). The result was a report in 1965 that underscored the pervasiveness and impact of age discrimination in the United States and led to passage of the ADEA outlawing arbitrary age discrimination in employment (Age Discrimination in Employment Act, available at <http://www.eeoc.gov/policy/adea.html>).

Persons aged 40–65 were initially protected under the ADEA but over time, amendments extended the protections of the law. In 1986, mandatory retirement for most occupations was eliminated.

Time-limited exemptions from the mandatory retirement ban were granted for public safety workers and tenured faculty at colleges and universities. As it had done prior to the passage of the ADEA in 1967, Congress mandated additional research to assess the consequences of eliminating mandatory retirement for the two exempt groups. There was concern that eliminating the retirement age cap could adversely affect public safety as well as higher education institutions' ability to hire younger faculty and remove non-performing tenured professors. The report on public safety workers strongly endorsed allowing the exemption to expire, concluding that although the annual risk of sudden incapacitation due to a cardiac event increases sharply with age, it is still less than 0.2 per cent at age 60 (Pennsylvania State University 1992). A heart attack that suddenly incapacitated a public safety officer that posed a risk to the public or co-workers (i.e., that occurred during a critical job-related activity and was not mitigated by a coworker) was estimated to occur conservatively once every 25 years in a workforce of 500 public safety officers (Pennsylvania State University 1992). The National Academy of Sciences' study of the impact of removing mandatory retirement requirements on colleges and universities also concluded that the exemption should lapse but identified problems that could arise as a result and offered suggestions for dealing with those problems (Hammond

and Morgan 1991). In the end, the exemptions for both groups were allowed to expire; however, an exemption was reinstated for public safety workers in 1996.

In 2005, the Supreme Court ruled that ADEA claims can be based on disparate impact theory, which holds that workplace practices and policies that appear facially neutral can have a differential, or disparate, impact on certain classes of workers, in this case, older workers. Until this ruling, claimants had to prove disparate treatment or the intent to discriminate.

Although the ADEA covers all terms of employment, including hiring, discharge, compensation, promotions and training, it does not apply to firms with fewer than 20 workers. However, all 50 states have their own age discrimination laws, most of which apply to smaller firms. Other countries have also taken steps to ban some forms of discrimination against workers based on age. Australia and New Zealand have abolished mandatory retirement. In November 2000, the European Union enacted an equal treatment directive prohibiting direct or indirect employment discrimination based on religion or belief, disability, age, or sexual orientation. Member states had until December 2006 to enact legislation to implement the directive pertaining to age; mandatory retirement remains legal.

It is too early to assess the impact of the EU directive but the United States has had four decades of experience with federal age discrimination laws. Most U.S. workers should be safe from discriminatory employment actions based on age. And, indeed, more overt forms of age discrimination in employment have disappeared in the United States. Help-wanted ads that routinely set age limits no longer appear in the country's newspapers. Official mandatory retirement ages in companies have been eliminated. However, the United States is not yet bias-free when it comes to older workers and jobseekers.

Despite substantial evidence, including sizable court awards to victims, that older workers face age discrimination in their efforts to find or keep their jobs (Bendick et al. 1996, 1999; Lahey 2005), estimating the extent to which older workers are actually discriminated against is fraught with problems. Few employers will admit that they discriminate against older workers, even when age does influence their employment decisions, as it appears to do in at least some instances. A survey of 314 executive search firms and more than 1,000 executives, for example, found that only 8 per

cent of the search firms and 3 per cent of the executives felt that "age was never a significant factor in hiring decisions" (American Society of Association Executives 2000).

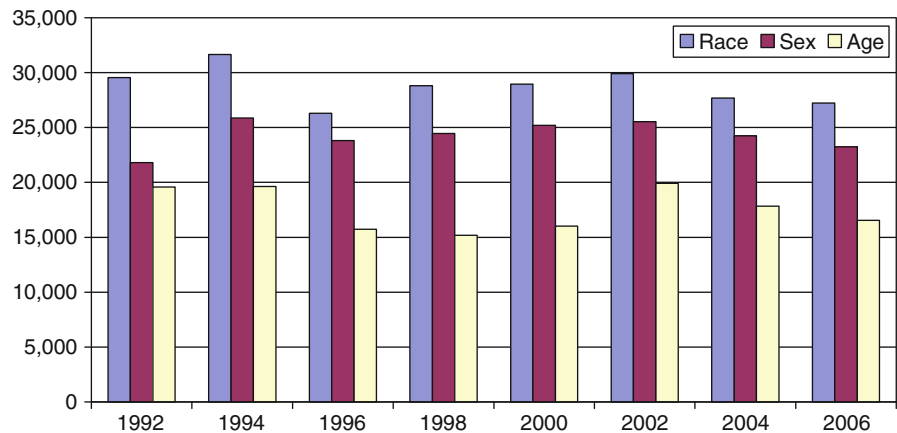
Age discrimination can be difficult to detect, especially when it comes to hiring decisions as the competition and their qualifications may be unknown. In many instances, workers themselves may be unaware that they have been passed over for another applicant, given a lower salary increase, or denied a promotion because of their age. Differential treatment based on age is generally easier to detect in termination cases, where the characteristics of the workers discharged, retained and perhaps hired are more readily compared. This helps explain why ADEA charges filed with the Equal Employment Opportunity Commission (EEOC), the federal agency with jurisdiction over the ADEA, claiming discrimination in terminations are more common than other charges (Neumark 2008).

The lack of hard data on the incidence of age discrimination in employment notwithstanding, workers have long believed that employers discriminate against employees at older ages. Eight out of ten workers in a 1978 Harris survey agreed that "most employers discriminate against older people and make it difficult for them to find work" (U.S. Congress 1979: 74). In 2002, more than two out of three workers aged 45–74 maintained that "workers face age discrimination in the workplace today"; six out of ten contended that older workers are the first to go when jobs are cut (AARP 2002: 66, 68). Only a minority, however, mentioned that age has been used against them in specific ways (e.g., with respect to hiring and terminations).

Despite the fact that the majority of older workers seem to see discrimination around them – and may even have experienced it themselves – they for the most part seem to believe that age has little impact on how they are treated at work. The large majority (77 per cent) of workers aged 45–74 in the 2002 survey said that age generally makes no difference in how their employers treat them, while a few (8 per cent) actually felt that they were treated better because of it (AARP 2002).

Workers who think that an employer, union or employment agency has used age in making an employment decision can file a charge with the EEOC or state fair employment practices offices. Filed charges are at best a measure of perceived age discrimination and the willingness to do something about

Fig. 20.7 Number of sex, race, and age charges filed with the EEOC, FY 1992–FY 2006



Source: Equal Employment Opportunity Commission, Enforcement Statistics, Charge Statistics FY 1992 Through FY 2006, available at <http://www.eeoc.gov/stats/charges.html>.

it. There are actually more people aged 40 or older in the labor force (53 per cent of the labor force) than there are women (46 per cent) or minorities (30 per cent) (U.S. Department of Labor 2007; Toossi 2005), but age charges are substantially less likely than sex or race charges to be filed with the EEOC (Fig. 20.7). Many workers who have or think they have been discriminated against because of their age never bother to file charges, although that is likely true for race and sex discrimination as well. The EEOC (2007) has consistently found no reasonable cause to assume discrimination has occurred in the majority of age charges filed with the agency; this was the case for about 60 per cent in Fiscal Year (FY) 2007. (Equal Employment Opportunity website, available at www.eeoc.gov/stats/).

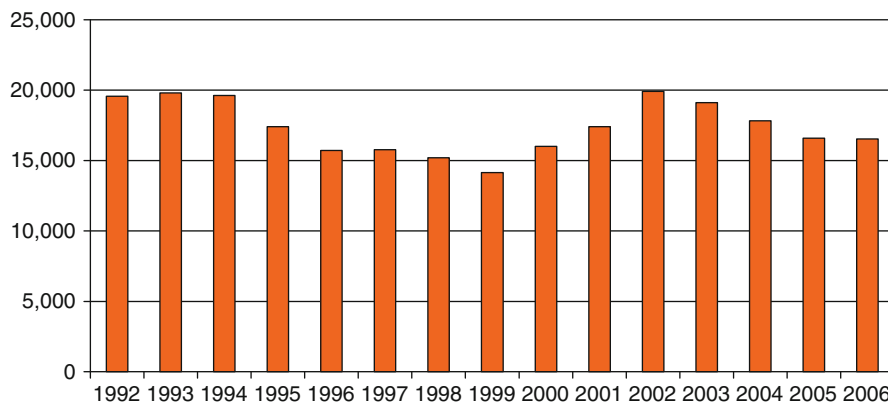
The number of charges filed with the EEOC increased fairly steadily through the early 1990s but the mid-to late-1990s, a time of very low unemployment, saw a decline. Employers facing a tight market may have found their alternatives limited and thus been more receptive to older workers and less likely to discriminate. Older jobseekers themselves may have been more optimistic about their employment prospects. A negative job outcome (e.g., failure to get hired) might still have been viewed as age discrimination but the buoyant economy might have made older workers more confident about finding a job and less inclined to bother with filing an age charge.

When the economy soured in 2000, the number of charges rose, peaking at just under 20,000 in FY 2002. After 2002, they resumed falling (Fig. 20.8).

Despite the fact that the majority of age charges filed with the EEOC are deemed to show no probable cause of discrimination, Adams and Neumark (2006) argued that the ADEA cases that do show it (about 4 per cent in FY 2006 indicate that age discrimination in employment remains a problem. So too do the court judgments and monetary settlements in age cases. Monetary benefits, excluding those obtained through litigation, amounted to nearly \$52 million in FY 2006 (www.eeoc.gov/stats/adea.html).

Testers have been used to document age discrimination in the workplace. In the 1990s, Bendick and colleagues sent applicants of different ages on job interviews and found that younger applicants were favored over older applicants even though the candidates were similar to each other in all respects except age (Bendick et al. 1996, 1999). More recently, Lahey (2005) detected evidence of age discrimination in hiring after mailing several thousand resumes to employers in two U.S. cities in an effort to determine the response of employers to younger and older job applicants. The applicants were all women applying for entry-level jobs and those under age 50 were more than 40 per cent more likely to be called for an interview than those aged 50 or older. A review of industrial gerontology and industrial psychology literature led Adams and Neumark (2006) to conclude that age does play a role in the assessment of job applicants and in promotion decisions; however, the research often relies on the hypothetical situations that may not be typical of what goes on in the real world.

Fig. 20.8 Number of age discrimination in employment Act Charges Filed with the EEOC, FY 1992–FY 2006



Source: Equal Employment Opportunity Commission, Enforcement Statistics, www.eeoc.gov/stats/charges.html.

Although most older workers believe that age discrimination is a problem (AARP 2002), only a minority say they have experienced it. For example, 15 per cent of workers aged 45–74 reported that they had not been hired for a job because of their age, while 9 per cent felt they had been passed up for a promotion; 6 per cent had been laid off; and 5 per cent had failed to get a raise because of their age (AARP 2002). The assumption, of course, is that these older workers believe that it was because they were old that they were discriminated against; it is possible that some were recalling past instances of being too young. However, since the entire survey dealt with issues of concern to older workers, this seems unlikely.

The fact that workers and unemployed job seekers more often report hiring discrimination than termination discrimination is surprising in light of the greater frequency of termination charges filed with the EEOC. Differences by employment status, however, are pronounced. In one survey, unemployed job seekers were nearly four times as likely as those working full time to report that they had not been hired because of their age (41 per cent versus 11 per cent), while part-time workers were about twice as likely as full-time workers to report that (20 per cent versus 11 per cent). The older jobseekers in this study have probably experienced not getting a job, which – whatever the reason for it – may appear to be age discrimination. Unemployed older men and women looking for work are also more likely than their employed counterparts to say that older workers face age discrimination than their employed counterparts (AARP 2002), most likely due

to the difficulties they have experienced while looking for work.

Older jobseekers are also more likely to say they have experienced being laid off or fired because of their age than full-time workers, very few of which report an age-based layoff or firing (AARP 2002). Older workers in the MetLife Mature Market Institute's 2006 survey of 55–70-year-old workers who had had unsuccessful job searches also often blamed age bias, with the percentage claiming it rising with age (MetLife Mature Market Institute 2006).

European older workers seldom mentioned age discrimination when asked by the European Foundation for the Improvement of Living and Working Conditions (2007a): “Over the past 12 months, have you or have you not been personally subjected at work to age discrimination?” Only 4.4 per cent of aged 55 and older workers replied affirmatively, a lower percentage than for workers under 25, 5.4 per cent of whom felt they had been discriminated against because of age.

Poll data such as these as well as charges filed with the appropriate jurisdictional agencies provide insights into *perceptions* of age discrimination. Research using testers and/or hypothetical situations, along with the longer and often less successful job searches that older workers experience, add support for the assumption that employers continue to base many employment decisions on age. Neumark (2001) suggested that the ADEA may have fostered the retention of older workers but may have reduced the hiring of them. This is unlikely due to animus. How much is based on real differences among applicants, cost concerns, or something else is unknown.

Conclusion

Older workers in the United States have not drawn the attention of policymakers that they have in the European Union and Japan, where the aging workforce is high on the policy agenda. A main reason is that the demographic situation in the United States, with its higher fertility rates and projected population increases, is more favorable than it is in many countries. Moreover, the U.S. Social Security system is not projected to become insolvent for several decades. This is in contrast to the far more strained (and generous) pension systems in other countries, although recent pension reforms in many have been designed to make retirement at very early ages less attractive. Also, as noted elsewhere in this chapter, the labor force participation rates at upper ages in the United States are quite high compared to many other countries; less generous public retirement benefits play a role in this.

Unlike the United States, the European Union has made a commitment to increasing employment rates for older persons, particularly those aged 55–64. In 2001, the European Council approved the Stockholm initiative to increase to 50 per cent the employment rate of persons aged 55–64 by 2010. The Barcelona initiative, issued in 2002, calls for a five-year increase in the effective retirement age (the age at which people actually retire). Countries must report annually on their progress on meeting these (and other) employment-related goals.

Eurostat data highlight sharp increases in the employment of older people across the European Union (including in member countries admitted since 2004). Table 20.8 shows changes in the employment rates of persons aged 55–64 since 2001, when the Stockholm target was established, for the 15 countries that were members of the EU at that time. By 2006, a number of countries had reached or exceeded the target, some by a wide margin.

The extent to which these percentages continue to increase in developed countries, among them the United States, depends on a variety of factors, including how important work is to the self-identity of older persons, the need for the income and other rewards that work provides, employer demand for labor and employers' perceptions of the ability of older workers to meet their needs. Assuming demand materializes, employers will have to introduce more programs and

Table 20.8 Employment Rate of Persons Aged 55–64, EU15, 2001 and 2006 (in percentages)

	2001	2006	Percentage point change 2001–2006
Austria	28.9	35.5	6.6
Belgium	25.1	32	6.9
Denmark	58	60.7	2.7
Finland	45.7	54.5	8.8
France	31.9	38.1	6.2
Germany	37.9	48.4	10.5
Greece	38.2	42.3	4.1
Ireland	46.8	53.1	6.3
Italy	28	32.5	4.5
Luxembourg	25.6	33.2	7.6
Netherlands	39.6	47.7	8.1
Portugal	50.2	50.1	-0.1
Spain	39.2	44.1	4.9
Sweden	66.7	69.6	2.9
United Kingdom	52.2	54.3	5.1
EU15	38.8	43.5	4.7

Source: Eurostat (2006), Employment rate of older workers by gender, available at http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1090,30070682,1090_33076576&_dad=portal&_schema=PORTAL, Accessed January 31, 2009.

policies that attract and retain the types of older workers they need. Work may give meaning and structure to daily life but workers seem to have come to expect more out of life than just employment at later ages.

References

- AARP (1995) American business and older workers: A road map to the 21st century, AARP, Washington, DC
- AARP (1998) Boomers look toward retirement. AARP, Washington, DC
- AARP (2000) American business and older employees, AARP, Washington, DC
- AARP (2002) Staying ahead of the curve. The AARP work and career study. AARP, Washington, DC
- AARP (2003) Staying ahead of the curve 2003: The AARP working in retirement study. AARP, Washington, DC
- AARP (2004) Baby boomers envision retirement II. AARP, Washington, DC
- AARP (2005) American business and older employees: A focus on Midwest employees. AARP, Washington, DC
- Adams SJ, Neumark D (2006) Age discrimination in US labor markets: A Review of the evidence. In: Rogers WM, III, (ed) Handbook on the economics of discrimination. Edward Elgar, Cheltenham, UK, pp 187–211
- American Society of Association Executives (2000, November 1) Aging angst. Association Management. Available at <http://www.thefreelibrary.com/AGING+ANGST.-a067590357>

- Barth MC, McNaught W, Rizzi P (1993) Corporations and the aging workforce. In: Mirvis PH (ed) *Building the competitive workforce*. John Wiley & Sons, New York, pp 156–200
- Bendick M Jr, Brown LE, Wall K (1999) No foot in the door: An experimental study of employment discrimination against older workers. *J Aging Soc Policy* 10(4):5–23
- Bendick M Jr, Jackson CW, Romero JH (1996) Employment discrimination against older workers: An experimental study of hiring practices. *J Aging Soc Policy* 8(4):25–46
- Bessey BL, Ananda SM (1991) Age discrimination in employment: An interdisciplinary review of the ADEA. *Res Aging* 13(4):413–457
- Blau D, Goodstein R (2007) What explains trends in labor force participation of older men in the United States? IZA DP No. 2991. Institute for the Study of Labor, Bonn
- Blinder AS (2005) Fear of offshoring. CEPS Working Paper No. 119. Center for Economic Policy Studies, Princeton, NJ, Available at <http://www.princeton.edu/~ceps/workingpapers/119blinder.pdf>
- Bond JT, Galinsky E, Kim SS, Brownfield E (2005) 2005 national study of employers. New York, NY: Families and Work Institute. Available at <http://familiesandwork.org/site/research/summary/2005nsesumm.pdf>
- Brown SK (2002) Impact of stock market decline on 50–70 year old investors. AARP, Washington, DC, Available at http://assets.aarp.org/rgcenter/econ/market_decline.pdf
- Brown SK (2005) Attitudes of individuals 50 and older toward phased retirement. AARP, Washington, DC, Available at http://assets.aarp.org/rgcenter/post-import/phased_ret.pdf
- Butrica BA, Johnson RW, Smith KE, Steuerle E (2004) Does work pay at older ages? Urban Institute, Washington, DC, Available at http://www.urban.org/uploadedpdf/411121_DoesWorkPay.pdf
- Cahill KE, Giandrea MD, Quinn JF (2007) Down shifting: The role of bridge jobs after career employment. Issue Brief 06. The Center on Aging and Work/Workplace Flexibility at Boston College, Chestnut Hill, MA
- Cappelli P (2003) What labor shortage? Debunking a popular myth. Knowledge@Wharton, August 27. Available at: <http://knowledge.wharton.upenn.edu/article.cfm?articleid=837&CFID=32752689&CFTOKEN=83083225&jsessionid=a830430c428137173c3c>
- Cappelli P (2004) Will there really be a labor shortage? *Public Policy Aging Rep* 14(3):1, 3–6
- Chan S, Stevens AH (2007) Is retirement being remade? Developments in labor market patterns at older ages. Presentation at the Pension Research Council 2007 Symposium, Managing Retirement Payouts: Positioning, Investing, and Spending. Philadelphia: Wharton School, University of Pennsylvania, April 23–24. Available at <http://www.pensionresearchcouncil.org/publications/document.php?file=312&download=1>
- Commonwealth Fund (1990) Ready, willing and able to work. Research Reports 1 & 2. Commonwealth Fund, Americans Over 55 at Work Program, New York
- Commonwealth Fund (1991) New findings show why employing workers over 50 makes good financial sense for companies. Commonwealth Fund, New York
- Copeland C (2007) Employment status of workers age 55 and older. *EBRI Notes*, 28(8):2–7
- Costa DL (1998) *The evolution of retirement: An American economic history, 1880–1990*. University of Chicago Press, Chicago
- Couch KA (1998) Late life job displacement. *Gerontologist* 38:7–17
- DeLong D (2006) The paradox of the “working retired” – Identifying barriers to increased labor force participation by older worker in the U.S. Paper prepared for an Academy of Management Critical Management Studies Research Workshop, Managing the Aging Workforce: Leadership towards a New Weltanschauung, Atlanta, August 11. Available at http://group.aomonline.org/cms/Meetings/Atlanta/Workshop06/Streams/Aging/CMS_per_cent20AgingWorkforcePaper-DeLong-FINAL6-21-06.pdf
- Dreifus C (2006, November 14) Focusing on the issue of aging, and growing into the job. *New York Times*. Available at <http://www.nytimes.com/2006/11/14/science/14conv.html>
- Equal Employment Opportunity Commission (2007) Age Discrimination in Employment Act (ADEA) charges, FY 1997–FY 2006. Available at <http://www.eeoc.gov/stats/adea.html>
- Eschtruth AD, Sass SA, Aubry J-P (2007) Employers lukewarm about retaining older workers. *Work Opportunities for Older Americans*, Series 10. Center for Retirement Research at Boston College, Chestnut Hill, MA
- European Foundation for the Improvement of Living and Working Conditions (2000) Working conditions in Europe not improving, according to survey. Dublin: Author. Available at http://ec.europa.eu/employment_social/news/2000/001218_2_en.htm
- European Foundation for the Improvement of Living and Working Conditions (2007a) Fourth European working conditions survey. Dublin: Author. Available at <http://www.eurofound.europa.eu/pubdocs/2006/98/en/2/ef0698en.pdf>
- European Foundation for the Improvement of Living and Working Conditions (2007b) Measuring job satisfaction in surveys – Comparative analytical report. Dublin: Author. Available at <http://www.eurofound.eu.int/ewco/reports/TN0608TR01/TN0608TR01.pdf>
- Eurostat (2006, September) Employment rate of older workers by gender. Available at http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1090,30070682,1090_33076576&_dad=portal&_schema=PORTAL
- Friedberg L, Webb A (2005) Retirement and the evolution of pension structure. *J Hum Res* 40(2):281–308
- Haider S, Loughran D (2001) Elderly labor supply: Work or play? RAND Labor and Population Program Working Paper Series 01–09. Santa Monica, CA: RAND. Available at <http://www.rand.org/labor/DRU/DRU2582.pdf>
- Hamermesh DS (2005) Why not retire? The time and timing costs of market work. WP 2005-104. Ann Arbor, MI: University of Michigan Retirement Research Center, 005. Available at http://www.mrrc.isr.umich.edu/publications/publications_download.cfm?pid=353
- Hammond PB, Morgan HP (eds) (1991) *Ending mandatory retirement for tenured faculty: The consequences for higher education*. National Academy Press, Washington, DC
- Helman R, Mathew Greenwald & Associates, VanDerhei J, Copeland C (2007) The retirement system in transition: The 2007 Retirement Confidence Survey. Issue Brief No. 304. Employee Benefit Research Institute, Washington, DC
- Helman R, Mathew Greenwald & Associates, Copeland C, VanDerhei J (2006) Will more of us be working forever? The 2006 Retirement Confidence Survey. Issue Brief No. 292. Employee Benefit Research Institute, Washington, DC

- Hipple S (1999) Worker displacement in the mid-1990s. *Mon Labor Rev* 122(7):15–32
- Hutchens R (2003) The Cornell study of employer phased retirement policies: a report on key findings. Cornell University School of Industrial and Labor Relations, Ithaca, NY. Available at <http://www.ilr.cornell.edu/extension/files/20031219112155-pub1251.pdf>
- ICF Incorporated (1995) Valuing older workers. A study of costs and productivity. AARP, Washington, DC
- Johnson R (2002) The puzzle of later male retirement. *Economic Rev*, Third Quarter, 5–26
- Johnson RW, Mermin G, Steuerle CE (2006) Work impediments at older ages. Urban Institute, Washington, DC
- Johnson RW, Mermin G, Resseger M (2007) Employment at older ages and the changing nature of work. PPI Issue Paper #2007-20. AARP Public Policy Institute, Washington, DC
- Judy RW (1999, October 15) Labor forecast: gray skies, worker drought continues. *HR Magazine*. Available at: http://findarticles.com/p/articles/mi_m3495/is_11_44/ai_58174731
- Karoly LA, Zissimopoulos J (2004) Self-employment and the 50+ population. PPI Issue Paper #2004-03. AARP, Washington, DC
- Kelloway EK, Gallagher DG, Barling J (2004) Work, employment and the individual. In: Kaufman BE (ed) *Theoretical perspectives of work and the employment relationship*. Industrial Relations Research Association, Champaign, IL, pp 105–131
- Lahey J (2005) Do older workers face discrimination? An Issue in Brief, No. 33. Center for Retirement Research at Boston College, Chestnut Hill, MA
- Manton KG, Gu X (2001) Changes in the prevalence of chronic disability in the United States black and non-black population above age 65 from 1982 to 1999. *Proc Nat Acad Sci USA* 98(11):6354–6359
- Marshall VW (2001) Challenges facing older workers in developed nations. Slides and text from a plenary address to the Gerontological Society of Singapore regional conference, January 12–14. Available at <http://www.aging.unc.edu/info-center/resources/2001/marshallv1.pdf>
- Mermin GBT, Johnson RW, Murphy D (2006) Why do boomers plan to work so long? Discussion Paper 06-04. Urban Institute, Washington, DC
- Metlife Mature Market Institute, David DeLong and Associates, & Zogby International (2006) Living longer, working longer: The changing landscape of the aging workforce – a Metlife study. Metlife, New York
- Munnell AH (2006) Policies to promote labor force participation of older people. Working Paper 2006-2. Center for Retirement Research at Boston College, Chestnut Hill, MA
- Munnell AH, Libby J (2007) Will people be healthy enough to work longer? An Issue in Brief, No. 7–3. Center for Retirement Research at Boston College, Chestnut Hill, MA
- Munnell AH, Perun P (2006) An update on private pensions. An Issue in Brief, No. 50. Center for Retirement Research at Boston College, Chestnut Hill, MA
- Munnell AH, Buessing M, Soto M, Sass S (2006) Will we have to work forever? An Issue in Brief, Series 4. Center for Retirement Research at Boston College, Chestnut Hill, MA
- Munnell AH, Cahill KE, Jivan NA (2003) How has the shift to 401(k)s affected the retirement age? An Issue in Brief, No. 13. Center for Retirement Research at Boston College, Chestnut Hill, MA
- Munnell AH, Sass SA, Aubry, J-P (2006) Employer survey: 1 of 4 boomers won't retire because they can't. An Issue in Brief, Work Opportunities for Older Americans, Series 6. Center for Retirement Research at Boston College, Chestnut Hill, MA
- Munnell AH, Sundén A, Lidstone E (2002) How important are private pensions? An Issue in Brief, No. 8. Center for Retirement Research at Boston College, Chestnut Hill, MA
- National Alliance for Caregiving and AARP (2004) Caregiving in the U.S. National Alliance for Caregiving and AARP. Available at: <http://www.caregiving.org/data/04finalreport.pdf>
- National Center for Health Statistics (NCHS) (2006) Health, United States, 2006. Hyattsville, MD: NCHS
- National Council on the Aging (NCOA) (2002) American perceptions of aging in the 21st century. NCOA, Washington, DC, Available at http://www.ncoa.org/Downloads/study_aging.pdf.pdf
- Neumark D (2001) Age discrimination legislation in the United States. Working Paper 8152. National Bureau of Economic Research, Cambridge, MA
- Neumark D (2008) Reassessing the age discrimination in employment act. PPI Research Report #2008-09. AARP Public Policy Institute, Washington, DC. AARP, Washington, DC
- Organization for Economic Cooperation and Development (OECD) (2005) Aging and employment policies: United States. OECD, Paris
- Organization for Economic Cooperation and Development (OECD) (2006) Live longer, work longer. OECD, Paris
- Penner RG, Johnson RW (2006) Health care costs, taxes, and the retirement decision: Conceptual issues and illustrative simulations. Urban Institute, Washington, DC, Available at http://www.urban.org/UploadedPDF/411394_Health_Care_Costs.pdf
- Pennsylvania State University (1992) Alternatives to chronological age in determining standards of suitability for public safety jobs. Volume I: Technical report. Pennsylvania State University, Center for Applied Behavioral Sciences, University Park, PA
- Pew Research Center (2006) Working after retirement: The gap between expectations and reality. Washington, DC: Pew Research Center. Available at <http://pewresearch.org/assets/social/pdf/Retirement.pdf#search=%22%22The%20gap%20between%20expectations%20and%20reality%20%22>
- Purcell P (2006) Older workers: Employment and retirement trends. Congressional Research Service, Washington, DC. Available at http://assets.opencrs.com/rpts/RL30629_20060907.pdf
- Quinn JF (1998) New paths to retirement. Paper presented at the Pension Research Council Conference, “Forecasting Retirement Needs and Retirement Wealth”. Philadelphia: Wharton School, University of Pennsylvania, April 27–28
- Rebick M (1993) The Japanese approach to finding jobs for older workers. In: Mitchell O (ed) *As the workforce ages*. ILR Press, Ithaca, NY, pp 103–124
- Rix S (2006) Update on the aged 55+ worker: 2005. AARP, Washington, DC

- Rix S (1996) Update on the older worker in 1995. AARP, Washington, DC
- Romans F (2007) The transition of women and men from work to retirement. Statistics in focus, 97/2007. Eurostat, European Communities, Available at http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-07-097/EN/KS-SF-07-097-EN.PDF
- Rotenberg J (2006) The retirement challenge: Expectations vs. reality. Presentation at the EBRI/AARP Pension Conference, Washington, DC, May 15
- Ruhm CJ (1990) Bridge jobs and partial retirement. *J Labor Econ* 8(4):482–501
- Schulz JH (1988, November) Job matching in an aging society: Barriers to the utilization of older workers. Paper delivered at the annual meeting of the Gerontological Society of America, San Francisco
- Social Security Administration, Office of Policy (2006) Annual statistical supplement to the Social Security Bulletin, 2005. Washington, DC: U.S. Government Printing Office
- Soldo BJ, Mitchell OS, Tfraily R, McCabe JF (2006) Cross-cohort differences in health on the verge of retirement. Working Paper #12762. Cambridge, MA: National Bureau of Economic Research
- Sterns HL, McDaniel MA (1994) Job performance and the older worker. In: Rix SE (ed), *Older workers: How do they measure up?* AARP, Washington, DC, pp 27–51
- Steuerle E, Spiro C, Johnson RW (1999) Can Americans work longer? Straight talk on social security and retirement policy No. 5. Urban Institute, Washington, DC. Available at <http://urbaninstitute.org/UploadedPDF/Straight5.pdf>
- Taylor H (2002, May 15) The new vision of retirement is very different than the traditional image of retirement. The Harris poll #23. Available at http://www.harrisinteractive.com/harris_poll/printfriendly/index.asp?PID=301
- Toossi M (2005) Labor force projections to 2014: retiring boomers. *Mon Labor Rev* 128(11):25–44
- Toossi M (2006) A new look at long-term labor force projections to 2050. *Mon Labor Rev* 129(11):19–39
- Toossi M (2007) Labor force projections to 2016: more workers in their golden years. *Mon Labor Rev* 130(11):33–52
- Towers Perrin (2005) The business case for workers 50+: Planning for tomorrow's talent needs in today's competitive environment. AARP, Washington, DC
- Uccello CE (1998) Factors influencing retirement: Their Implications for Raising Retirement Age. PPI Issue Paper #9810. AARP, Washington, DC
- Urban Institute (2006) Work and retirement: Facts and figures. Urban Institute, Washington, DC, Available at http://www.urban.org/UploadedPDF/900985_work_and_retirement.pdf
- U.S. Congress (1979) American attitudes toward pensions and retirement. Hearing before the Select Committee on Aging, House of Representatives, February 28, Comm. Pub. No. 95–184
- U.S. Congress, Congressional Budget Office (2004a, March) The retirement prospects of the baby boomers. CBO Economic and Budget Issue Brief. Washington, DC. Available at <http://www.cbo.gov/ftpdocs/51xx/doc5195/03-18-BabyBoomers.pdf>
- U.S. Congress, Congressional Budget Office (2004b, May) Retirement age and the need for saving. CBO Economic and Budget Issue Brief. Washington, DC. Available at <http://www.cbo.gov/ftpdocs/54xx/doc5419/05-12-RetireAgeSaving.pdf>
- U.S. Congress, Congressional Budget Office (2004c, November) Disability and retirement: The exit of baby boomers from the labor force. Congressional Budget Office, Washington, DC. Available at <http://www.cbo.gov/ftpdocs/60xx/doc6018/11-22-LaborForce.pdf>
- U.S. Department of Commerce, Bureau of the Census (1975) Historical statistics of the United States, Colonial times to 1970, Part 1. U.S. Government Printing Office, Washington, DC
- U.S. Department of Health and Human Services, National Institutes of Health, National Institute on Aging (2007) Growing older in America. National Institute on Aging, Bethesda, MD
- U.S. Department of Labor, Bureau of Labor Statistics (1996, January) Employment and earnings 43(1) U.S. Government Printing Office, Washington, DC
- U.S. Department of Labor, Bureau of Labor Statistics (2006a, January) Employment and earnings 53(1) U.S. Government Printing Office, Washington, DC
- U.S. Department of Labor, Bureau of Labor Statistics (2006b, September) Employee tenure in 2006. News USDL 06-1563. Bureau of Labor Statistics, Washington, DC
- U.S. Department of Labor, Bureau of Labor Statistics (2007, January) Employment and earnings 54(1) U.S. Government Printing Office, Washington, DC
- U.S. Department of Labor, Bureau of Labor Statistics (2008) Labor force statistics from the Current Population Survey. Available at <http://data.bls.gov/PDQ/outside.jsp?survey=ln>
- U.S. General Accounting Office (2001) Older workers: Demographic trends pose challenges for employers and workers, GAO-02-85. U.S. General Accounting Office, Washington, DC
- Watson Wyatt Worldwide (2002) Tight labor markets are just around the corner...again. Available at: <http://www.watsonwyatt.com/us/pubs/insider/showarticle.asp?ArticleID=9814>
- Wegman DH, McGee JP (Eds) (2004) Health and safety needs of older workers. The National Academies Press, Washington, DC
- Weir DR (2007) Are baby boomers living well longer? In: Madrian B, Mitchell OS, Soldo BJ (eds), *Redefining retirement: How will boomers fare?* Oxford University Press, Oxford, pp 95–111
- Yakoboski P (1998) Debunking the retirement policy myth: Lifetime jobs never existed for most workers. EBRI Issue Brief No. 197. Employee Benefit Research Institute, Washington, DC
- Yakoboski P, Dickemper J (1997) Increased saving but little planning: Results of the 1997 Retirement Confidence Survey. EBRI Issue Brief No. 191. Washington, DC: Employee Benefit Research Institute

Chapter 21

Population Retirement Patterns

David J. Ekerdt

Introduction

Demographic interest in occupational retirement has two bases. One is retirement's role in the renewal and repopulation of groups and social institutions. Retirement, while occasioned by aging, is not a necessary societal practice and it only became commonly available to workers during the 20th century. Yet it has proven useful in arranging and managing orderly succession within firms, organizations and labor markets, thus contributing to their continuity as the young replace the old. In addition to managing turnover, retirement is also of demographic interest because it segments the life course. In contemporary practice, withdrawal from work typically occurs at ages far in advance of disability and death. For example, life expectancy exceeds the average age of retirement in European nations by about 15–20 years (Table 21.1), which is also comparable to the experience in Japan and the United States. As a consequence, this pattern opens up a new stage of the life course between employment and death, making a population segment available for age-specific migration, economic behavior, political activity and lifestyles that are potentially discontinuous with the major adult roles of work and family.

This chapter will summarize issues in the definition and explanatory framework for retirement, examine current cross-national patterns of work withdrawal

and review the late 20th century trend toward earlier retirement along with more recent moves to reverse that trend. It concludes by naming several implications of a retirement stage.

Defining Retirement

Retirement is a multidimensional term that variously connotes a status within the life course, a temporal event that marks the transition to a post-employment stage and a longer-term process of individual anticipation and adaptation. As a status, multiple criteria are available for defining its commencement (Ekerdt and DeViney 1990). First, retirement may be said to begin when an older worker separates from a job, occupation, or employer with which there has been a long association. The difficulty with this criterion is that it relies on one indeterminate concept (career) to define another (retirement). Second, retirement can be defined as an exit from the labor force (zero hours worked, zero wages) when there is also no search for further employment. Operationally, this is the most convenient way to classify persons as retired, although the method groups together as non retired all sorts of labor force attachments (full-time, part-time, seasonal) that constitute different kinds of experience. A third criterion moves retirement farther up the labor supply distribution, naming retirement as a substantial reduction in work effort or earnings. This can be measured longitudinally for individuals, comparing present activity to a prior baseline, or cross-sectionally by using a cutoff level of work or earnings that is lower-than-norm. The choice of cutoff is usually arbitrary, e.g. 20 hours per week. Fourth, pension receipt is another way to identify retirees. Public and private pensions are gained by meeting

D. J. Ekerdt
Department of Sociology
Gerontology Center
University of Kansas
1000 Sunnyside Ave., Room 3090
Lawrence, KS, USA
E-mail: dekerdt@ku.edu

Table 21.1 European life expectancy at age 60 and average age of withdrawal from the labor market, by gender

	Life expectancy at 60 (2002)		Average age of labor market withdrawal (2005)		
	Men	Women	Total	Men	Women
Austria	20.2	24.1	59.8	60.3	59.4
Belgium	19.6	23.9	60.6	61.6	59.6
Czech Republic	17.3	21.5	60.6	62.3	59.1
Denmark	19.1	22.4	60.9	61.2	60.7
Estonia	15.4	21.3	61.7		
Finland	19.5	24.0	61.7	61.8	61.7
France	20.8	25.8	58.8	58.5	59.1
Germany	19.8	23.9	61.3	61.4	61.1
Greece	20.6	23.2	61.7	62.5	61.0
Hungary	16.1	20.9	59.8	61.2	58.7
Ireland	19.2	22.9	64.1	63.6	64.6
Italy	20.4	24.8	59.7	60.7	58.8
Latvia	15.2	20.8	62.1		
Lithuania	16.1	21.7	60.0		
Luxembourg	19.6	24.2	59.4		
Netherlands	19.5	23.5	61.5	61.6	61.4
Poland	17.1	22.0	59.5	62.0	57.4
Portugal	19.4	23.3	63.1	62.4	63.8
Slovak Republic	16.3	21.0	59.2	61.1	57.6
Slovenia	17.9	23.1	58.5		
Spain	20.6	25.2	62.4	62.0	62.8
Sweden	20.9	24.3	63.7	64.3	63.0
United Kingdom	19.9	23.2	62.6	63.4	61.9

Source: Statistical Office of the European Communities (ec.europa.eu/eurostat).

eligibility criteria that are some amalgam of age, tenure, organizational separation, reduced effort, or exit. Some kinds of pension receipt, however, may not bar pensioners from continued work. Age-accession to pension eligibility also allows unemployed and disabled persons to convert their status to retirement. Fifth, people can self-define as “retired,” which is useful for resolving the question of who exactly is behaving as if having entered a new status. The objective contours of this subjective identity can be quite variable and claims about being retired can be difficult to interpret when individuals have had irregular work patterns or chronic unemployment.

Happily a number of these single criteria converge empirically but not so completely as to exclude arguable or arbitrary classifications when partitioning a sample or population into retired and non retired. Cross-sectional partitioning also entails an assumption that persons eligible to be “retired” had formerly had labor force attachment. To say that 80 per cent of the population over the age of 65 is not in the labor force is not quite the same as saying that 80 per cent have departed the worker role. A further definitional

difficulty is temporal: retirement can be punctuated by spells of reemployment so that the status cannot always be regarded as fixed.

At the population level, age is sometimes used as a proxy for retirement, relying on such ages as 60, 65, or 70. For example, migration that occurs at ages above the cutoff is conventionally termed retirement migration (Haas et al. 2006). Age is also a retirement proxy in the calculation of dependency ratios where it is assumed that the population above the cutoff is economically inactive or not productive, thus dependent on the younger, “working age” population for support. Such classifications by age are convenient but crude, overlooking the diversity of employment experience and resources on both sides of the age boundary. In the U.S. in 2004, many working-age people did not work – 17.2 per cent were not working at ages 25–54 and 37.7 per cent at ages 55–64 – and many retirement-age people did work – 14.4 per cent over the age of 65 (Toossi 2005). Any use of age as a retirement proxy and indeed the use of any single criterion cited above, will involve some misclassification by any other definitional criterion.

Multiple criteria (e.g. reduced effort plus pension receipt) can make the focal category “retired” more precise but this also shifts the ambiguous cases to the residual category of the non retired. In the end, retirement should be defined in a way that is suitable to the problem and disciplinary interest at hand, whether to estimate the proportion who are retired; describe the scheduling or sequence of transitions; examine economic behavior; or study social identity in later life.

The foregoing discussion has focused on the *form* that retirement can take: career separation, exit, pension receipt, etc. There is also the matter of the *timing* of these events: when they occur in the course of individual lives and their typical occurrence in population groups. An analyst fortunate enough to have extensive, even time-series, information on form and timing can proceed to describe individual pathways and typify normative sequences across groups or time (Disney et al. 1997; Mutchler et al. 1997). At the same time, there are regions with agrarian or family-based economies within which even simple designation of labor force activity or exit is ambiguous. For example, should unpaid family workers or part-year workers count as labor force participants (ILO 2006: p. 3)? Analysts sometimes estimate, for comparative purposes, a national “average age of retirement” that is nevertheless based on labor force participation rates at older ages (Johnson 2001).

For the purpose of describing population-level patterns of retirement for cross-national and historical comparisons, the convention has been to use measures of labor force participation. This is the proportion of persons in a population that furnishes labor for the production of goods and services and it includes the employed and the presently unemployed. In form, this is (in obverse) the definitional criterion of labor force exit. To capture timing, labor force participation is described at particular ages. Relative levels of (reduced) participation above the age of 55, 60, or 65 suggest the extent of retirement in population groups. With the definitional caveats noted above, this is the most comparative metric available.

Explaining Retirement

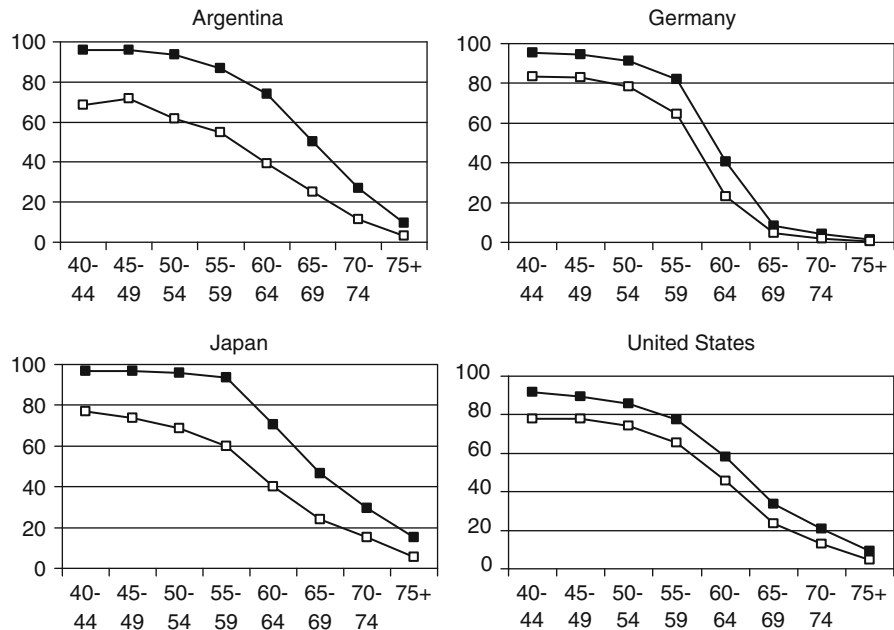
Why workers retire is a question that can be divided further as: Why do people retire *at all*? And why do people retire *as they do*?

The *why-at-all* question is answered with reference to two recurring issues about aging workers that appear in the historical record when retirement-like activity is recorded. These two issues – succession and the withdrawal motive – are constants that generate retirement practices across time and place (Ekerdt 2002). Succession, as noted at the outset, is an essential problem for social groups. To survive their mortal members and endure, groups must devise ways for the young to succeed the old, at least in those roles crucial to the continuity and integrity of the group (Riley et al. 1988). This may be done in foresighted ways by administrative and legal means, or opportunistically when juniors feel strong enough to lay claim to the authority and resources of their elders. Unless a family, faction, or organization is willing to wait for death to create turnover – an inherently uncertain method – the succession matter must be managed somehow.

The other constant that generates retirement practices is a common, though not universal, desire among workers to withdraw from work and responsibility in later life. This withdrawal motive possibly arises from developmental attempts to manage age-related vulnerability (Baltes and Baltes 1990), or it may reflect cultural ideas about old age, such as the ancient Hindu model for renunciation of worldly pursuits (Savishinsky 2004). Relief from labors and burdens, however, is only feasible if there is available some sort of replacement income or means of support. Prior to modern pension arrangements, fortunate elders used property, assets, contracts, dowries and other family transfer strategies to leverage an income for old age and so achieve a sort of retirement (Haber and Gratton 1994; Shahar 1997). Lacking these means, older people cannot withdraw. And neither, for that matter, does the social order everywhere require a succession program for all workers; indeed, there are settings in which the labor and contributions of elders may be crucial as long as they live (Kinsella and Phillips 2005). Examples of such circumstances are subsistence agriculture, domestic enterprises and lifelong religious headships. Retirement is, thus, an optional social practice but it does meet perennial needs of individual and group alike.

As to why people retire *as they do* in particular times and places – the form and timing of withdrawal – explanation can begin in social structure or individual agency but, to be complete, must acknowledge both. Figure 21.1 shows current levels of labor

Fig. 21.1 Labor force participation rates in 2005 by age for men (■) and women (□)



Source: OECD Statistics (www.oecd.org/statsportal).

force participation by age for women and men in Argentina, Germany, Japan and the United States, just to take some national examples. Within a limited age span centered around the 60s, the adult population turns over from one that mainly works to one that is no longer employed. The definite age form of this fall-off in employment suggests the influence of social structure. But the conversion of the adult population from work to nonwork is also not completely abrupt, suggesting individual variation and discretion in the timing of retirement transitions.

Three basic features of social structure shape retirement practices: the labor market, the welfare state and the symbolic life course. Labor market demand for older workers steers the onset of retirement (assuming replacement income) toward earlier or later ages. Earlier exits are observed in occupations that are physically demanding; in occupations where technological change causes skill obsolescence; where there is age discrimination in employment; and where closed employment systems discourage mobility between jobs, labor-force re-entry and part-time employment. Exits also increase during economic recessions, such as those of the early 1980s and early 1990s. Work lives are extended in industries or economies with more service-sector jobs; in occupations where skills and

knowledge cumulate; in systems of employment relationships that protect seniority and reward experience with higher wages; and when economies have larger shares of self-employed or professional workers, persons with more control over their working conditions. Systems of employment relations and maintenance are in turn shaped by the regulatory and policy activity of governments, by employer interests and by workers' representatives, such as trade unions. A labor market for older workers is also affected by the labor supply of other populations and groups: younger workers proceeding from baby booms or birth dearths, or foreign workers within those occupations exposed to cross-national competition.

State bureaucracies formulate retirement policy directly by means of arrangements for income security in old age, thus enabling the replacement income that is necessary to this status. The foremost policy tool of the welfare state is a pension program that manipulates incentives to leave the labor force. Public pensions as well as state-facilitated occupational and private pensions (e.g. fostered by tax advantages) encourage retirement to the extent that they are more generous, enforce specific age incentives or even mandates and cover a broad share of the labor force. Not only do pensions reduce the risk of poverty in old age (a policy

objective that is worthy in its own right), they likewise induce workers to leave employment, thus opening jobs for younger workers and paving the way for succession within firms, industries and the labor market as a whole. The welfare state can shape retirement patterns in other ways: by arranging unemployment and disability compensation that bridge to retirement; by legislating safeguards against dismissals; by financing access to health care in later life; by tax policy that encourages saving and wealth building all along the life course; and by the support of employment and training programs that retain older workers up to or even past normal retirement ages.

A third structural context for retirement is the symbolic life course, which is a shared cultural idea about the way that life should go (Dannefer and Uhlenberg 1999). In modern economies, people are socialized to an idealized map of life time that conveys, among other things, expectations about a normative age for retirement (Kohli 1986). For example, de Vroom (2004) pointed to the early-exit “retirement culture” of France and the late-exit culture of Norway. Such expectations organize the experience and behavior of individual workers in the years leading up to the event. The same norms lead employers and co-workers to make assumptions about the remainder of older workers’ tenure. Cultural adoption of a retirement standard comes to be seen not only as the normal course of life but also, when financed by social transfers, as an earned social right. Any threat to this right or the conventional schedule for withdrawal will generate political resistance. In addition to age norms about work and withdrawal, other relevant dimensions of the symbolic life course include understandings about the privileges of seniority as well as moral assumptions about the mutual obligations between generations. Such cultural ideas will underpin familial or political support for retired elders.

Social structure establishes a field for retirement practices but explanation must also acknowledge individual discretion in the choice of time and form. Personal decisions whether to work or retire may be made in consideration of several factors. Health and cognitive ability must remain sufficient for job performance. Conversely, continued good health may make the release of retirement all the more desirable, that is, taking advantage of the opportunity “while still healthy.” To choose withdrawal, replacement

income from pensions, savings and perhaps continued employment must seem adequate and secure. The welfare state sets a framework for personal finances at the point of retirement but actual results are the harvest of lifelong circumstances unique to the individual. Working conditions are a decisional determinant, including the quality of supervision, relations with co-workers, satisfaction with compensation, comfort with job assignments, control over the pace or content of work, alignment with the employer’s values and the viability of the work organization. Another factor is workers’ relative valuation of work as a means of identity as compared to the pleasure and self-development that leisure would allow. Family considerations also enter in. Spouses in dual-earner households may make joint decisions to coordinate retirement. Older workers with dependent children may need to delay retirement but older workers with dependent elders may accelerate their withdrawal to gain more time for caregiving.

Economic, political and cultural institutions create an opportunity structure for retirement, both in setting succession arrangements and norms and in shaping the life chances of older workers. This broad channeling toward retirement outcomes (or continued work) is then individualized in decision making as workers consider proximate, emerging circumstances of health, finance, workplace, values and family. Every retirement is a mix of push and pull factors, is to some extent voluntary or involuntary and is based in financial, bureaucratic, functional and personal considerations. It is important to acknowledge individual agency because comparative, macro-level discussions of retirement patterns tend to focus on state and labor market policy for retirement and old age as the mainspring of this behavior. It is also important to note that retirement patterns across time and place may in part be epiphenomenal – secondary counterparts of other developments in capital markets, taxation, demographics, unemployment, technology and increasing globalization. Retirement patterns, further, may be an unintended consequence of social welfare, unemployment and disability programs.

Current Patterns

Retirement may be a ubiquitous idea but it only becomes widely prevalent in a population when societal institutions “are capable of supporting large numbers

Table 21.2 Recent labor force participation rates by sex, age and standing on the U.N. Human Development Index

Nation (Census date)	Men			Women		
	55–59	60–64	65+	55–59	60–64	65+
HUMAN DEVELOPMENT INDEX = HIGH						
Argentina (2005)	86.8	74.0	28.0	55.0	39.2	11.5
Australia (2005)	74.9	54.6	11.3	54.2	31.0	4.2
Austria (2005)	65.2	20.2	5.0	39.0	8.3	1.7
Belgium (2005)	56.5	25.1	2.2	34.0	10.9	0.8
Canada (2005)	76.2	53.9	12.1	60.4	35.0	5.0
Chile (2005)	83.7	71.5	24.6	38.9	24.0	7.0
Czech Republic (2005)	82.8	34.4	6.2	49.0	13.1	2.4
Denmark (2005)	86.3	47.6	9.2	79.8	29.1	2.7
Finland (2005)	69.3	37.6	4.5	72.5	32.4	1.6
France (2004)	67.7	19.0	1.8	56.2	16.2	0.8
Germany (2005)	82.0	40.6	5.0	64.4	23.0	2.1
Greece (2005)	73.2	44.9	6.9	32.8	20.6	1.9
Hungary (2005)	59.6	21.2	4.2	43.4	9.8	1.6
Iceland (2005)	92.2	86.3	45.5	86.7	74.4	22.4
Ireland (2005)	73.8	60.0	14.6	46.4	28.2	3.3
Israel (2005)	75.9	56.5	16.8	56.6	27.8	5.7
Italy (2005)	57.4	28.8	6.0	32.2	9.4	1.1
Japan (2005)	93.6	70.3	29.4	60.0	40.1	12.7
Luxembourg (2005)	58.2	15.1	1.0	36.7	11.0	0.4
Malaysia (2000)	75.1	61.6		28.5	23.2	
Mexico (2005)	85.7	71.4	46.4	34.7	25.9	14.5
Netherlands (2005)	77.8	30.9	7.4	49.3	18.0	2.0
New Zealand (2005)	86.0	70.7	15.6	71.9	49.8	7.2
Norway (2005)	81.5	59.7	15.8	70.5	48.4	10.5
Poland (2005)	52.4	27.7	9.3	29.4	14.0	3.9
Portugal (2005)	73.1	49.5	24.6	53.1	37.9	13.2
Romania (2005)	58.2	35.8	16.8	39.1	26.8	13.0
Slovak Republic (2005)	79.8	22.0	2.4	26.9	7.6	0.8
South Korea (2005)	80.7	66.7	41.3	49.1	43.4	22.5
Spain (2005)	75.4	48.8	3.2	37.7	20.4	1.1
Sweden (2005)	85.8	65.1	7.8	79.5	56.9	2.6
Switzerland (2005)	89.1	67.7	11.3	71.1	44.8	4.8
United Kingdom (2005)	78.5	55.2	9.4	63.1	31.7	4.4
United States (2005)	77.6	57.0	19.0	65.0	45.4	11.1
HUMAN DEVELOPMENT INDEX = MEDIUM						
Bangladesh (2003)	97.3	87.8	66.1	17.1	13.4	8.7
Brazil (2004)	77.6	64.9	35.1	45.5	30.9	14.1
Cambodia (2004)	88.5	78.5	54.6	69.1	58.2	35.2
China (2003)	80.2	69.8	27.4	40.7	26.8	9.3
Ecuador (2005)	91.9	83.9	47.4	53.0	38.6	21.5
Egypt (2002)	98.3 ^a	33.7	16.3	10.3 ^a	2.1	1.4
Ghana (2000)	91.0	80.3	64.7	82.0	71.7	52.2
Guatemala (2004)	92.5	92.2	66.7	39.7	30.3	23.7
India (2001)	92.0 ^a	69.7 ^b	45.4 ^c	40.9 ^a	26.3 ^b	12.0 ^c
Indonesia (2005)	91.2	68.5 ^d		57.4	36.6 ^d	

Table 21.2 (continued)

Nation (Census date)	Men			Women		
	55–59	60–64	65+	55–59	60–64	65+
Iran (2005)	73.4	62.5	40.6	12.5	9.6	4.5
Kazakhstan (2004)	84.9	50.7	13.0	61.9	23.4	7.5
Madagascar (2003)	97.1	88.8	80.7	86.8	78.7	63.7
Morocco (2005)	87.6 ^c	40.0 ^d		30.4 ^c	12.5 ^d	
Nepal (1999)	94.4	89.8	66.3	83.6	69.4	39.9
Pakistan (2004)	89.7	76.5	48.7	18.6	17.7	9.8
Peru (2005)	78.0	68.6	28.8	41.8	24.7	11.3
Philippines (2005)	81.7 ^f		51.6	55.3 ^f		29.4
Russian Federation (2005)	61.4	46.7	15.8 ^g	42.4	27.9	9.5 ^g
South Africa (2003)	63.5	40.6	25.6	38.4	15.2	9.6
Sudan (1996)	97.3	89.2	73.0	21.7	20.9	11.3
Syrian Arab Rep. (2003)	55.4	52.3	37.4	10.1	6.9	4.3
Thailand (2005)	92.0 ^a	51.0 ^d		70.4 ^a	28.8 ^d	
Turkey (2005)	53.0	40.1	24.2	18.4	15.3	7.6
Ukraine (2005)	67.6	32.2		37.6	24.7	
Venezuela (2002)	90.3 ^b		45.5	54.9 ^b		15.5
Viet Nam (2004)	78.3	48.8	17.3	56.3	36.5	11.4
HUMAN DEVELOPMENT INDEX = LOW						
Ethiopia (2005)	96.4	94.5	76.3	76.3	62.9	39.9
Malawi (1998)	97.9	97.2	93.8	90.9	90.0	84.0
North Korea (2005)	80.7	66.7	41.3	49.1	43.4	22.5
Mozambique (1997)	90.0	88.4	83.6	89.0	85.4	77.0
Niger (2001)	95.8	85.7	75.4	32.2	41.6	28.3
Nigeria (2003)	93.0	88.6	68.4	63.6	48.1	27.9
Tanzania (2001)	98.2	94.0	78.4	89.4	80.9	51.6
Zimbabwe (1997)	94.4	87.2	75.7	84.9	76.9	59.1

Sources: International Labour Organization (laborsta.ilo.org), OECD Statistics (www.oecd.or/statsportal) and United Nations Development Programme (2006).

^aAge range is 50–59; ^bAge range is 60–69; ^cAge range is 70+; ^dAge range is 60+; ^eAge range is 45–59; ^fAge range is 55–64; ^gAge range is 65–72; ^hAge range is 45–64.

of persons whose labor is not essential to the economic order” (Donahue et al. 1960: 331). The general facilitating requirements are an advanced economy, an effective national state and a demographic structure with significant numbers of older people.

The worldwide prevalence of retirement can be appreciated from the arrays in Table 21.2. Rates of labor force participation by age and sex are reported for 69 nations. Included here are nations that are among the 20 most populous or among the members of the Organization for Economic Cooperation and Development and for whom employment activity data (by age and sex) were available from ILO and OECD sources. Figures for China and Nigeria are estimates. The countries in Table 21.2 are further grouped

into three tiers – high, medium, low – according to their standing on the United Nations Development Programme’s Human Development Index (HDI) for 2006. The HDI incorporates measures of life expectancy, literacy, education and standards of living into a comparative measure of national well-being.

Patterns among men, for whom adult employment is normative, will be examined first. The reduction in labor force participation across age groups is taken as evidence of a growing share of retired persons in the older population. Among men in countries with high human development, retirement is common. Participation rates among men aged 65 and older are only one-third as high as among men aged 55–59 (Iceland, Mexico and South Korea being exceptions) and in

most nations the rate at age 65+ is less than 20 per cent as high as that in the younger group.

The life course staging of men's retirement is nonetheless variable within this development category. One group of nations from Continental and Post-socialist Europe evinces an early retirement pattern, having labor force participation rates less than 70 per cent at ages 55–59. These rates, already low, fall by half again or more at 60–64 and then into single digits above age 65. This group includes Austria, Belgium, Finland, France, Hungary, Italy, Luxembourg and Poland. The pace of labor force exit by age is also steep in the Czech Republic, Germany (see Fig. 21.1), the Netherlands and the Slovak Republic.

Retirement comes later in another group of nations among which rates fall by no more than one quarter between the first two age groups and are still in double digits at age 65+. This pattern is geographically diverse but dominated by Anglophone countries: Argentina, Australia, Canada, Chile, Iceland, Ireland, Israel, Japan, New Zealand, Norway, Switzerland and the United States. The rest of the developed nations not already mentioned line up somewhere between these two patterns.

In the tier of countries with a medium level of human development there is a larger amount of unavailable, incomplete, or approximate data on labor force activity. The overall observation here is that men's levels of labor force participation at ages 60–64 and 65+ are generally higher than seen in the first tier. Indeed, levels of activity exceeding 50 per cent after age 65 are not unusual. Three nations report a pattern of declining labor force participation akin to those of the high-development group – Egypt, Kazakhstan and Vietnam – all with rates below 20 per cent in the oldest group. Five additional nations have a pattern where the rate at age 65+ is at least half of the rate at ages 55–59 (and the absolute participation rate is less than 50 per cent after age 65+): Brazil, Peru, Russian Federation, South Africa and Turkey. Men's retirement appears to be less prevalent still in the remaining nations.

The same can certainly be said for the low-development nations in Table 21.2 where, based on the few countries reporting complete data by age and sex, at least three-quarters of men aged 65+ are still in the labor force, preponderantly in agriculture. To the extent that there are withdrawal and succession processes in these countries, they may occur later than in

high-development countries and the duration of any retirement stage would be shorter.

Women's age-related fall off in labor force participation generally parallels that of men (Fig. 21.1). Women and men tend to have access to the same pension rights, given comparable earnings and tenure. In some nations, such as Italy, Japan and the UK, women at times have even been offered the option of earlier statutory ages for retirement, the rationale being that wives are typically younger than husbands. Wives' earlier access to pensions allows the household to retire as one, i.e., a joint incentive to exit the labor force together.

Women at age 65+ have rates of labor force participation that are universally lower than those among men. Because women are more likely to have had work careers with intermittent or part-time employment or work within the household (and accordingly lower pensions or no pensions), one cannot readily conclude that nonactive women aged 65+ in Table 21.2 *have* retired. Nevertheless, they are still out of the labor force, occupying a retirement stage and supported or supporting themselves outside of the formal employment system. In a majority of high-development nations, women's labor force participation is less than 10 per cent; in the mid-development group rates at 65+ are somewhat higher but still lower than those among men.

Although women's rates of activity decline across age groups in Table 21.2, there has also been a historical increase in job holding among successive cohorts of mature women. The two offsetting trends – a greater likelihood of retirement at older ages and a greater likelihood of employment in younger cohorts – are confounded in cross-section. Instead of cross-sectional comparisons by age, analysts have used within-cohort comparisons across time to examine women's retirement patterns. For example, women aged 55–59 can be compared to women aged 60–64 at a point five years later in order to estimate a net withdrawal rate (OECD 1995). Results of such calculations for men and women alike have confirmed that women's rates of retirement pace those of men both in cross-section and over the last few decades (Ebbinghaus 2006; Hofäker and Pollnerová 2006).

Rates of labor force participation by age of the kind reported in Table 21.2 are, as noted earlier, an approximate measure of labor supply. Among older workers, participation rates tend to exaggerate labor

Table 21.3 Part-time employment as a percentage of total employment by sex and age, OECD member nations, 2005

	Men			Women		
	55 to 59	60 to 64	65+	55 to 59	60 to 64	65+
Australia	11.8	19.3	45.3	42.3	49.5	63.3
Austria	6.2	24.7		32.7	48.1	
Belgium	8.2	18.0		43.1	38.9	
Canada	7.9	14.9	35.0	26.8	35.3	58.5
Czech Republic	1.2	8.1	35.7	6.4	31.5	58.7
Denmark	6.3	11.7		19.5	30.9	
Finland	9.8	28.6		14.8	34.1	
France	8.4	14.1		28.0	35.9	
Germany	5.8	15.3		42.5	55.1	
Greece	2.5	3.0		11.2	11.4	
Hungary	3.0	12.3		7.5	29.7	
Ireland	9.3	11.1		46.1	51.6	
Italy	7.9	11.0		32.0	32.3	
Japan	11.6	27.4	43.6	45.1	53.9	56.9
South Korea	9.0	13.4	25.0	14.8	16.4	27.9
Luxembourg	3.4	6.3		39.6	41.8	
Netherlands	13.0	33.2		66.4	75.3	
New Zealand	5.9	14.1	37.3	34.4	42.9	61.0
Norway	4.8	13.2		35.2	39.4	
Poland	10.1	20.7	45.2	26.0	44.9	61.9
Portugal	5.5	12.4		24.4	31.6	
Slovak Republic	1.9	9.1	27.5	12.3	43.2	58.1
Spain	1.9	4.3		22.7	28.3	
Sweden	7.6	17.3		17.9	26.7	
Turkey	6.5	8.8	11.6	18.9	19.1	18.4
United Kingdom	10.2	20.4		43.3	62.2	
United States	3.9	10.3	32.2	13.0	20.1	45.4

Source: OECD Statistics (www.oecd.org/statsportal).

supply because what employment there is at these ages is progressively made up of part-time work. Table 21.3 reports for OECD member countries in 2005 the percentage of total employment in part-time work among retirement-age workers, defined as less than 30 hours in a usual week at the main job. Part-time work as a share of all work rises across age groups and is more common among women than men. The specific breakout of part-time work thus reveals that nations with earlier retirement staging have even less labor supply among persons in their 60s. The Netherlands, which in 2005 had already low rates of labor force participation at ages 60–64, also showed the highest rates of part-time employment in that age group. And nations with late-exit patterns, such as South Korea and Japan, also have sizeable

shares of employment in part-time work after age 60 and thus fewer working hours than the gross labor force participation rate would suggest.

The age-related shift toward part-time work, which also tends to include more self-employment, may stem from a number of factors: pension schemes that encourage partial retirement, as in Sweden; weak pension benefits that necessitate continued work, as might be more likely in the U.S.; a labor market that accommodates re-employment after exit from career jobs, as in Japan; or an economy that under-employs its oldest workers. Taking the example of the Netherlands, whereas the universal state pension is available at age 65, a set of pathways – non-governmental pension plans, unemployment insurance, disability insurance – has made earlier exit the norm (Henkens and Kalmijn

2006). The high proportion of part-time employment (33 per cent) among men still in the labor force after age 60 reflects partial, pensioned exit schemes rather than a pattern of part-time re-employment after retirement (de Vroom 2004). As for women, Dutch society has favored a breadwinner model that idealizes employment for males and child rearing and caregiving for females. While this is changing and women are increasingly employed, they tend to work part-time (Henkens, Grift and Siegers 2002). Table 21.3 shows the large majority of Dutch women in part-time employment after age 55.

A Trend Reversed ?

The age-graded pattern of labor force activity displayed in Table 21.2 is contemporary, circa 2005 and illustrates the penetration of a retirement stage into the later course of life. However, this is a present culmination of a remarkable turn of events in the evolution of retirement practices within industrialized nations. The 20th century trend toward retirement at ever younger ages has steadied and begun to reverse itself, heralding perhaps a new era of prolonged work lives. That the timing of retirement may flow historically one way and then another should not in itself be surprising, given retirement's function as an instrument for institutional and individual interests.

Economic development propelled a long-term trend across the 20th century that saw higher proportions of older adults exit the labor force at earlier ages (Costa 1998). This exiting accelerated, however, beginning in the last few decades of the century (Hofäker and Pollnerová 2006; Jacobs et al. 1991). Table 21.4 reports labor force status in OECD nations across the period 1975 thru 2005 for men aged 60–64 and 65+ and likewise for women at these ages. These two age categories flank the most common statutory age (65) for public pensions and allow an examination of the flow toward and away from early retirement. “Early” in this sense is named in relation to age 65, though early retirement can be defined in relation to other age or job-specific norms.

In all of the nations for which there is an OECD data series from 1975 to 1990, the labor force participation for men dropped off over the 15 years and within

both age groups, sharply in some cases. By 1990, half of the nations with reported data had participation rates of 50 per cent or less at ages 60–64 and rates of 10 per cent or less above age 65. The lowest rates by 1990 (less than 25 per cent at ages 60–64) were seen in a cluster of Western European nations: Belgium, France, Luxembourg and the Netherlands. Japan, by contrast, had the largest share of men working at 60–64 and the decline from 1975 to 1990 had been slight, from 79–73 per cent. For all nations, the reduction of men's labor supply at older ages is even more pronounced when one remembers (Table 21.3) that the prevalence of part-time work rises with age. The trend for women, again, is confounded with the historical rise in job holding across this period. What can be observed about women is that in 1990 the majority of nations had quite a small (less than 5 per cent) representation of females in the labor force above the age of 65.

Ever earlier retirement across the postwar period can be understood with reference to the structural factors that shape labor supply: state systems of social protection, the labor market and life course expectations (Guillemard and Rein 1993; Kohli et al. 1991). As to the first, economic growth, rising wealth and favorable ratios of younger to older workers all allowed nations to expand income security programs for old age, particularly the worker-to-retiree income transfers inherent in pay-as-you-go social insurance schemes. More workers were covered with higher benefit levels and statutory ages for pension receipt were lowered. Such incentives for retirement were sometimes paired with early retirement provisions from tax-advantaged occupational pensions. On the European continent, other forms of welfare protection for mid-life workers, namely unemployment insurance and disability protections, created pre-pension pathways to labor force exit (Guillemard and van Gunsteren 1991). All of these measures promoted turnover in the labor market to the advantage of younger job seekers and also reduced labor supply in times of unemployment.

Nation by nation, such arrangements were the outcome of negotiations among the social partners: the state, employers and labor unions. National traditions of partnership (e.g. cooperative versus contentious) were particular contexts for bargaining and policy (Ebbinghaus 2006). Employers, for their part, had reasons to superannuate older workers. In employment systems with long-term contracts that honor senior-

Table 21.4 Labor force participation rates, 1975 to 2005, in OECD nations, by age and sex

	Age 60–64							Age 65+						
	1975	1980	1985	1990	1995	2000	2005	1975	1980	1985	1990	1995	2000	2005
MEN														
Australia		51.5	43.8	50.6	46.8	46.6	54.7		11.2	9.1	9.2	9.6	10.0	11.6
Austria					20.3	17.3	20.2					5.5	4.3	5.0
Belgium			26.9	19.3	18.6	18.8	25.1			2.6	1.9	2.3	2.2	2.2
Canada		63.9	55.7	50.9	43.4	45.8	53.9		13.2	11.8	10.8	9.9	9.5	12.1
Czech Rep.					28.0	24.5	34.4					9.1	6.8	6.3
Denmark			47.2	51.2	50.8	39.3	48.7			13.2	13.0	4.7	3.9	9.4
Finland	56.1	42.5	37.5	29.9	23.5	28.3	37.0	29.4	17.0	10.6	9.2	5.6	6.3	7.3
France	56.8	47.9	30.8	22.8	17.0	15.5	18.5	14.0	8.4	5.3	3.7	2.5	1.9	1.7
Germany	58.4	44.3	33.3	33.6	28.4	30.2	40.7	10.6	6.8	5.1	4.7	4.2	4.4	5.1
Greece			54.5	46.0	47.4	45.2	44.9			15.0	11.8	11.7	8.4	6.9
Hungary					11.9	11.9	21.3					3.7	3.9	4.2
Iceland					89.9	91.9	86.3					34.6	29.0	25.2
Ireland					54.9	53.7	60.0	28.2		16.3	16.4	15.3	14.7	14.6
Italy	42.4	39.6	38.6	36.0	31.3	31.4	28.9	10.4	12.6	8.4	7.1	6.4	5.8	6.0
Japan	79.4	77.8	72.5	72.9	74.9	72.6	70.3	44.4	41.0	37.0	36.5	37.3	34.1	29.4
South Korea				67.2	73.7	63.6	66.7		45.2	44.2	39.3	40.9	40.6	41.2
Luxembourg			18.6	23.1	14.8	16.5	14.9			5.3	3.5	2.6	2.3	1.0
Mexico					72.9	73.7	71.4					51.9	50.0	46.4
Netherlands	64.9	48.8	27.8	22.7	20.5	27.2	30.7	8.0	4.8	3.5		5.4	5.5	7.3
New Zealand				35.0	47.3	60.1	71.1				10.4	9.8	11.8	16.2
Norway	76.9	73.4	71.3	64.2	62.5	60.6	64.1	37.6	34.3	26.4	25.0	15.3	14.2	17.4
Poland					33.7	29.7	27.7					16.1	12.4	9.3
Portugal	73.8	66.0	58.3	56.8	51.0	55.4	49.5	37.7	28.1	20.2	19.8	23.6	25.0	24.6
Slovak Rep.					13.1	10.6	22.0					3.0	2.0	2.4
Spain	71.5	63.9	54.3	46.9	40.6	43.3	48.8	18.8	12.7	6.1	3.8	3.0	2.6	3.2
Sweden	74.0	69.2	65.3	63.6	57.4	56.7	65.5	19.9	14.3	11.2	12.6	13.9	15.0	14.6
Switzerland					71.4	64.1	64.7					20.1	20.3	11.1
Turkey				54.8	55.3	47.8	40.2				30.9	33.0	32.5	24.2
UK			55.4	54.4	50.1	50.2	55.5			8.5	8.8	8.2	7.8	9.2
United States	65.5	60.8	55.6	55.5	53.2	55.0	58.0	21.6	19.0	15.8	16.3	16.8	17.7	19.8
WOMEN														
Australia		13.4	11.9	16.0	16.4	21.8	31.2		2.8	2.1	2.4	2.6	3.1	4.2
Austria					9.8	8.0	8.3					2.4	1.6	1.7
Belgium			5.4	4.0	5.4	7.1	10.9			0.9	0.6	1.0	1.1	0.8
Canada		25.0	24.1	24.2	23.4	27.0	35.0		3.9	4.1	3.6	3.4	3.3	5.0
Czech Rep.					13.3	11.9	12.9					3.4	2.4	2.3
Denmark			26.5	28.3	21.6	23.7	27.2			3.2	3.4	0.9	1.6	2.4
Finland	27.8	27.9	31.9	21.2	18.3	21.6	32.4	8.5	5.6	4.8	3.4	2.0	1.6	3.2
France	30.0	27.6	18.8	17.0	14.4	13.5	16.7	5.8	3.4	2.2	1.5	1.2	0.9	0.9
Germany	15.8	12.5	10.1	10.4	10.2	13.3	22.9	4.6	3.2	2.3	2.2	1.6	1.5	2.2
Greece			21.4	19.9	20.2	20.5	20.6			5.4	4.5	3.7	2.7	1.9
Hungary					4.8	5.0	9.9					1.7	1.8	1.5
Iceland					81.1	72.6	75.2					17.4	12.0	10.9
Ireland					15.4	19.5	28.2	7.2		3.9	3.4	3.0	2.9	3.3
Italy	8.5	11.0	10.2	10.1	7.8	8.0	9.4	2.1	3.5	2.1	2.2	1.8	1.6	1.1

Table 21.4 (continued)

	Age 60–64							Age 65+						
	1975	1980	1985	1990	1995	2000	2005	1975	1980	1985	1990	1995	2000	2005
Japan	38.0	38.8	38.5	39.5	39.7	39.5	40.1	15.3	15.5	15.5	16.2	15.6	14.4	12.7
South Korea				43.5	45.9	46.1	43.3		16.9	19.2	18.4	20.2	22.8	22.5
Luxembourg			8.9	9.5	8.2	12.5	11.0			2.0	1.1	1.1	1.2	0.4
Mexico					24.8	23.6	25.9					14.7	14.5	14.5
Netherlands	10.8	9.5	6.3	7.8	8.2	11.2	18.0	1.8	0.9	0.6		0.9	1.5	1.9
New Zealand				16.8	23.6	33.7	50.2				3.6	3.0	4.4	7.9
Norway	40.0	40.2	45.7	46.5	47.7	48.4	51.8	12.1	12.7	13.6	12.0	9.0	8.5	11.5
Poland					19.7	16.3	14.0					8.5	5.2	3.9
Portugal	27.8	27.0	26.1	24.6	26.3	35.9	37.9	10.7	8.6	7.8	7.7	11.3	13.3	13.2
Slovak Rep.					4.4	3.4	7.6					0.9	0.6	0.9
Spain	19.7	17.3	16.0	15.7	15.2	16.6	20.4	6.3	4.0	2.3	1.7	1.4	1.0	1.1
Sweden	38.3	41.2	46.9	53.4	48.6	48.6	57.1	6.1	3.8	2.9	5.1	5.3	6.3	5.9
Switzerland					30.6	34.2	42.8					10.0	9.7	4.8
Turkey				22.2	21.9	18.6	15.3				9.3	11.0	11.3	7.6
UK			18.8	22.7	24.9	25.9	31.0			3.0	3.4	3.2	3.4	4.3
United States	33.2	33.2	33.4	35.5	38.0	40.2	45.8	8.2	8.1	7.3	8.6	8.8	9.4	11.5

Source: OECD Statistics (www.oecd.org/statsportal).

ity and protect career workers, older employees can eventually become costly relative to their presumed productivity. Firms in changing industries would also seek to adjust the age structure of their workforces in order to stock them with younger workers receiving lower wages and, arguably, more amenable to new work methods and schooled in new technologies. The rising unemployment that accompanied the global oil crisis of the 1970s only accentuated the favor for mechanisms to shed older workers. Earlier retirement was an orderly way to replace older personnel. Unions and works councils consented to retirement rules, occupational pensions, buyouts and augmented health insurance as an acceptable means of protecting older members and managing succession in union ranks.

Culturally, rising rates of retirement, indeed, the democratization of the practice, opened a space in people's imagination between the adult role of work and the relative poverty and disability that had characterized old age. Retirement as a period of pensioned leisure now beckoned older workers, its image burnished in part by industries that emerged to sell them goods, services and lifestyles (Blaikie 1999; Inkeles and Usui 1988). The early retirement trend, thus, was advanced by the pull of pension incentives and the promise of leisure, along with a push from the labor market's disfavor for older workers. There were extensive cross-national

variations in the contribution of the push-pull components to the early retirement trend, though some authors detect common patterns among welfare state regimes (e.g. Blossfeld, Buchholz and Hofäker 2006; Ebbinghaus 2006; Esping-Andersen and Sonnberger 1991).

The halt in this trend, where it occurred and the beginning of a reversal began in the 1980s with a broad recognition of new demographic realities. Rising life expectancy and declining fertility were bound to strain state systems of social insurance that taxed the working age population to support a retirement stage. Nations with low fertility also foresaw potential reductions in the size of the working age population even as their labor markets had absorbed new female workers. Delays in retirement, if possible to achieve, would not only reduce social expenditures but also retain older workers as taxpayers. The eventual shift away from earlier retirement can be seen from a further examination of Table 21.4, considering experience in OECD nations from 1990 or 1995 up to 2005.

Among men aged 60–64, half of the nations now reported increases in labor force participation; two-thirds altogether reported stable or increased rates. More than half also saw rises in work activity above age 65. Patterns for women at these ages (with the caveat about secular change in job holding) tracked those of men. In addition, the fact that rates for men

and women in both age groups also trended together in many nations suggests that national policy influenced the new direction. For example, rates rose since the 1990s for all groups in Australia, Canada, New Zealand and the United States; rates were stable in Mexico and Korea; and rates continued to trend toward early retirement in Italy and in Japan, although in the latter case from a high baseline.

What accounts for this new pattern? Chiefly, it has been government efforts to discourage early exit (OECD 2000). As an example of this new direction, the Commission of the European Communities (2004) set targets for raising employment at ages 55–64 and declared that “a progressive increase of about 5 years in the effective average age at which people stop working in the European Union should be sought by 2010” (p. 3). In outline, several strategies are available for this purpose.

A primary strategy is to cut back on early access to public pensions by raising ages of eligibility, reducing benefits at early ages and rewarding delayed exits and withdrawing offers of pension receipt that are earlier for women than men (Myles 2002). Simulations reported in Gruber and Wise (2004) suggested that later retirement ages might have large effects on labor force participation rates. As another strategy, a portion of guaranteed defined benefit pensions might be replaced by the less predictable returns from privatized personal accounts. Other incentives for early exit can be closed off by tightening unemployment and disability programs, especially those that had been expanded to deal with the cyclical unemployment of the 1980s and 1990s. It should be noted that the political will for such retrenchment is not easily found among the social actors who forge such policy (Bonoli and Shinkawa 2005). In addition, reforms must be concerted across all the income support mechanisms lest workers merely substitute one early-exit pathway for another.

In tandem with restraining the pull of social protection programs, governments can also address labor market features that push older workers from the labor force. They can engage with employers and unions to create a supportive environment for older workers – a new culture that views them not as expendable but as valued resources. States can act to curtail legal and de facto age discrimination in such matters as hiring, compensation, staff reductions and job assignments (Macnicol 2006). Firms can be encouraged to use job shifting and other adaptations to manage changes in workers’ limitations. Wage schemes that favor senior-

ity can be evaluated so as not to price older job seekers out of the market. Flexible retirement arrangements are another way to retain older workers, integrating partial pensions with part-time work. Finally, firms can be encouraged to invest in training and lifelong learning that updates the skills of older workers. Early exit may be a boon to older workers but it also creates a culture that fails to invest in their employability.

Governmental appeals to employers and unions for “active aging” practices toward retirement-age workers are couched in the rhetoric of human capital (OECD 2000). The European Union report (CEC 2004) urges that such workers be regarded as core resources whose premature retirement “represents a waste of individual life opportunities and societal potential” (p. 3). Together with the demographic rationales for later retirement – fiscal pressures on social security and looming labor market shortages – the human potential of older workers is yet another argument for prolonging work, all made with an eye to improving prospects for national economic growth and sustaining tax revenue.

If retreats from social welfare might shift the age of retirement, so can two forms of retreat from corporate welfare on the part of firms that are under pressure to remain competitive and profitable. First, the organizational restructuring and downsizing that began in the 1980s in industrialized economies have left fewer mature workers sheltered within the closed employment systems typically seen in large bureaucracies and government civil service. While employed in career jobs, such employees would be protected from labor market competition, rewarded with rising wages and employers’ pensions and eventually channeled out, often at early ages, by retirement rules (Sørensen 1998). In employment structures with shorter labor contracts, older workers compete for jobs with others, including workers from the global labor market (Harrison 1994; Sennett 1998). Here they are more vulnerable to judgments about their productivity, qualifications and skills; wages are more likely to plateau in middle age. With employment less secure, these workers can be expected to welcome their eligibility for pension receipt but some might be expected to delay retirement out of the necessity to accumulate more income. The possible advantage of open structures is that they may provide workers with opportunities for reemployment in part-time and bridge jobs on the way to the exit (Doeringer 1990; Quinn 1999).

A second retreat from corporate welfare is the privatization of earnings-related occupational pensions. In a number of nations, there has been a shift in the dominant type of pension, from the defined-benefit type with its guaranteed income and centralized management of funds to the defined-contribution type that relies on individually managed accounts with more variable results for retirement saving (Munnell and Sunden 2004). This turn from corporate paternalism to employee self-reliance puts greater responsibility on the individual. Another feature of traditional defined-benefit pensions is that they carry strong age-incentives for retirement (Hutchens 1994), whereas defined-contribution schemes do not require that one exit work in order to access the proceeds. (In another retreat from corporate welfare specific to the U.S., firms have steadily withdrawn health insurance subsidies to retirees both before and after their eligibility for the public Medicare program at age 65.) Account-type pensions, together with job instability from organizational restructuring, make the chances of accumulating retirement savings less secure. This transfer of risk from employers to individuals leaves financial prospects for retirement less certain, particularly for workers with less education and fewer skills (Hacker 2006).

State interests in delaying retirement are bound to encounter resistance from employers who still have incentives to shed older workers. The call for later retirement will also clash with the expectations of those same workers and their labor representatives who have passed the preceding decades in work cultures that foresaw early retirement as desirable. It will not be easy to reorient the early-exit cultures into which workers have been socialized and view as an earned right (Myles and Pierson 2001). Evolving national retirement arrangements reflect these cross currents – government restraint on retirement spending, labor markets unsupportive of older workers and popular favor for pensioned leisure as a social right – and some national examples illustrate how this has played out.

Italy is the largest nation among a group of Southern European, conservative welfare states, including Greece, Portugal and Spain that have relied heavily on generous public pensions for financing retirement. Italy today has a high level of early retirement with the most expensive program in Europe and reforms have yet to reverse the long-term trend in older citizens' labor supply (Brugiavini and Peracchi 2004). With a tradition of strong employment protection, especially

for older males in larger firms, the Italian system has countenanced a diverse set of mechanisms for facilitating early exit in order to peacefully shed older workers in the face of economic downturns and organizational restructuring (Beckstette et al. 2006). The public pension scheme, while not standardized as to access ages and contributory rules, has had low eligibility ages and its high replacement rates – 75–80 per cent for a typical worker – have discouraged continued work. In addition, temporary unemployment programs, early retirement pensions and disability programs have been used to bridge the time to retirement age. Faced with a pension funding crisis in the early 1990s, Italy entered a period of continuous reforms but attempts to retrench have met political resistance, particularly from labor unions eager to preserve the pension rights of older members (Franco 2002). Political and social compromises have nonetheless launched restrictive reforms whose phase-in will not be completed for decades. These include raising the pensionable retirement age to 65 for most men and women, a stronger link between contributions and benefits, higher pension amounts for delayed retirement and a new scheme of supplemental occupational pensions. Active labor market policies, however, are not yet a prominent part of the Italian policy mix (Ferrera 2006).

In the history of retirement, Germany has the distinction of having pioneered the first national workers' pensions in the late 19th century. Today Germans retire at ages on average in between those of the early-exit and late-exit cultures referenced elsewhere in this chapter but against the standard of age 65, they still retire early. The country's retirement picture is best understood within Germany's institutional context as a Continental conservative welfare state (Ebbinghaus 2006). There is a highly regulated employment system that features cooperative labor relations, legal protections for seniority, closed occupational structures with low job mobility and limited reliance on requalification and reemployment when mature workers become redundant. In such a regime, early retirement represents a socially acceptable way to accomplish staffing reductions when firms come under pressure to downsize or industries decline. There are multiple pathways to retirement, all financed by a public pension system that essentially has a single pillar (Buchholz 2006; Teipen and Kohli 2004). Mandatory public retirement insurance is a pay-as-you-go system supported by employer and employee contributions and

other revenues. Its multiple mechanisms altogether provide a generous replacement of income and also support health insurance for retirees. There is an old age pension claimable at age 65 for men (age 60 for many women but also rising to 65) but only a minority of workers actually remain employed up to that age threshold. Several early-out pathways are available, including an early seniority pension, disability pensions and unemployment compensation. Germans have shown little enthusiasm for partial pensions and there is minimal post-retirement employment. Occupational pensions are limited and they supplement state pensions but do not drive retirement timing. Joining the common European reform climate, later ages for public pensions of all types will be phasing in. A long-term reduction in replacement rates from about 70–60 per cent is scheduled for public pensions, with the shortfall to be made up by new voluntary occupational pensions that will be tax qualified.

Sweden's levels of labor force participation at ages 55–64 are above European Union targets for achieving later average retirement (CEC 2004) but there is also a sharp drop-off in labor supply after age 65 for men and women. This pattern arises from a number of aspects of the Swedish policy landscape (Anderson 2005; Palme and Svensson 2004). First, both public and occupational pensions concertedly feature a full-benefit age at 65. The public old age pension scheme has a basic and an earnings-related benefit, the latter administered according to defined contribution principles following a major reform in the late 1990s. Another set of supplementary occupational pensions covers almost all of the labor force. These differ by occupational sector and are the outcome of collective agreements between unions and employers' representatives. Again, the common feature of all these devices is a normal, full-benefit age of 65. Workers may claim them earlier (at 60 or 61) but with an actuarial reduction or delay them with an increment. Second, Sweden has legislated strong employment protection against layoffs and dismissals but this ceases at age 65, as does the option for any unemployment benefits. Most government workers also incur mandatory retirement at age 65. Third, there are limited early-exit pathways. A special combination of unemployment and disability benefits and a partial pension program had formerly financed early retirements but these avenues had been withdrawn by the end of the 1990s. Fourth and consistent with other Scandinavian social-democratic

states, Sweden favors a "work principle" that aims for the re-integration rather than the exit of marginalized workers. This extends to collective agreements for manpower programs for job training, restoration of skills and reassignment (Wadensjö 2002). Consistent with the work principle, recent reforms will go even further toward incentives for continued work. The permissible mandatory retirement age will rise from 65–67 and a new public pension system is phasing in that will base benefits on lifetime earnings (rather than the best 15 years) and require 30 years of employment for a full pension (Lindquist 2006).

The United Kingdom also has relatively high employment at ages 55–64, with over half of the population remaining employed until the statutory retirement age of 60 for women and 65 for men. The retirement pattern in the UK exemplifies those of other Anglophone liberal-residual welfare states (Australia, Canada, Ireland, New Zealand, the U.S.) that hew to free-market principles for managing retirement. These policy elements, allowing national variations, include less generous state pensions, greater reliance on occupational pensions, less labor market regulation and employment protection for older workers, open employment systems with greater job mobility and more individual risk and responsibility in retirement saving (Golsch et al. 2006). By the mid-1990s Britain had already realigned its retirement policy to address the trend toward increasing pension expenditures and early retirement, essentially by reducing benefits in the state pension and encouraging the formation of occupational pensions and personal (individual account) pensions (Blundell and Johnson 1999). Britons can access a basic state pension at 60 (women) or 65 (men); for those without sufficient contributions, a means-tested minimum-income benefit is available. Earlier retirement can be financed with an occupational pension (increasingly of the defined-contribution type), though these are not universal and more likely to help the retirement of white-collar workers. The other early-exit pathway is an invalidity benefit that has stringent requirements about long-term sickness or disability. Unemployment benefits are only temporary. The concern for the future is not so much an early-exit trend, as in continental Europe but the observation that occupational and private pension schemes will not fill the income gap created by smaller state pensions, especially among women who have lower lifetime contributions. Projected inadequacies in retirement income will have to be met with measures to encourage later

work (the female retirement age is set to rise to 65 by 2020), viable occupational pensions, greater individual savings and efforts to reduce age bias and labor market barriers for older workers (Clark 2006; Taylor 2004).

Japan is also among the group of liberal-residual welfare states that has a low availability of early-exit pathways but in practice different from the Anglo-phone countries. Japanese workers, especially men, remain in the labor force longer than in most OECD nations. This is an apparent paradox because the larger firms in Japan enforce mandatory retirement at age 60. The public pension scheme has two tiers: a flat-rate pension for all citizens beginning at age 65 regardless of employment and an earnings-related pension available to most workers beginning at age 60. If individuals continue to work after 60, the pension is reduced relative to earnings. Unemployment and disability insurance have strict criteria and are quite limited as exit pathways in Japan (Oshio and Oishi 2004). Large firms in the primary labor market, which encompasses about one-third of workers (mostly male), offer seniority protection and career employment to workers but then oblige mandatory dismissal at age 60. Workers may receive occupational pensions in return for dismissal and the firm may re-employ them on a reduced basis or in some other sector. Across the labor force, thus, there are disincentives for full-time work after age 60 but insufficient pension income from public and/or private schemes to support full retirement until age 65 (Williamson and Higo 2006). Financial readiness for exit is even more reduced among workers in the secondary labor market and among women with limited earnings histories. The system overall channels workers into a form of gradual retirement marked by partial pensions and downmarket work with reduced earnings. This gradual retirement is abetted by corporate welfare (the re-employment system) and by a cultural value (*ikigai*) that favors productive engagement in work, especially for men. Facing a rising pension burden, reform measures will raise both the mandatory age and the eligibility age for the early public pensions to 65 from age 60 in the coming years (Kimura and Oka 2001). The Japanese government has committed to an active role in supporting skills programs for older workers. The question for the future is whether employers will continue to offer the jobs that underpin partial exit after age 60, even with promised government subsidies.

Compared to the affluent economies addressed in the preceding national vignettes, the issue in low-income economies is not the reform and retrenchment of expansive pensions but rather their implementation. Calvo and Williamson (2008) summarized experience in Latin American countries where the prevailing pension reform has been a shift from pay-as-you-go defined benefit models to systems of mandatory individual retirement accounts. In the eight nations considered by the authors – Argentina, Bolivia, Chile, Colombia, El Salvador, Mexico, Peru and Uruguay – the pension systems are challenged in a number of ways. There are high transition costs as nations phase in privatized accounts to replace defined benefits. For most of the countries, coverage of the workforce is partial, with a high of about 60 per cent of the workforce covered as contributors in Chile. Another multination analysis found a weighted average of only 27 per cent of workers covered by public pensions in the region (Mesa-Lago 2005). Compliance is also partial, with only about half of enrolled contributors managing monthly contributions. Rather than pay into retirement accounts, it may seem especially to rural and low-wage workers that a more rational strategy for economic security is investment in housing or children's education. Contributors may also be wary about the potential for the political manipulation of funds.

China's retirement profile in the 21st century will be a secondary consequence of that nation's strong move to control population growth a generation ago. The stark one-child birth policy portends accelerated population aging with two implications for old-age provision: a reduced number of contributors relative to beneficiaries in the public pension program, along with a threat to the tradition of family support for elders.

In the late 1990s China committed itself to a two-tier public pension system that included a scaled-back social insurance benefit along with personal retirement accounts. This would eventually be the world's largest pension scheme but there are several hurdles to overcome. Current pension obligations to retirees from the declining number of state-owned enterprises are presently unfunded. Coverage of workers by the new system is fragmented: 55 per cent of urban private and government employees and only 11 per cent of the rural workforce (Jackson and Howe 2004). Evasion and resistance to participation are laid to the high contribution costs, government inability to enforce compliance in small businesses, limited portability of

entitlements, low public trust in the system and other administrative difficulties (Salditt et al. 2007). It is impractical to raise retirement ages (50 for women and 55 for men in blue collar jobs) because there is an urban labor glut due to migration from the rural countryside. Chinese workers without pension coverage might count on the traditional form of social security – the family. Elders with lesser means tend to live with their adult children whose filial piety can also extend to financial support. The one-child policy, however, promises a “4-2-1 problem” – one adult child potentially responsible for two parents and four grandparents. Moreover, the migration of younger adults away from the rural areas will reduce the availability of family caregivers. The Chinese have a habit of personal saving but most of this is housing wealth. Occupational pensions are still limited. China currently has a favorable total dependency ratio but in 20 years population aging will increase sharply. The challenge in the meantime will be the implementation of the public pension program and assurance of its fiscal integrity.

In Nigeria, Africa’s most populous country, the democratization of retirement by means of national pensions has yet to occur. Nigeria has a small share of its population at retirement age – 4.8 per cent aged 60 and older – and it ranks low (161st of 192 nations) in world population aging (United Nations 2007). Employment levels are high in later life. The agricultural sector employs 60–70 per cent of Nigerians, almost none covered by any pension. For those private sector and government workers enrolled in pension schemes, the retirement age has ranged from 50–60 but many eligibles work beyond these ages out of economic necessity. The traditional pillar of old age support – social welfare provision by family and kin – has been weakened by migration to cities, emigration abroad, poverty and HIV/AIDS. By the turn of the new century, the defined benefit pension system intended for private sector and self-employed workers had failed. Contributions and benefits alike were inadequate and there were high rates of evasion. Coverage was low – only 12 per cent of the economically active population (World Bank 2000). In addition, non-contributory schemes promising pensions for government workers were largely underfunded. Occupational (company-sponsored) pensions covered only a small fraction of workers. For those already retired, pension payments were erratic and news accounts frequently

reported non-payment and hardship for pensioners from all sectors, including the military.

Nigeria’s recent reform effort, enacted in 2004, instituted a mandatory defined contribution scheme modeled on the Chilean system. For workers in federal service and in the private sector (businesses with five or more workers), employees and employers will both contribute to individual “retirement savings accounts” that will be overseen by a national pension commission. That body will also absorb the entitlements of the old system and regulate private pensions as well. This new consolidated pension administration will co-exist with the old defined benefit scheme and its continuing (and still unfunded) obligations to current retirees. There are numerous questions about the new pension regime and its implementation (Orifowomo 2006). Can coverage, for example, be extended to the economy’s considerable number of contingent (“casual”) workers? Can the pension rolls be purged of so-called ghost workers? Are Nigerians workers equal to the responsibility of directing their own retirement accounts? Nigerian unions harbor suspicions that their contributions will be diverted to fund public sector retirees. Altogether, the development of a basic retirement guarantee under this new legislation will depend on administrative transparency and government commitment.

Implications of a Retirement Stage

This chapter concludes by turning briefly to consider retired populations not as a dependent variable – as the outcome of political and economic arrangements, cultural habits and individual decision making – but rather as an independent variable – as a status with implications for other social institutions. Retirement practices segment the life course by creating a post-retirement stage potentially untethered to the work- and family-centered involvements of adulthood. This stage lasts until death (if adopting a tripartite division of life into successive stretches of education, work and leisure) or until the onset of frailty (if naming a vital “third age” prior to the “fourth age” of disability at the end of life [Laslett 1989]). The span of this stage and its demographic weight depend on the average age of retirement and the extent of (active) life expectancy.

The meaning of the retirement stage, like the practices that enable it, is a continuous construction of its occupants, observers and stakeholders.

Accordingly, the population of retirees may be variously regarded as:

1. A category of economic dependents. This is the implicit view of retirement as discussed throughout the preceding section, where the pensioned leisure of older workers renders them an expense in government budgets and an object of world-wide concern under conditions of population aging. In poorer economies, the dependency of those formerly at work falls more on the family.
2. Occupants of a separate social role. Unless filled in with specific content, retirement tends to be a “roleless” or “ex-” role (Burgess 1960; Ebaugh 1988). A vague social role may be entirely appropriate and protective for those who have withdrawn, requiring only their noninterference in the affairs of their former position.
3. A resource for family. The superannuated elderly can redeem family dependency by becoming carers for children and other kin or by contributing labor to family enterprises. Even if not dependent, their voluntary assistance can support the labor of adult children who have their own families.
4. Migrants. Unobliged to daily schedules, retirees can come and go geographically. They can redistribute and concentrate themselves to the advantage or disadvantage of locales (Serow 2003). Despite the mixed economic and social service impacts from retirement migration, regions nevertheless compete to be retirement destinations by using amenities and tax policies (Duncome, Robbins and Wolf 2003).
5. A market. Retirees constitute a population segment of special commercial interest to numerous industries, notably housing, financial services, leisure and travel, fitness and self-care but also a host of other consumer goods. Before their incomes are eroded by inflation or health-care costs, the newly pensioned can be a lucrative business opportunity (Moschis and Mathur 2007).
6. An imaginative “field.” Out of their activities, discourse and generational experiences, retirees can form a self-conscious solidarity about their stage of life (Gilleard and Higgs 2005). From without, retirement can also function as an aspirational

object, shown as desirable by marketers as well as institutions that want to motivate saving for retirement (Ekerdt 2004).

7. A political interest group. Retirees can organize themselves to assert their economic and welfare interests, or they can be recruited as the clientele of political groups seeking electoral advantage, cleaving off elders’ interests from those of younger citizens (Hudson 2005).
8. A health interest group. Likewise, the pursuit of longevity and maintenance of independence may at once be the project of the retired population itself, or the object of public health, medical interests, or health care industries (Katz and Marshall 2003).
9. A community resource. Parties with civic interests sometimes stress the moral obligation of retirees to remain engaged in community affairs by volunteering in schools, churches and local organizations (Martinson and Minkler 2006). Such efforts protect the retirement stage against judgments that it is a time of dependence or self-indulgence.
10. A marginalized “other.” The retired population can embody what is feared about longevity – decay, estrangement, senility, loss of status – and so become an object unwanted and even one of derision. It is this sort of ageism that Gullette (2007) detected in contemporary Shakespearean stage directors who would have the audience side against the formerly sympathetic figure of King Lear as he retires and is cast out.

Retirement is ultimately a societal use of increased life expectancy. How it is organized and what it means is an ever-changing resolution for the disposition of extra years: for labor or leisure, for social benefit or burden, for excusal or engagement, for rights or responsibilities, for life course segregation or continued integration.

Acknowledgement The author acknowledges the assistance of Jebel Wilson in the preparation of this chapter.

References

- Anderson KM (2005) Pension reform in Sweden: Radical reform in a mature pension system. In: Bonoli G, Shinkawa T (eds) *Ageing and pension reform around the world*, Elgar Edward, Cheltenham, UK, pp 94–115

- Baltes PB, Baltes MM (1990) Psychological perspectives on successful aging: The model of selective optimization with compensation. In: Baltes PB, Baltes MM (eds) *Successful aging: Perspectives from the behavioral sciences*, Cambridge University Press, New York, pp 1–34
- Beckstette W, Lucchini M, Schizzerotto A (2006) Men's late career and career exits in Italy. In: Blossfeld H-P, Buchholz S, Hofäker D (eds) *Globalization, uncertainty and late careers in society*, Routledge, New York, pp 101–118
- Blaikie A (1999) *Aging and popular culture*. Cambridge University Press, New York
- Blossfeld H-P, Buchholz S, Hofäker D (eds) (2006) *Globalization, uncertainty and late careers in society*. Routledge, New York
- Blundell R, Johnson P (1999) Pensions and retirement in the UK. In: Gruber J, Wise DA (eds) *Social security and retirement around the world*, University of Chicago Press, Chicago, pp 403–436
- Bonoli G, Shinkawa T (2005) Population ageing and the logics of pension reform in Western Europe, East Asia and North America. In: Bonoli G, Shinkawa T (eds) *Ageing and pension reform around the world*, Edward Elgar, Cheltenham, UK, pp 1–23
- Brugiavini A, Peracchi F (2004) Micro-modeling of retirement behavior in Italy. In: Gruber J, Wise DA (eds) *Social security programs and retirement around the world: Micro-estimation*, University of Chicago Press, Chicago, pp 345–398
- Buchholz S (2006) Men's late careers and career exits in West Germany. In: Blossfeld H-P, Buchholz S, Hofäker D (eds) *Globalization, uncertainty and late careers in society*, Routledge, New York, pp 55–78
- Burgess EW (1960) Aging in western culture. In: Burgess EW (ed) *Aging in western societies*, University of Chicago Press, Chicago, pp 3–28
- Calvo E, Williamson JB (2008) Old-age pension reform and modernization pathways: Lessons from China for Latin America. *J Aging Stud* 22(1)
- Clark GL (2006) The UK occupational pension system in crisis. In: Pemberton H, Thane P, Whiteside N (eds) *Britain's pension crisis: History and policy*. Oxford University Press, New York, pp 145–169
- Commission of the European Communities (2004) Increasing the employment of older workers and delaying the exit from the labour market. http://ec.europa.eu/employment_social/employment_analysis/docs/age_com_2004_146_en.pdf
- Costa DL (1998) *The evolution of retirement: An American economic history*. University of Chicago Press, Chicago
- Dannefer D, Uhlenberg P (1999) Paths of the life course: A typology. In: Bengtson VL, Schaie KW (eds) *Handbook of theories of aging*, Springer, New York, pp 306–326
- De Vroom B (2004) The shift from early to late exit: Changing institutional conditions and individual preferences: The case of the Netherlands. In: Maltby T, de Vroom B, Mirabile ML, Øverbye E (eds) *Ageing and the transition to retirement: A comparative analysis of European welfare states*, Ashgate, Burlington, VT, pp 120–153
- Disney R, Grundy E, Johnson P (eds) (1997) *The dynamics of retirement: Analyses of the retirement surveys*. Department of Social Security, Research Report No. 72. London: HSMO
- Doeringer PB (ed) (1990) *Bridges to retirement: Older workers in a changing labor market*. ILR Press, Ithaca, NY
- Donahue W, Orbach HL, Pollak O (1960) Retirement: The emerging social pattern. In: Tibbitts C (ed) *Handbook of social gerontology: Societal aspects of aging*, University of Chicago Press, Chicago, pp 330–406
- Duncome W, Robbins M, Wolf DA (2003) Place characteristics and retirement location choice among the retirement-age population. *J Gerontol: Soc Sci* 58B:S244–S252
- Ebaugh HRF (1988) *Becoming an EX: The process of role exit*. University of Chicago Press, Chicago
- Ebbinghaus B (2006) *Reforming early retirement in Europe, Japan, and the USA*. Oxford University Press, New York
- Ekerdt DJ (2002) The fruits of retirement research [Millennium Paper]. *Contemp Gerontol* 9:35–39
- Ekerdt DJ (2004) Born to retire: The foreshortened life course. *Gerontologist* 44:3–9
- Ekerdt DJ, DeViney S (1990) On defining persons as retired. *J Aging Stud* 4:211–229
- Esping-Anderson G, Sonnberger H (1991) The demographics of age in labor market management. In: Myles J, Quadagno J (eds) *States, labor markets, and the future of old-age policy*, Temple University Press, Philadelphia, pp 227–249
- Ferrera M (2006) Pension reforms in Southern Europe: The Italian experience. In: Pemberton H, Thane P, Whiteside N (eds) *Britain's pension crisis: History and policy*, Oxford University Press, New York, pp 208–222
- Franco D (2002) Italy: A never-ending pension reform. In: Feldstein M, Siebert H (eds) *Social security pension reform in Europe*, National Bureau of Economic Research, Chicago, pp 211–261
- Gilleard C, Higgs P (2005) *Contexts of ageing: Class, cohort, and community*. Polity Press, Malden MA
- Golsch K, Haardt D, Jenkins SP (2006) Late careers and career exits in Britain. In: Blossfeld H-P, Buchholz S, Hofäker D (eds) *Globalization, uncertainty and late careers in society*, Routledge, New York, pp 183–209
- Gruber J, Wise DA (eds) (2004) *Social security programs and retirement around the world: Micro-estimation*. University of Chicago Press, Chicago
- Guillemard A-M, Rein M (1993) Comparative patterns of retirement: Recent trends in developed societies. *Annu Rev Sociol* 19:469–503
- Guillemard A-M, van Gunsteren H (1991) Pathways and their prospects: A comparative interpretation of the meaning of early exit. In: Kohli M, Rein M, Guillemard AM, Van Gunsteren H (eds) *Time for retirement: Comparative studies of early exit from the labor force*, Cambridge University Press, New York, pp 362–387
- Gullette MM (2007) Losing Lear, finding ageism. *J Aging Human Arts*, 1:61–69
- Haas WH, Bradley DE, Longino CF, Stoller EP, Serow WJ (2006) In retirement migration, who counts? A methodological question with economic policy implications. *Gerontologist* 46(6):815–820
- Haber C, Gratton B (1994) *Old age and the search for security: An American social history*. Indiana University Press, Bloomington, IN
- Hacker JS (2006) *The great risk shift: The assault on American jobs, families, health, and retirement – and how you can fight back*. Oxford University Press, New York

- Harrison B (1994) *Lean and mean: The changing landscape of corporate power in the age of flexibility*. Basic Books, New York
- Henkens K, Grift Y, Siegers J (2002) Changes in female labour supply in the Netherlands 1989–1998: The case of married and cohabiting women. *Eur J Popul* 18:39–57
- Henkens K, Kalmijn M (2006) Labor market exits of older men in the Netherlands: An analysis of survey data, 1979–99. In: Blossfeld H-P, Buchholz S, Hofäker D (eds) *Globalization, uncertainty and late careers in society*, Routledge, New York, pp 79–99
- Hofäker D, Pollnerová S (2006) Late careers and career exits: An international comparison of trends and institutional background patterns. In: Blossfeld H-P, Buchholz S, Hofäker D (eds) *Globalization, uncertainty and late careers in society*, Routledge, New York, pp 25–53
- Hudson RB (ed) (2005) *The new politics of age policy*. Johns Hopkins University Press, Baltimore
- Hutchens R (1994) The United States: Employer policies for discouraging work by older people. In: Naschold F, de Vroom B (eds) *Regulating employment and welfare*, de Gruyter, Berlin, pp 395–431
- Inkeles A, Usui C (1988) Retirement patterns cross-national perspective. In: Kertzer DI, Schaie KW (eds) *Age structuring in comparative perspective*, Lawrence Erlbaum, Hillsdale, NJ, pp 227–267
- International Labour Organization (2006) *Yearbook of labour statistics*. ILO, Geneva
- Jackson R, Howe N (2004) *The graying of the Middle Kingdom*. Center for Strategic & International Studies (CSIS) and Prudential Foundation, Washington, DC
- Jacobs K, Kohli M, Rein M (1991) *The evolution of early exit: A comparative analysis of labor force participation patterns. In: Time for retirement: Comparative studies of early exit from the labor force*, Cambridge University Press, New York, pp 36–66
- Johnson R (2001) Why the “average age of retirement” is a misleading measure of labor supply. *Mon Labor Rev* 124(12):38–40
- Katz S, Marshall B (2003) New sex for old: Lifestyle, consumerism, and the ethics of aging well. *J Aging Stud* 17:3–16
- Kimura T, Oka M (2001) Japan’s current policy focus on longer employment for older people. In: Marshall VW, Heinz WR, Krüger H, Verna A (eds) *Restructuring work and the life course* (pp 348–359). University of Toronto Press, Toronto
- Kinsella K, Phillips DR (2005) Global aging: The challenge of success. *Popul Bull* 60(1):3–40
- Kohli M (1986) The world we forgot: A historical review of the life course. In: Marshall VW (ed) *Later life: The social psychology of aging*, Sage, Beverly Hills, CA, pp 271–303
- Kohli M, Rein M, Guillemand A-M, Van Gunsteren H (eds) (1991) *Time for retirement: Comparative studies of early exit from the labor force*. Cambridge University Press, New York
- Laslett P (1989) *A fresh map of life: The emergence of the third age*. Weidenfeld and Nicolson, London
- Lindquist GS (2006) Late careers and career exits in Sweden. In: Blossfeld H-P, Buchholz S, Hofäker D (eds) *Globalization, uncertainty and late careers in society*, New York: Routledge, pp 211–234
- Macnicol J (2006) *Age discrimination: An historical and contemporary analysis*. Cambridge University Press, New York
- Martinson M, Minkler M (2006) Civic engagement and older adults: A critical perspective. *Gerontologist* 46:318–324
- Mesa-Lago C (2005) Assessing the World Bank report keeping the promise. *Int Soc Security Rev* 58:97–118
- Moschis GP, Mathur A (2007) *Baby boomers and their aging parents*. Paramount Market Publishing, Ithaca NY
- Munnell AH, Sunden A (2004) *Coming up short: The challenge of 401(k) plans*. Brookings Institution Press, Washington, DC
- Mutchler JE, Burr JA, Pienta AM, Massagli MP (1997) Pathways to labor force exit: Work transitions and work instability. *J Gerontol: Soc Sci* 52B:S4–S12
- Myles J (2002) A new social contract for the elderly? In: Esping-Andersen G, Gallie D, Hemerijck A, Myles J (eds) *Why we need a new welfare state*, Oxford University Press, New York, pp 130–172
- Myles J, Pierson P (2001) Comparative political economy of pension reform. In: Pierson P (ed), *The new politics of the welfare state*, New York: Oxford University Press, pp 305–333
- Orifowomo OA (2006) A critical appraisal of pension system reforms in Nigeria. *Gonzaga J Int Law* 10:164–201
- Organisation for Economic Co-operation and Development (1995) *The transition from work to retirement*. Social Policy Studies No. 16. Paris: OECD
- Organisation for Economic Co-operation and Development (2000) *Reforms for an aging society*. OECD, Paris
- Oshio T, Oishi AS (2004) Social security and retirement in Japan: An evaluation using micro-data. In: Gruber J, Wise DA (eds) *Social security programs and retirement around the world: Micro-estimation*, University of Chicago Press, Chicago, pp 399–460
- Palme M, Svensson I (2004) Income security programs and retirement in Sweden. In: Gruber J, Wise DA (eds) *Social security programs and retirement around the world: Micro-estimation*, University of Chicago Press, Chicago, pp 578–642
- Quinn JF (1999) Retirement patterns and bridge jobs in the 1990s. Employee Benefit Institute, Issue Brief No. 206. Employee Benefit Research Institute, Washington, DC
- Riley MW, Foner A, Waring J (1988) *Sociology of age*. In: Smelser NJ (ed), *Handbook of sociology*, Sage, Newbury Park, CA, pp 243–290
- Salditt F, Whiteford P, Adema W (2007) *Pension reform in China: Progress and prospects*. OECD Social, Employment and Migration Working Papers No. 53. <http://www.oecd.org/els>
- Savishinsky J (2004) The volunteer and the sannyasin: Archetypes of retirement in America and India. *Int J Aging Human Dev* 59:29–41
- Sennett R (1998) *The corrosion of character: The personal consequences of work in the new capitalism*. Norton, New York
- Serow W (2003) Economic consequences of retiree concentrations: A review of North American Studies. *Gerontologist* 43:897–903
- Shahar S (1997) *Growing old in the middle ages*. Routledge, New York
- Sørensen AB (1998) Career trajectories and the older worker. In: Schaie KW, Schooler C (eds) *Impact of work on older adults*, Springer, New York, pp 207–234

- Taylor P (2004) A “New Deal” for older workers in the United Kingdom? In: Maltby T, de Vroom B, Mirabile ML, Øverbye E (eds) *Ageing and the transition to retirement: A comparative analysis of European welfare states*, Ashgate, Burlington, VT, pp 186–204
- Teipen C, Kohli M (2004) Early retirement in Germany. In: Maltby T, de Vroom B, Mirabile ML, Øverbye E (eds) *Ageing and the transition to retirement: A comparative analysis of European welfare states*, Ashgate, Burlington, VT, pp 93–119
- Toossi M (2005) Labor force projections to 2014: Retiring boomers. *Mon Labor Rev* 128(11):25–44
- United Nations (2007) *World population ageing 2007*. Department of Economic and Social Affairs, Population Division. United Nations Publications, New York
- United Nations Development Programme (2006). *Human Development Report 2006*. Palgrave Macmillan, New York
- Wadensjö E (2002) Active strategies for older workers in Sweden. In: Jepson M, Foden D, Hutsebau M (eds) *Active strategies for older workers in the European Union*, European Trade Union Institute, Brussels, pp 381–402
- Williamson JB, Higo M (2006) Why do Japanese workers remain the labor force so long? Center for Retirement at Boston College, Chestnut Hill, MA
- World Bank (2000) Nigeria: Financial sector review. Vol. 3, Non-bank financial institutions and markets. Report No. 29941. www.worldbank.org

Chapter 22

Income Inequality in Later Life

Melissa Hardy

Introduction

Inequality is one aspect of diversity. Differences among individuals, groups, organizations, or nations can be constitutive of a rich variety in talents, interests, expertise, or culture. But, when people face differences in opportunities, resources, rights, political access, life expectancy, or standard of living, for example, we speak in terms of inequality rather than diversity. This distinction in terminology signals the special meaning we assign to the distribution of hierarchically valued goods. However, this sorting process – the distinctions made between what we value and what we respond to with indifference – depends on context. Being able to read sets one apart from those who cannot read and being able to read well – better than many of those who can read – can be an asset when one lives in a world where the skill of reading provides access to people, positions and opportunities favorably located relative to the processes of production and distribution. Similarly, countries with high literacy rates are often viewed as more “developed” than countries with low literacy rates. But these rankings correspond to a global environment that values reading as an essential skill, one which commands higher levels of compensation and rewards a highly literate population with a relatively high standard-of-living made possible by a highly productive national economy. Whereas, the term diversity suggests a non-uniform distribution of something, inequality suggests a non-uniform distribu-

tion of something that matters either in a positive way, where access to or amount of that something provides advantage, or in a negative way, where exposure to or accumulation provides a disadvantage.

Because inequalities imply fundamental differences in life experiences, the quality of life or well-being enjoyed by an individual, group, or population, the concept of inequality is at the center of moral theories (Hausman and McPherson 2006). Are the social, economic and political processes that generate these unequal distributions legitimate? Are their outcomes justified? By what authority can persons, groups, or nations make demands on one another that interfere with these processes? When we think about inequality in the context of “aging,” our tendency is to think about the distribution of valued resources either across age groups or across the life span. Implied in those comparisons is an underlying theory of how the process of aging intersects with the processes of production, distribution and consumption as well as how we may accumulate resources or claims to future resources as we age. Also implied is how the experience of aging for individuals (birth cohorts, or generations) intersects with changes in population age structures. For example, if we assume that the adult life course is divided into a period of employment followed by a period of retirement and that years of employment are characterized by accumulating resources and establishing claims to future resources whereas years in retirement are dominated by consumption of those resources, we might expect that the level of inequality that characterizes cohorts as they enter retirement will certainly not be diminished in retirement, since retirement marks the end of the period of employment-based accumulations. Instead, we might surmise that levels of inequality would increase, since those who have accumulated the most resources can afford to hold some portion of

M. Hardy
Gerontology Center
The Pennsylvania State University
University Park, PA 16802, USA
E-mail: mah38@psu.edu

those resources in reserve, allowing them to continue to accumulate. In consequence, those who have the most resources will be in a position to generate even greater wealth while those who have the least will be struggling to cover expenses.

Measures of Inequality

In contrast to measures of central tendency or dispersion, inequality measures provide information about the relative economic positions of persons and households (Coulter 1989). Two common measures of inequality rely on shares of aggregate resource. If the proportionate sizes of the shares of aggregate resource match the proportions of aggregate units receiving (or holding) the resource, then we judge the distribution of that resource to be equal across units, whether those units are persons, households, or population percentiles. The second measure we will use is the Gini coefficient, a summary statistic based on the Lorenz curve. Higher values of the Gini coefficient, which ranges between zero (in which the resource is equally distributed across all units) and 1 (in which all resource is attached to a single unit, with remaining units having none), indicate greater inequality. Whether these distributions are fair or just are questions for a different chapter.

When addressing questions of economic inequality, earnings, income and wealth are the most frequently studied indicators, even though earnings (wages and salaries) have been less important for the household incomes of those aged 65 and older. Even so, as age for pension entitlement increases and labor force participation rates at older ages increase, earnings are likely to become a more important income source for older households. Earnings are the central component of income for most households headed by young and middle-aged persons. Household income, however, also includes government transfers (e.g., Social Security benefits, monetary social welfare benefits), private transfers (e.g., child support and alimony), capital income (e.g., interest and dividends) and various other sources of revenue.¹

In contrast to income flows, wealth refers to a household's stock of assets, generally measured as net worth. For older households in particular, wealth can be an important source of income, an economic reserve to pay for catastrophic health shocks and a factor in deciding when to retire. Therefore, wealth accumulation should be an important goal for households at younger ages and in midlife but achieving that goal requires discretionary income that can be used to acquire assets (Juster et al. 1999).

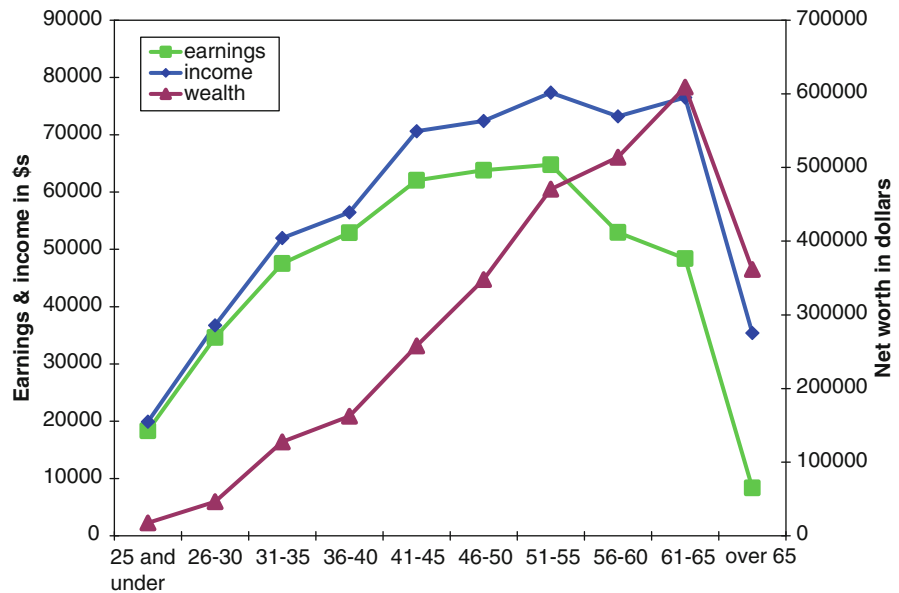
These three measures are positively correlated across the population, although the strength of correlation may be lower than one imagines. Earnings and income have the strongest correlation (0.715), followed by income and wealth (0.60) and earnings and wealth (0.463; 0.51 when retired households are excluded) (Rodriguez et al. 2002). Age-earnings profiles generally rise from young adulthood to midlife, peaking at about age 55 and then declining. Age-income profiles are similar, although income levels decline less quickly than earnings. Age-wealth profiles peak about 10 years later in the early 60s and exhibit a shallower decline than either earnings or income. These patterns for 1998 are illustrated in Fig. 22.1. As averages across age groups, these profiles present a useful heuristic that describes the earnings, income or wealth trajectories. The extent to which the experiences of persons or households mirror this pattern depends on many factors, including education, health and occupation.

In the U.S., income inequality in old age is largely an extrapolation of inequalities in both process and outcome that are rooted in earlier stages of the life course. Because of the association among earnings, income and wealth, demographic characteristics that are predictive of favorable labor market outcomes, such as relatively high and sustained earnings, as well as factors linked to relative economic advantage can have important implications for economic security at older ages. For example, because education is a significant factor in determining occupation as well as wages and salaries within broad occupational categories, it is also related to differences in income and wealth. College-educated

or real estate; rent, trust income and royalties from any other investments or business; unemployment and worker compensation; family support payments, food stamps and other forms of welfare and assistance; income from pensions, annuities, compensation for disabilities and retirement programs; other income including settlements, prizes, scholarships and grants, inheritances and gifts (see e.g., Slesnick 1992).

¹ In this chapter as in much of the relevant research, income is defined as all kinds of revenue before taxes. In addition to the components mentioned in the text, income includes positive and negative income from professional practices, businesses and farm operations; gains or losses from the sale of stocks, bonds,

Fig. 22.1 Average level of earnings, income and wealth by age cohort
 Source: Rodriguez et al. (2002). Updated facts on the U.S. Distributions of Earnings, Income and Wealth. Federal Reserve Bank of Minneapolis Quarterly Review, 26(3):2–35.



Source: Figures from Table 8, Rodriguez et al. 2002, based on the 1998 Survey of Consumer Finances.

households are the most advantaged with above average earnings, income and wealth. Households headed by someone without a diploma are in the worst financial situation. Rodriguez and colleagues (2002) estimated that average earnings of households headed by someone with a college education (high school diploma) are 4.7 (2.3) times the earnings of those with less than a high school education. Differences in wealth are even larger, estimated at 6.9 (2.4) for college educated (high school graduate) household heads.²

Marital status is a second characteristic that distinguishes those in stronger versus weaker financial circumstances. Married couples are in a stronger position than singles, with substantially higher earnings, income and wealth than their unmarried counterparts. Single women with dependents are in the weakest positions. Average earnings and income of couple households are almost three times the earnings of singles; their wealth holdings are 2.3 times the wealth of singles without dependents and 3.7 times as large as the holdings of singles with dependents (Rodriguez et al. 2002).

In market economies, money income plays a central role in that it provides the metric of common valua-

tion and the means of primary distribution, connecting labor to compensation to consumption. Each transaction can be completed immediately, or a promise of all or part of the exchange can be deferred to the future – either a particular date in the future or in accordance with an agreed upon schedule. We associate old age with a reduction, if not a cessation of work-for-pay. If we reject the notion that those no longer working must become dependent on someone else's earnings (e.g., a family member), the state (e.g., social welfare), or charity, then income inequality in old age must reflect streams of income (other than earnings) that are established at earlier ages – reservoirs of resource that can be released gradually to cover expenses. These reservoirs can be collective or personal caches, although even individual caches are valued relative to a complex web of interdependent activities.³ As our population ages and the societal costs and benefits associated with an age structure that reflects a growing number (and proportion) of older people relative to children, adolescents and young adults are reconfigured, the extent to which construction of such reservoirs is the responsibility of governments, employers, families and persons continues as a point of debate.

² Differences in income are smallest, primarily because income includes the transfer payments from social welfare programs, which are received by a relatively large proportion of households headed by someone without a high school diploma (Rodriguez et al. 2002).

³ That is, monetary value is a market-based process that can vary with inflation, interest rates, demand and supply as various commodity markets fluctuate.

Historical Context

The nexus of income inequality and old age is historically contingent, depending on macro-economic events; personal behaviors; cultural values; and how all of these are jointly translated into both institutional patterns of allocation and the financial choices made by persons, families and households. As populations age, fundamental decisions regarding the allocation of economic resources are being reexamined. Although population aging may not always coincide with fundamental changes in the industrial structure, for the U.S. and other high income countries, the effects of population aging, globalization, the restructuring of financial markets and the growth of the service economy are juxtaposed with environmental concerns, the depletion of key natural resources and international pressures to address profound economic inequalities across nations. That the median age of our population is rising as our trade deficit climbs, our national debt mounts and income, earnings and wealth become ever more concentrated requires that we address these challenges with policies that are mindful of current conditions and likely futures. Although population aging did not cause any of these contemporaneous trends, how we deal with population aging must take into account this particular and, in some ways, unfortunate historical context.

Resources in general and income in particular can be distributed through various institutions and relative to an assortment of principles. In contemporary high income countries, market processes dominate resource distribution but they do so within a political environment that allows the development or amendment of government policies of taxation, social insurance, social welfare and business regulation. These policies can reinforce prevailing market processes, attenuate them, or interfere with them. Nations differ in the roles they define for federal, state and local governments and any specific nation's history can reveal a shifting balance between increasingly concentrated versus more broadly dispersed income and wealth.

Recent Trends in Inequality

The period that began with the end of World War II can be divided into two economic periods (Levy 1998; O'Rand and Henretta 1999). From the mid-1940s to

1973 real wages for male workers grew at a healthy rate and society-wide inequality in family income remained relatively stable. As the Viet Nam War was ending, the U.S. was beginning an extended period of slowly rising economic inequality. From 1973 forward, wage disparities increased as did inequality in the distribution of family income. Although inequality in both earnings and income also increased in other high income countries during this period, the U.S. was unusual in displaying both high levels of earnings and income concentration exacerbated by relatively large increases in inequality during the 1980s (Gottschalk et al. 1997; Slesnick 1993; Weinberg 1996). Not only does the U.S. have comparatively high rates of overall income inequality but among those aged 65 and older, the distributions of income and wealth are also among the most unequal.⁴

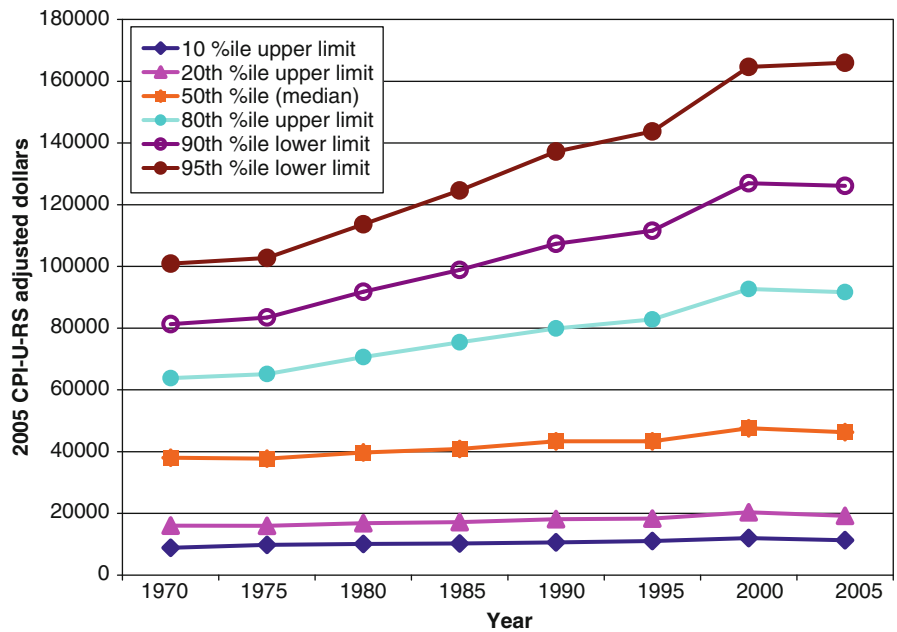
Today we find that income is more heavily concentrated among the top five per cent as well as the top 20 per cent of U.S. households than at any time in recent history and, according to some scholars, any time since the depression (Piketty and Saez 2003). Since 1970, the share of aggregate income flowing into poor, working and middle class households has declined as a larger share has shifted into the top 20 per cent of U.S. households (an increase of 17 per cent) and especially into the top five per cent of households, whose share of aggregate income increased by 34 per cent.

Figure 22.2 illustrates how growth in household income has been disproportionately allocated to wealthier households. Reported in 2005 dollars, the upper limits of household income demarcating the two poorest deciles (10th and 20th percentiles) barely change during the 35 year period. Median household income grew slowly, at an annualized rate of less than 3 per cent. In contrast, income boundaries for the top 20 per cent (80th percentile), the top 10 per cent (90th percentile) and the top 5 per cent (95 percentile) increase at a much faster rate, a reflection of the growing concentration.

Since household income is largely a function of earnings, the increasing inequality in individual earn-

⁴ Researchers from the Luxembourg Income Studies (LIS) report that the distributions in the U.S. contrast with those in most other countries in which the levels of inequality among the aged are lower than among the nonaged. The country comparisons on which these conclusions are based include Australia, Canada, France, Germany, Netherlands, Sweden, the United Kingdom and the U.S.

Fig. 22.2 Household income at selected percentiles, 1970–2005
 Source: U.S. Census Bureau, Current Population Survey, Annual Social and Economic Supplements. Table H-1. Income Limits for Each Fifth and Top 5 Per cent of Households All Races: 1967 to 2006 (households as of march of the following year. Income in current and 2006 CPI-U-RS adjusted dollars).
<http://www.census.gov/hhes/www/income/histinc/h01ar.html>



ings is part of the same trend. As shown in Fig. 22.3, earnings inequality fluctuated around .33 during the 1970s but climbed steadily through the first half of the 1980s, jumping higher in the early 1990s and then

continuing the climb. The increased earnings inequality characterizing the 1980–2005 period (which reflected only a 14 per cent increase in real median weekly earnings for full time workers and an increase

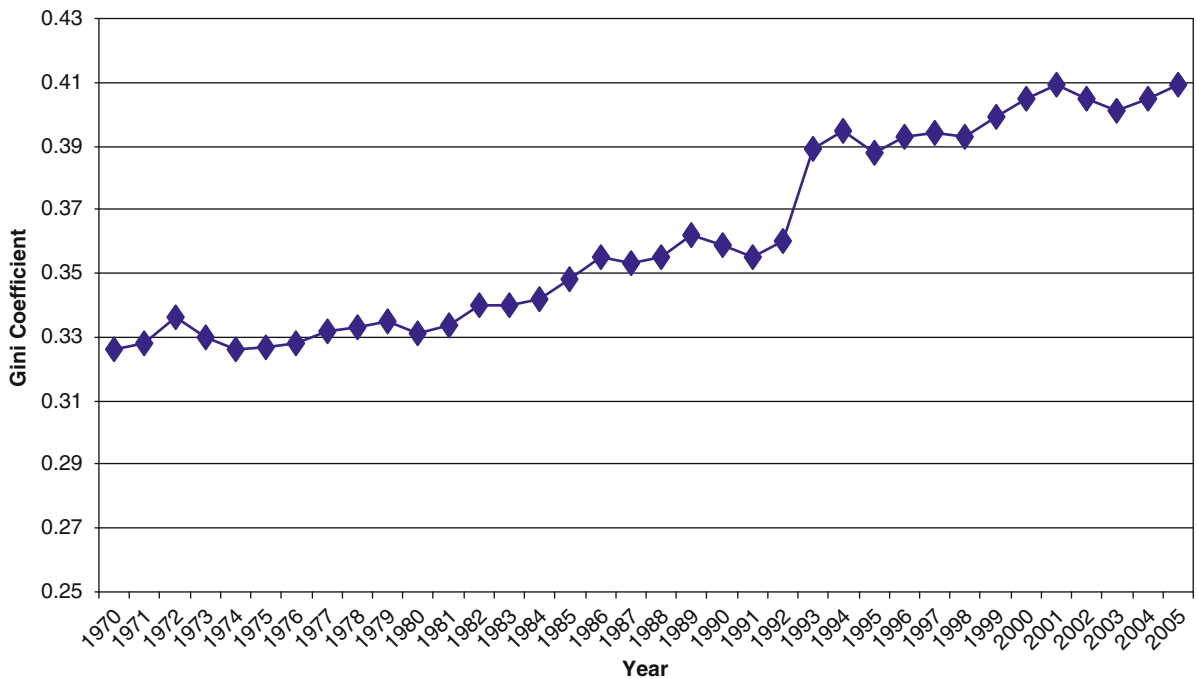


Fig. 22.3 Gini coefficient of individual earnings inequality for full-time year-round workers, 1970 to 2005
 Source: U.S. Census Bureau, current population survey, annual social and economic supplements. Table IE-2, measures of individual earnings inequality for full-time, year-round workers by sex: 1967 to 2005.
<http://www.census.gov/hhes/www/income/histinc/ie2.html>

in real median weekly compensation of 19 per cent) coincided with a 67.4 per cent increase in non-farm business productivity. In contrast to the experience of average workers, the very top earners fared much better (Levy and Temin 2007). If we focus on the top 1 per cent of tax filing units, we see that their share of gross personal income more than doubled during this 25-year span, rising from 8.2 to 17.4 per cent by 2005, an increase of 112 per cent. Further, the share of wages and salaries allocated to the top 1 per cent expanded from 6.4 to 11.6 per cent, an increase in excess of 81 per cent.⁵

Theoretical Perspectives

Questions about the levels of income inequality and the factors producing inequality can be raised in cross-sectional or longitudinal contexts. We can focus on a population at a given point in time and ask how income inequality among older households differs from that of younger households and whether the determinants of inequality are shared across age groups and/or distinct to a particular group. We can assess inequality in the distribution of earnings, income or wealth with various measures and then enumerate the personal and household characteristics that predict where a person or household is located in the overall density distribution. Often, our views of fairness and social justice are linked not only to how unequal a distribution might be but to how well the relative positions occupied in this distribution are assigned relative to factors we believe should predict who has more versus less or how well the overall picture of winners and losers conforms to our personal theories of merit, skill, significance and responsibility. Although this approach provides descriptive information about who is faring better or worse, it leaves unaddressed the more fundamental question: Why?

Theories about economic rewards – whether academic theories or everyday theories of relative worth – can incorporate a variety of allocation processes and their comparative influence on outcome distributions. We routinely make these types of judgments when we

meet people similar to ourselves – same age, gender, race-ethnicity, marital status, education, job. We can reasonably predict that their financial situations will be roughly similar to our own. Small deviations from this prediction can be due to the normal variation that we expect to encounter – variation that should “cancel out” when we consider those doing better and those doing worse. Large deviations we tend to attribute to luck, unpredictable auspicious or undesirable perturbations to the distribution. Alternatively, they could be due to different endowment positions that lead to either healthy inheritances or sizeable liabilities that flow from our connections to other family members and their various needs and resources. Or they could result from different levels of skill, or ambition, or ability. We expect disparities but as individuals and occasionally as a society, we question whether the magnitude or the pattern of those disparities is legitimate. Such concerns lead us to examine the sources of economic inequality and whether some factors seem to matter more than they “should” and whether we can conclude that the overall distribution of economic resources is legitimate.

Longitudinal Approaches

If we adopt a longitudinal perspective, we can examine an array of successive states across time, noting whether the differences in annual earnings (or income, or wealth) between or within groups stays about the same, shrinks or expands as time passes. We can also determine whether relative positions in these distributions are stable across lifetimes, perhaps across generations, or whether we find considerable mobility – both within lifetimes and across generations. Finally, if mobility is typical, we can determine whether the shifts are primarily upward, primarily downward, or offsetting. Some writers have argued that the U.S. tolerates high levels of inequality because of the underlying belief that the boundary of the upper class is highly permeable. Ironically, this belief persists in the face of recent studies comparing incomes of fathers and sons at equivalent stages of career and demonstrating that sons born to low-income fathers are *less* likely to move up in the USA than in other countries such as Denmark, Norway and the United Kingdom (see, e.g., Solon 2002; Corak 2004; Jäntti et al. 2006).

⁵ See Piketty and Saez, 2003, and <http://elsa.berkeley.edu/~saez> for 2005 figures and details of calculation and percentile definition.

If passing time is marked as historical time, then we look to macro influences such as economic recession, industrial reorganization, shifts in the terms of compensation, or changing population structure to explain the trend. If time is measured as personal biography, then we ask whether the income profile indicates stagnation, growth or decline, whether this particular trace is reproduced by profiles for “similar” sorts of people or whether this same pattern provides a description of a uniform prototype that has occurred regardless of cohort, regardless of gender, regardless of any number of other potential sources of variability.

In judging income inequality relative to the aging process, aging generally serves as a proxy for economic transitions that can be linked to personal biographies or to stages of the life course and many transitions reflect both personal and institutional features. For example, a transition into widowhood has implications for an analysis of income inequality because married couples tend to be in stronger financial positions than singles but also because widowhood is a transition that occurs more frequently at older ages, which implies certain limitations on how someone newly widowed can respond to her new financial situation. That poverty rates are higher for widows than for wives in old age is a reflection of how various societal institutions – marriage, employment, government, family – are insufficiently articulated relative to this late life transition (Burkhauser 1990; Burkhauser et al. 2005; Hardy and Hazelrigg 1993; Willson and Hardy 2002). Rather than providing complementary coverage and support, widowhood remains an under-protected status for which institutional supports are deficient.

Status Maintenance, Cumulative Advantage and Status Leveling

Three perspectives are conventionally invoked in explanations of old age inequality: status maintenance, cumulative advantage and status leveling. Each perspective implicitly or explicitly invokes a particular balance of redistributive regimes. Market-based mechanisms emphasize exchange-based systems of value framed in the contemporary language of marginal utility theory, which focuses on the value of increments – the price paid for the last increment and the price we expect to pay (or be paid) for the next.

Market behavior, therefore, invokes expectations of future conditions. Redistribution occurs as a consequence of buying and selling but whether the buyer or the seller is favored in that exchange depends on any number of factors, including the future transactions of other often anonymous actors. The transactions of these actors have a moral dimension. We often pretend that certain decisions can be justified with the phrase “it’s just business,” invoking an attitude which allows us to distance ourselves from any negative consequences – intended or unintended – that flow from our actions. The bureaucratic form of organization has been a primary means of distancing “business” decisions from their consequences. Both markets and bureaucracies as organizational forms subjugate ascribed characteristics – who one is – to traits that are highly individualized – skill, judgment, ability – and presumably malleable. That markets operate in this individualized way invites the conclusion that the outcomes of market processes – the composition of winners and losers – are deserved (see, e.g., Hardy and Hazelrigg 2007).

An important extension of this acceptance of outcome distributions is the resistance to government regulation or any legislation that “interferes” with markets. All such interventions that mandate redistribution are viewed as less “efficient” than the outcome produced by “unfettered” market transactions. Efficiency – in its narrow, technical sense – rests on the potential negative consequence of any redistribution: an allocation is efficient if no possible reallocation would improve the situation of any person or persons without worsening the situation of at least one other person (the notion of Pareto efficiency). Since redistributive policies – those that collect revenues from one group and then allocate proceeds to a different group – are, in the narrow sense, benefiting the recipients while making the contributors worse off, by definition they lead to inefficient outcomes. Whether this reconfigured distribution is equitable or fair (or at least more equitable or more fair) in the conventional sense of the words is not considered within this framework.

The alternative form to markets is hierarchical organization, which allows allocation processes to be developed relative to explicit principles of economic justice. If we view collective programs, such as social insurance, as an example of this organizational form, we can see the redistributive consequences are deliberate and predictable, occurring through tax policy, terms of entitlement and explicit formulas for

determining how funds are allocated. Progressive tax approaches take more – in absolute and/or in marginal proportional terms – from those who have more. Progressive social insurance benefits give more proportionately to those who have contributed less and they allocate less in proportional terms but more in absolute dollars to those with high income. Social welfare targets the poor either by exempting them from taxation (as in the earned income tax credit) or by making them eligible for dollar or in-kind benefits.

That income is allocated primarily through the market as wages and salary income (earned income) to those in young adulthood and midlife is well established. But the transition to a wage economy left unsettled the question of how people who were not part of the labor market could provide for their basic needs. Where would their money come from? The U.S. addressed this problem by defining different sub-groups of people from among all those who were not working for pay. The independently wealthy could take care of themselves. Spouses and/or children living with a wage earner would depend on household earnings and could engage in some amount of “home production” (e.g., through cooking, gardening, carpentry, sewing). Those able and willing to work but unable to secure a job represented a short term problem; they needed some support while they searched for the right job. Ultimately, those with disabilities were covered by social welfare and those with work-related disabilities were addressed by social insurance programs and grouped with people who were considered too old to work. Being “too old” could mean that one was not physically or mentally able to do the work but it could also mean that workers still capable of job performance were regarded as less desirable than younger workers ready to take their places. European countries referred to this as a “redundancy” problem.

The U.S. opted for a patch quilt of options, including employer sponsored pensions and individual savings and investments but early experience demonstrated that these two sources were insufficient and too often unreliable. A social insurance program that provided basic benefits to retirees, disabled workers and their dependents gradually became a mainstay of wage replacement programs. More recently, earnings income has emerged as a favored fourth source for retirement income. Although relying on earnings for retirement income seems oxymoronic, it highlights the

transformation in the nature and meaning of “retirement” in U.S. society. Whereas retirement had been regarded as a labor force exit, almost always an irreversible one, recent volatility in late-stage careers has expanded the status of retiree to include people who are working full-time (after leaving a career job), part-time, part-year, or not at all. In fact, some researchers argue that the definition of retirement should rely more on sources of income (e.g., pensions) than on work activity.

Status maintenance. Theoretical perspectives differ in the emphasis they place on market versus social insurance wage replacement programs as well as the impact of societal institutions. Status maintenance perspectives argue that inequalities in endowment positions, such as different circumstances of birth, childhood and adolescence – are preserved as we age. Early educational advantages are parlayed into career advantages that then translate into experiencing retirement under relatively favorable circumstances. Although cohorts may display different levels of inequality, which may be linked to different historical circumstances that intersect the life course at difference stages, within-cohort inequality remains fairly stable as any given cohort ages. The status maintenance argument therefore views political forces and social institutions as ineffective in accomplishing any significant redistribution, although social policies may be containing inequality by not allowing it to increase as cohorts age. Therefore, rather than reducing levels of inequality, status maintenance suggests that social institutions may constrain or offset the growth of inequality. Even so, since the state is viewed as a reflection of economic interest groups, interfering with market dynamics is assumed to be a low priority. Also consistent with status attainment literatures, which emphasize the importance of individual traits and effective socialization in launching young adults on promising career tracks, status maintenance suggests that inequality and the factors that predict differential success (e.g., parental status, education, early employment) change little during old age. Even though retirement income depends on social insurance benefits, the reliance of social insurance payments on earnings histories links these benefits to market criteria. Studies finding empirical support for this perspective tend to be based on cohorts of retirees who were born in the early part of the 20th century and retired in the 1970s and early 1980s (e.g., Henretta and Campbell 1976).

Status Leveling. In contrast, status leveling approaches hold that federal policies that provide wage-replacement income through social insurance programs significantly reduce variability in retirement income. Using variance as one estimator of inequality, the more compact distribution of social insurance benefits is characterized by a lower level of income inequality than more widely dispersed and positively skewed earnings distribution. To the extent that such benefits are the dominant component of retirement income, redistributive state programs can reduce (at least to some extent) the status differences that so sharply separated people during their working lives. For this to occur, however, we must assume that the impact of market forces occurs primarily through the labor market and is co-temporal with actual work behavior.

In recent decades, compensation packages for at least half the labor force have provided a mixture of contemporaneous payment (wages and salary), deferred compensation (pension benefits), insurance coverage (health, life, disability), subsidized services (health club memberships, travel planning, transportation, child care) and job perquisites that support a standard of living in excess of what “take-home pay” would allow. This explosion in earning based forms of compensation, made available to those already in the upper portion of the earnings distribution, allows market based inequities accessed through employment to cast long shadows into the retirement years. Claims to deferred compensation accumulate as do savings and investments. In this way, the market forces that sort people into high earners and low earners also sort workers into good jobs and bad jobs. Good jobs imply more than high earnings in the present; they also provide workers with opportunities, networks and information that allow them to build wealth.

Status Divergence. The status divergence perspective predicts increased inequality in old age as those with status advantages in early life, during young adulthood and midlife are best able to accumulate resources to support them in retirement (O’Rand 2003). Those persons disadvantaged in midlife face additional hardship in old age, as they experience more difficulty finding employment but have no resources to replace their earnings. Often referred to as cumulative advantage theory, researchers have demonstrated increased inequality in old age. Unequal access to retirement income sources as well as unequal distributions of source-specific income fuels increases in inequality as

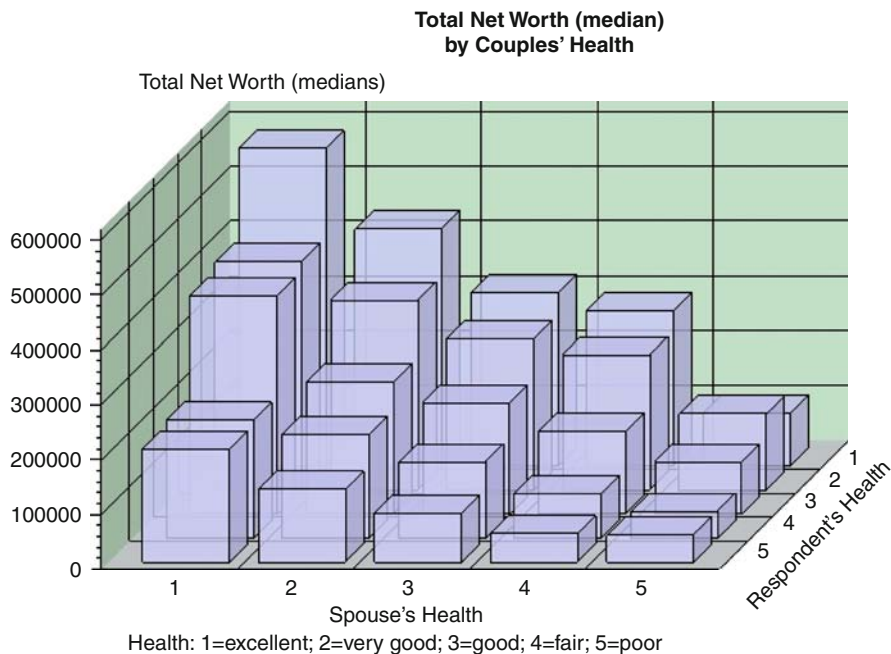
cohort members age (Crystal and Shea 1990a, 1990b; Pampel and Hardy 1993, 1994; Wolff 1995).

That people tend to accumulate advantages or disadvantages as they age also provides a framework for interpreting the relationship between economic resources and health. The relationship between health and income has been well established in the literature (e.g., Feinstein 1993; Smith 1998; Williams and Collins 1995). Although determining whether income reflects or is implicated in the development of health problems has presented a challenge to researchers. Within the health literature, income is often used as a proxy for access to health care, the quality of health care and the likelihood that preventive care is routinely available. Because income is correlated with other indicators of socio-economic status (SES), it can also reflect educational and occupational disparities. While education can predict career trajectories, information gathering and comprehension skills, as well as social and professional networks, occupational locations imply different sorts of work demands and work environments, which can be reflected in differential health risks. SES is also correlated with health behaviors, nutrition and other aspects of lifestyle that can influence health risks.

Less attention has been paid to the connection between health and wealth, although for older persons, wealth is an important source of income and economic resiliency (Lum 2004). A strong positive relationship between SES and health should be reflected in all four measures of SES – income, education, occupation and wealth – although each measure arguably captures somewhat different dimensions of the health-SES connection. Although correlational evidence leaves open the question of how the association unfolds across time, the relationship between couples’ health status and net worth is striking. Based on 2004 HRS data, Fig. 22.4 illustrates how the health status of spouses corresponds to different median levels of total (including home equity) net worth. Accumulations drop quickly along the diagonal, as spousal health status shifts from excellent (in the upper left corner) to good (in the center of the grid) to poor (in the lower right corner).

As a measure of accumulated resource, wealth among older households can reveal the consequences of persistent financial insecurity as well as income volatility, since both situations would interfere with the process of accumulation. Not only is wealth distinct from income (and other measures of SES) but at different ages wealth tends to be held in different forms.

Fig. 22.4 Total net worth (median) by couples' health 2004
Source: author's calculations from HRS.



While the wealth of young families may be primarily held in cars, homes and other capital goods, in older households a significant component of wealth is home equity. The relationship between health and wealth demonstrated in various studies (e.g., Robert and House 1996; Wenzlow et al. 2004), has also included the demonstrated connection of income and wealth to mortality, even when other measures of SES are controlled. Household income is more strongly associated with mortality for women than men and for the nonelderly than the elderly, although economic status before and during retirement appears to be an important predictor of post-retirement health. Arguably, some of the health effects of SES may be reflected in sorting those who survive to age 65 from those who do not; nevertheless, among those older than 65, wealth and family income continue to predict mortality risks (Duncan et al. 2002).

When we compare Gini coefficients for household wealth by age group for the 1967 to 1997 period (Fig. 22.5), we see that with the exception of the years 1967–1977: Gini coefficients for both sets of households have been gradually rising; inequality among the households of those 65 and older are consistently higher than for those younger than 65; and the gap in inequality between younger and older households has been narrowing. During the 1967–77 period, inequality declined slightly for those younger than age 65

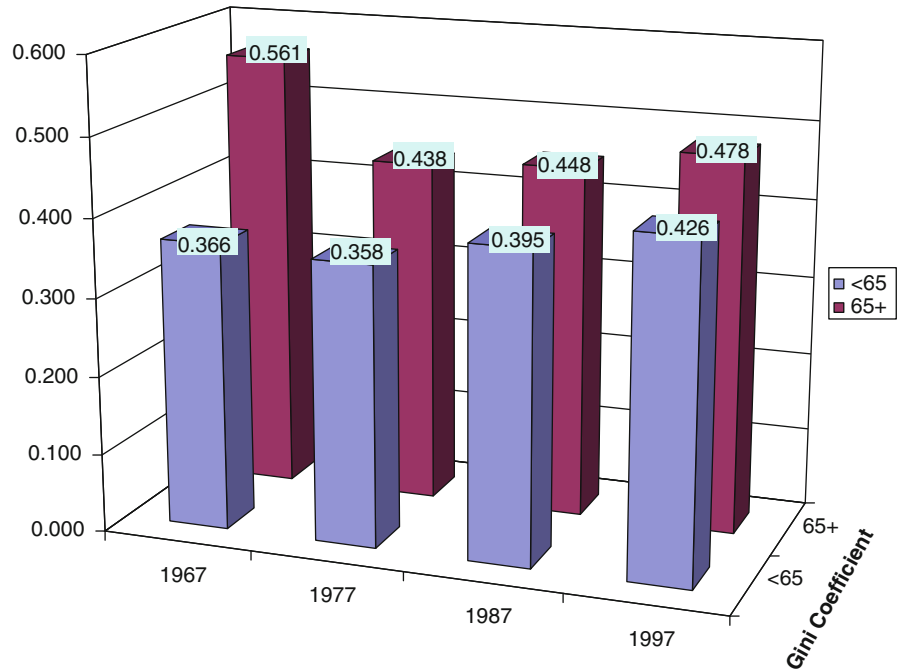
and markedly for those aged 65 and older. Recall that Lyndon Johnson's "War on Poverty" was legislatively launched in 1965 and that the Social Security program was amended to increase the real value of benefits (on several occasions), index benefits to a cost-of-living escalator and index earnings histories to changes in real wage rates (see Hardy and Hazelrigg 2007).

Sources of Income

As we age, our reliance on the numerous sources of income changes. Whereas children-as-dependents rely on family income for their support, young adults and those in mid-life rely primarily on earned income for financial support; as they may spend, save and invest, the general orientation through midlife has been one of consumption and accumulation.⁶ This accumulation can take place in various ways. For most people, home equity is their largest investment and represents a significant proportion of their net worth but people also build their financial situation through other sorts of saving vehicles. Essentially, people save (or defer)

⁶ Those unable to work must rely on support from family and social insurance programs, as must those who are able to work but without a job. A small minority of people control sufficient wealth to support their expenditures but they are the exception.

Fig. 22.5 Gini coefficients for households 65+ and <65 for 1967, 1977, 1987, 1997
 Source: Income distribution of Older Americans, Table 1, Rose M. Rubin, Shelley I. White-Means, Luoqia Mao Daniel. Monthly Labor Review, November 2000.



some of their compensation from work in the expectation that they will convert what they have saved into a steady and reliable flow of income in old age. Some of these mechanisms are specifically designed as earnings replacement programs. Given the expectation that at some point, people are unwilling or unable to work for pay, their subsequent income security depends on how successfully they can substitute other flows of income for earnings. One way workers can provide income in retirement is through pensions. Workers can also accumulate “pension wealth,” which is a claim to future pension income based on a labor contract (as in defined benefit pensions), the value of an account when it is annuitized (as in defined contribution plans or IRAs), or on a social contract (as in the benefits workers expect to receive from Social Security). To the extent that such claims can transfer to surviving spouses, pensions provide a potential source of retirement income for both workers and their spouses.

Second, people can contribute to savings and investment accounts to build their financial resources. Through this type of saving behavior, people plan for their future needs and attempt to balance how much of their resources they use to satisfy current consumption needs and how much they allocate to their future consumption needs. In addition to putting money aside for the future, people must decide what sorts of savings and investment vehicles they will use. The alternatives

vary according to risk and reward, a common trade-off that forces one to weigh the relative importance of two competing emotions – greed and fear. The same history of contributions to such accounts can therefore yield very different sorts of balances, depending on the amount of risk investors were willing to assume and their ability (or good fortune) to choose investments that increased rather than depleted their resources.

Finally, people can choose to continue employment into old age, delaying or even foregoing retirement. This pattern has not been a common one but some people in their 60s, 70s and beyond continue to rely on earned income as a significant if not dominant form of income. Income sources in old age therefore include Social Security (social insurance, with a small component of social welfare through SSI), employer sponsored pensions (DB, DC or hybrid plans), investment and savings (income from interest or dividends; the principle; or sales of stocks, bonds, real estate, or other property) and earnings. Given this variety of sources, annual income in old age depends on how many different sources of income one has access to, how much income each source yields and whether the amount of income is fixed or whether it is routinely adjusted for inflation. Of course, all depend on a stable and healthy national economy. For example, investments and savings accounts have value exchange only insofar as the institutions promising to make funds available on

demand are able to do so. Employer-sponsored DB pensions provide benefits only insofar as their pension funds have been effectively managed so that benefit claims can be translated into benefit payments at full cash value.

Income inequality is generated by differential access to income sources and by the differential amounts to which people are entitled.

The Balance between Social Insurance and Market Income

Social Security

How important is Social Security as a tool of wage replacement for today's retirees? Nearly universal in coverage, more than 90 per cent of all Americans over age 65 rely on Social Security for retirement income; of these beneficiaries, 82 per cent are retirees, 6.5 per cent are spouses and 11.5 per cent are survivors. Although the proportion of total income provided by Social Security varies, Social Security benefits supply about 40 per cent of all income received by current retirees. Of course, 40 per cent is an average value. Roughly one-third of beneficiaries age 65 and older, who became entitled in 2006, rely on Social Security for 90–100 per cent of their total income; one-third rely on Social Security for 50–89 per cent of total income; and the remaining one-third rely on Social Security for less than half their total income (Social Security Administration 2006).

Initially designed to pay benefits relative to total covered earnings, the basis for calculating benefits was quickly shifted to average monthly earnings in 1939, to address the immediate problem of old age poverty and shifted again to average indexed monthly earnings in the mid-1970s to allow retirees to benefit from the growth in real wages experienced during their working lives. The calculation of benefits is currently based on a progressive formula that replaces a larger share of covered earnings for low-wage versus high-wage workers. These replacement rates – the ratio of retirement benefits to pre-retirement earnings – reflect the income maintenance aspect of the program designed to redistribute aggregate contributions to low-wage earners and thereby keep their incomes

above the poverty line during old age. Comparisons of replacement rates for workers age 65, who were entitled in 2006, depend both on the worker's earnings history and whether spousal benefits are included in the calculation. Adding spousal benefits increases the replacement rate at all earnings levels. At maximum covered earnings, about 30 per cent of workers' pre-retirement earnings were replaced, compared to about 41 per cent for medium earnings and almost 56 per cent for low earners. When spousal benefits are included in the calculations, replacement rates increase to 43.3 per cent, 61.9 per cent, and 83.4 per cent for maximum, medium and low wage earners (Social Security Administration 2006).

In contrast to other social welfare programs that assist poor Americans, the rationale behind this feature of social security was that a full-time minimum wage worker should be eligible for retirement benefits sufficient to maintain an "above-poverty" standard of living. Income assistance programs for younger adults generally peg benefits to below-poverty threshold levels as an employment incentive on the assumption that "climbing" out of poverty should be a function of work effort rather than a consequence of social welfare. Ironically, since the US minimum wage has historically been insufficient to raise a full-time worker above the poverty line, this redistributive aspect of Social Security has been criticized as inconsistent with the insurance principles on which the program was founded.

Although the formula is designed to replace a declining proportion of average earnings for more highly paid workers, the benefit framework also incorporates features of an earned insurance-based entitlement program: benefits are linked to average monthly earnings, which reflect the tax contributions made to the program. The difference between this benefit framework and the one enacted in 1935 is that the benefits are not a simple and direct function of contributions made over the working lifespan. Rather, since the mid-1970s benefits have been stabilized relative to replacement rates in an effort to reduce inequality across successive cohorts of beneficiaries. Benefits also depend on the worker's retirement age and are actuarially reduced for retirements that occur before the "normal" retirement age and increased for those who delay retirement beyond this age. Set at age 65 in the initial legislation, the 1983 amendments gradually increased the age of normal retirement to age 67

by 2022 (42 U.S.C. §416(1)) and allowed actuarially reduced benefits for retiring as early as age 62. Workers who delay retirement receive an annual 8 per cent benefit increase for each year they delay (42 U.S.C. §402 (q)(w)). These actuarial adjustments represent an effort to ensure that retirees sharing an earnings history will receive, on average, the same total lifetime benefits regardless of when they retire; hence, those who retire earlier receive lower monthly benefits for (what is expected to be on average) a longer period of time; those who retire later receive higher monthly benefits for (what is expected to be on average) a shorter period of time. But since these calculations are necessarily made prospectively, this approach to equity issues obtains at the population level rather than the person level. As a collective insurance program, Social Security does not promise that any *specific* worker will receive all that he or she contributed plus a “fair” rate of return. Instead, it promises that each worker/retiree will be treated according to the rules of entitlement, each treated equally relative to the terms of the program. These are the sorts of differences in equity principles that lead to differing views of the “fairness” of Social Security.

With an average benefit value of \$1,079 per month,⁷ a range of \$637 (SSI payment to an individual in 2008) to \$2,185 per month (maximum benefit for a worker retiring at full retirement age – age 65 and 10 months – in 2008), the distribution of benefits is unusually compact for an income distribution. It has a truncated left tail defined by the minimum benefit – but also a truncated right tail – defined by the maximum benefit. Benefits received are arrayed fairly tightly around the mean value. The absence of the lower tail trailing to zero or even worse, into debt is by design: in setting Social Security’s benefit structure, an important goal was to make it possible for low-wage long-term workers to avoid poverty in old age. One way to pay for that redistribution was also to truncate the right tail. How well is it meeting that goal?

By the last quarter of the 20th century, the goal of avoiding poverty was being met quite well (U.S. Census Bureau 2006). The proportion of people aged 65 and older who were poor declined precipitously from

about 1966 to 1973 (when benefits were increased and indexed to the changing cost of living) from more than one-in-four people to about 15 per cent. A subsequent reduction through 2000 dropped the percentage poor to approximately 10 per cent, where it has remained. When we look at different age groups within the older population, poverty rates increase with age. The rates are lowest among those 65–69, highest among those 80 and older. Older women are at higher risk of poverty than men, particularly women aged 75 and older, in part because they are more likely to be unmarried. For example, approximately 14 per cent of women aged 75–79 are in poverty – about twice the rate for men. Because of this disparity, some policy analysts (e.g., Burkhauser 1990; Hardy and Hazelrigg 1993) have argued that Social Security benefits for surviving spouses should be reconfigured: a decline of one-third to one-half in benefits is too steep, particularly for those who rely on Social Security as the primary source of retirement income.

The near-poverty statistics show how fragile the non-poverty status is for many older people. If we consider the poor and the near-poor by including those whose incomes are below 125 per cent of the poverty line, we see the same general pattern but higher proportions. Including the nearly poor adds another 5 to 10 per cent to the figures cited above, with 20 per cent of those 80 and older poor or near poor.

Employer Sponsored Pension Plans

Unlike Social Security, participation in employer sponsored pension plans (ESPP) is not a government mandate. Some employers offer pension plans as a fringe benefit to their employees. The government’s role in private sector plans is via the regulatory provisions of the Employee Retirement Income Security Act (ERISA) of 1974 and tax incentives for both employer and employee contributions that are outlined in the internal revenue code. Within the public sector, the government-as-employer offers pension plans to government employees. Although defined benefit (DB) and defined contribution (DC) plans are the main categories of ESPPs, many hybrid plans have been developed in recent years.

⁷ This is the estimated average monthly social security benefit payable in January 2008 for all retired workers; for aged couples in which both are receiving benefits, the average is \$1,761; for aged widow(ers) alone, \$1,041 (Social Security Administration 2008).

Traditional DB plans were prevalent in the manufacturing industry and developed most rapidly during the middle decades of the twentieth century. They became a focus of collective bargaining in the middle of the century, particularly during periods of wage and price controls. Benefits in these plans are typically a straightforward function of wage-rate and seniority, with benefit claims triggered by completion of a vesting period. Conceptualized as a category of wealth, DB pensions provide retirees (and their surviving spouses when such benefits are elected) with a lifetime annuity that can be prospectively valued on the basis of expected retirement age, expected benefits and average life expectancy and reported as the discounted present value of lifetime benefits received. Similar to Social Security, the equity principle behind benefit income distribution treats benefit claims within a common framework of entitlement and calculation. Workers face uniform vesting requirements and the benefit structure rewards years of service in a predictable way, incorporating differences in wage rates across job categories and continuing benefit payments until the death of the retiree or in the case of survivors' benefits, the retiree's spouse. Differences in benefit levels within job categories (and therefore a subset of wage grades) were relatively minor. More important in explaining variation in benefit payments were age at retirement, years of service and whether the retirement was through "normal" channels or in response to an early retirement incentive package (ERIP).

ERISA played an important role in the evolution of DB plans by regularizing vesting options, defining non-discriminatory pension rules, developing a federal pension insurance program – the Pension Benefit Guaranty Corporation – funded by plan premia and requiring routine reporting of plans' financial status according to pre-determined accounting rules for calculating plan liabilities (as the cost of paying all promised benefits) and plan assets (as the value of the employer-managed pension fund). In establishing minimum funding standards ERISA was designed to increase the likelihood that workers (as future retirees) and current retirees received the benefits they were promised. As a form of deferred wages, DB plans rely on workers' agreement to a compensation package that includes wage-and-salary income as well as claims to other sorts of benefits, including health, life and disability insurance, as well as pensions.

Although participation in the aforementioned insurance programs generally cease upon the termination of employment,⁸ pensions were designed as earnings replacement mechanisms, therefore, employers were responsible for making all necessary contributions to and effectively managing the firm's pension fund to ensure sufficient assets to pay promised benefits. In the case of employer bankruptcy, plan liabilities are assumed by the PBGC, which takes over the payment of promised benefits up to a maximum benefit value. In administering defunct DB pension plans, the PBGC thereby ensures the continuation of benefits to low and mid-level earners but truncates the distribution of benefit amounts at a specified maximum. Retirees whose benefits had exceeded that maximum and workers who had expected benefits in excess of the maximum must accept less.

Defined contribution (DC) plans refer to a variety of mechanisms, including most commonly 401(k) and its 403(b) counterpart but also profit sharing and employee stock ownership plans. Individual Retirement Accounts (IRAs) share features with DC plans but are available to workers directly rather than through employer sponsorship. DC plans promise a rate of contribution (relative to the pay level) to an employee's personal account, with the level of retirement benefits being determined by the value of the account when the employee retires or begins to draw benefits. DC plans are also voluntary plans and not all those who are eligible to participate choose to do so. Since many such plans require employees to make contributions, the employer contribution is often framed as a match up to some specified contribution limit. Tax regulations limit how much employees may contribute in pre-tax dollars to their pension accounts. In addition to deciding whether to participate and how much to contribute, workers are responsible for making investment decisions and determining when and how to withdraw their funds, subject to some general federal regulations.

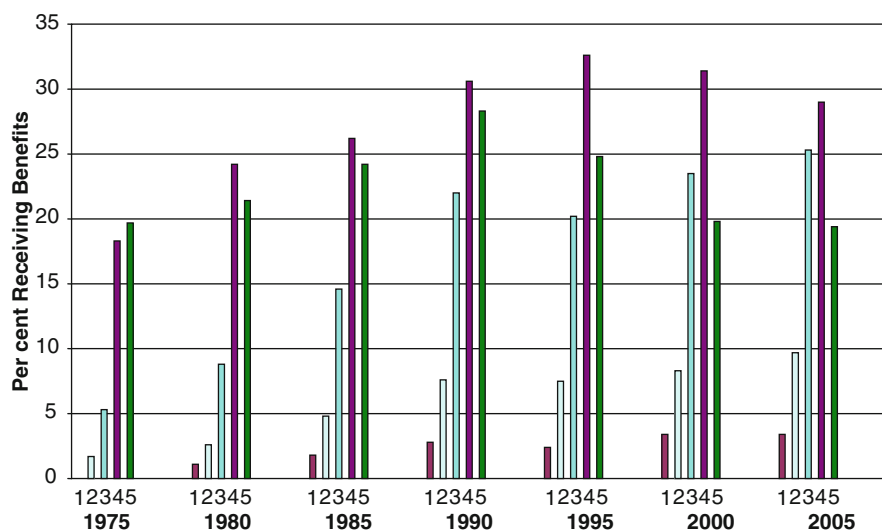
Hybrid plans combine some features from both types of plans and strike a somewhat different balance between portability, flexibility and control on the one hand and risk, predictability and security

⁸ A number of plans also promised the continuation of health insurance to retirees, although the rising cost of health insurance has prompted many employers to require retirees to pay part of the cost for continued coverage or for employers to drop the promise of health care coverage altogether.

Fig. 22.6 Per cent receiving employer-sponsored pension benefits by income quintile, 1975–2005

Source: EBRI Databook on Employee Benefits, Chapter 8: Retirement Annuity and Employment-Based Retirement Income. Table 8.3. Percentage Receiving Retirement Annuity and/or Employment Based pension Income Reciprocity, Males and Females.

[http://www.ebri.org/pdf/publications/books/databook/DB.Chapter per cent2008.pdf](http://www.ebri.org/pdf/publications/books/databook/DB.Chapter%20per%20cent2008.pdf)



on the other. Cash balance (CB) plans, for example, define individual accounts that are credited with regular contributions but also guarantee a rate of interest on account balances. Although CB plans are classified as DB plans for regulatory purposes, they are similar to DC plans in that the rate of return can be set by the employer and reflect the fund's actual performance.

The proliferation of different types of ESPPs is tempered by the fact that the percentage of workers covered by such plans has barely exceeded fifty per cent. Private sector coverage increased rapidly during the third quarter of the 20th century but reached a plateau when half the work force had been covered and after small downward and upward fluctuations in the 1980s and 1990s, declined to the current proportion of less than half of U.S. workers. As coverage rates were stagnating, the nature of pension coverage was shifting from predominately DB to DC plans. For example, in 1975, 87 per cent of workers with pension coverage participated in a DB plan but by the end of the century, the number of workers covered by DB plans dropped 25 per cent while the number participating in a DC plan rose by 250 per cent (Copeland 2005). Currently only 19 per cent of U.S. households participating in an ESPP are covered by a DB plan, compared to 58 per cent coverage under DC plans and 23 per cent of participating households enrolled in both DB and DC plans (Munnell and Sunden 2004).

It is true that Social Security was designed to be one of three sources of income in old age, the others being employer-sponsored pension income and asset income

(and earnings, if you add a fourth). Although pension income is important for many households, coverage by employer sponsored pensions appears to have stagnated and the pension landscape has been changing in important ways.

Defined benefit plans that promised benefits (in proportion to years of service, wage rate and age of retirement) in exchange for loyalty and some amount of wage deferral are disappearing. In fact the growth curve for defined contribution plans (in which employers promise to make routine deposits usually in proportion to wage/salary) mirrors the decline in defined benefit plans. Although more than one-in-four workers were covered by only a defined benefit plan in 1980, that proportion had declined to about one-in-sixteen (or perhaps twenty) by the turn of the century. Approximately 15 per cent of workers are covered by both a defined benefit and defined contribution plan and that has remained fairly steady. But the proportion covered by only a defined contribution plan has nearly quadrupled in the same period of time and is now approaching 30 per cent.

DC plans (primarily 401(k)s and 403(b)s) are individualized accounts, which must be invested by their owners – individual workers. This type of account appears to be one model for the privatized accounts being promoted as Social Security's replacement, and the investment experiences of individuals with these accounts (sometimes including IRAs, as well) have provided much of the insight into how the general working public will fare in this environment of *privatized* versus *social* security.

Unlike Social Security, access to pension benefits favors middle and higher income workers. In contrast to the 91 per cent receipt of Social Security benefits, only 35.5 per cent of those 65 and older receive income from pensions and annuities (EBRI 2007). As Fig. 22.6 demonstrates, access to pensions among those in the lower and middle income quintiles has grown little, registering very low levels in 1975 (0 per cent, 1.7 per cent and 5.3 per cent for quintiles 1, 2 and 3, which includes 60 per cent of the population). Even though rates of entitlement almost quintupled in the middle quintile, allowing the middle quintile to catch up to the higher income quintiles, rates for the lower income quintiles remain in single digits. Among the middle and higher quintiles, coverage has actually declined from high points reached in the 1980s and 1990s.

In spite of expansions in receipt of pension benefits among those in the lowest three income quintiles, their share of aggregate pension income has remained relatively stable at about one dollar out of every five (the exception was in the 1980s, when their share rose to 27 per cent). The highest income quintile has corralled more than half of aggregate pension income, again except for 1985 when their share was a mere 49 per cent. This distributional dominance has occurred despite expanded receipt because of the trends in median pension benefits received by quintile. Even among those receiving benefits, the typical amount is quite modest among the bottom 60 per cent, averaging about \$4300 annually for the middle quintile and roughly half that in the lowest two quintiles. In contrast, median benefits in the top 2 quintiles have roughly doubled during the 30 year period. By 2005, the lucky but few beneficiaries in the two lowest quintiles received about \$200 per month, those in the middle quintile received about \$365 per month, while those in the fourth quintile averaged \$1,000 and those in the highest quintile \$2,000 per month.

An important aspect of this inequality in pension benefit receipt and benefit amount is the uneven availability of ESPPs by occupation and industry. Lower-income workers are much less likely to have coverage through their jobs and those who do have coverage on one job are less likely to be able to sustain coverage over their careers. Lifetime benefit coverage – coverage that may be continuous or episodic – adds to variability in levels of pension benefits. Episodic coverage may lead to entitlement but the level of pension benefits is highly sensitive

to wage rate and years of employment (or years of contribution). Low and modest-wage workers must accumulate benefit claims through continuous tenures to have reasonable benefits in old age. [reference Chapter 19]

Income from Assets

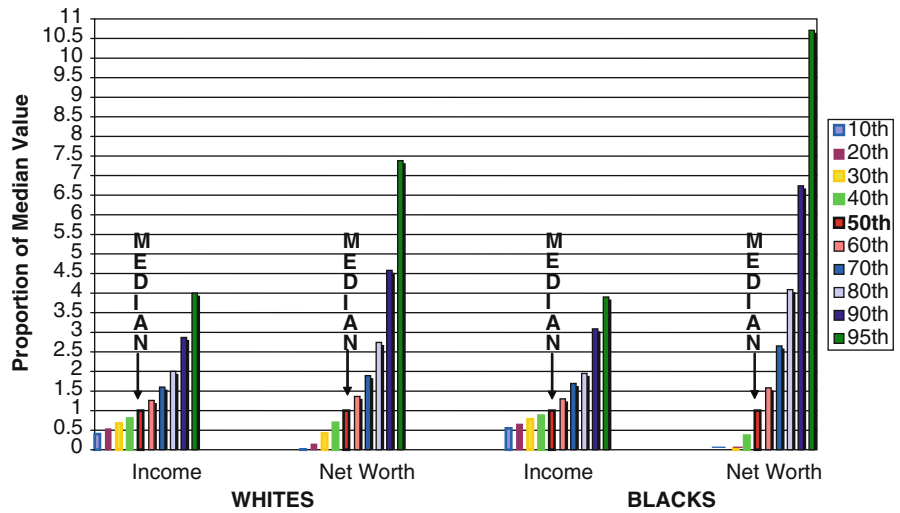
Although almost 60 per cent of people aged 65 and older receive income from assets, the distribution of asset income – a reflection of the distribution of wealth – is more concentrated than pension income, Social Security, or earnings. Until 2005, pension income represented an increasing proportion of total annual income among the older population; the proportion of annual income contributed by pensions was also higher for those aged 65–74 than for those older than 74. In contrast, the proportion of total annual income from assets tends to increase with age. Those aged 85 and older rely more on asset income than those in their 60s and 70s but among all age groups 65 and older, this proportion has declined in importance since the mid-1980s (EBRI 2007). The inequality of financial assets is also apparent when we look at race/ethnic differences.

For households including someone aged 70 or older, Smith (1997) used data from AHEAD to illustrate differences in the inequality of income and net worth by race. According to his estimates, mean net worth for all households was just shy of \$165,000, with 40 per cent being held in home equity. Average wealth for black households was only 26 per cent that of white household wealth, with Hispanics households holding somewhat more wealth than blacks but still reporting only one-third the net worth of white households. Although home equity was lower for minority households, disparities in financial assets were larger, with minority households holding only \$1 for every \$10 held by white households.

Figure 22.7 allows us to compare income and wealth inequality for whites (on the left) and for blacks (on the right). The inequality measure used in this analysis is based on the median value, which is \$77,800 (less than half the mean value, which in itself suggests a highly skewed distribution). By expressing the median value for a given percentile as a proportion of the overall median for whites or for blacks, we

Fig. 22.7 Comparison of income and net worth inequality: percentiles relative to median, by race, based on AHEAD

Source: Figures from Table 7, James (1997).



can compare how inequality of income and net worth differ within racial groups. A few points are noteworthy. First, although the poorest quintiles register average income at about half the median value, the net worth of the lowest white quintile barely registers and the net worth of the lowest two black quintiles fails to rise above zero. Second, the richest quintile has income four times the median value; however, it has net worth more than 7 times the median value. Among blacks, the income disparity is about the same: highest income blacks have about four times the median income for blacks. But the wealthiest black house-

holds have net worth more than 10.5 times the median net worth for blacks.

What this figure does not illustrate is the racial difference in net worth. Figure 22.8 shows us how net worth is distributed by percentile and allows us to view how white, black and Hispanic households fare relative to the population averages. The wealthiest black and Hispanic households roughly correspond to white households in the 70th percentile. A second method of viewing the discrepancy between white and black households is to express average net worth by quintile in black households as a proportion of median net

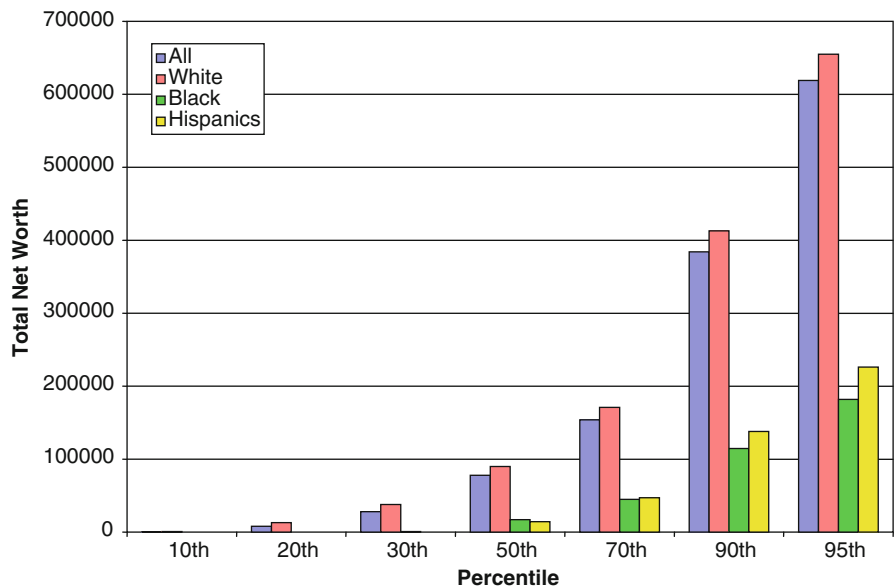
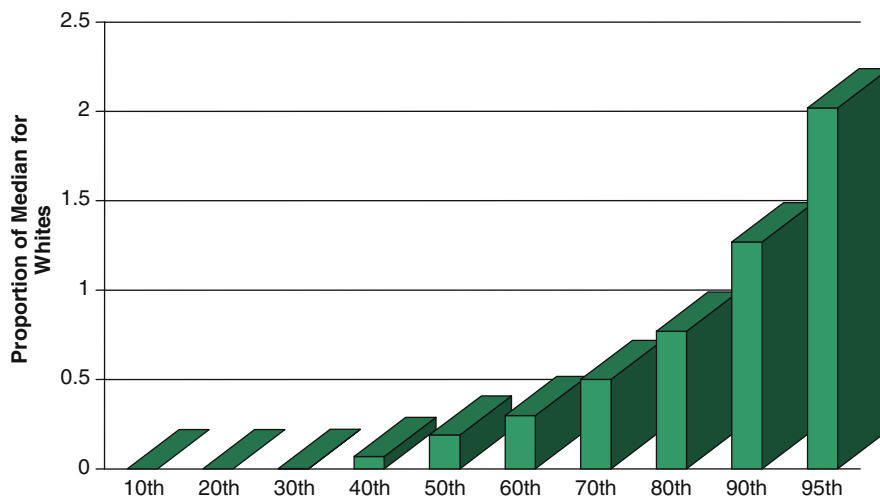


Fig. 22.8 Percentile distribution of total net worth, AHEAD

Source: Figures from Table 6, James (1997).

Fig. 22.9 Net worth inequality: percentiles for blacks relative to median for whites, based on AHEAD
Source: Calculated from Figures in Table 7, James (1997).



worth characteristic of white. When we do so, as in Fig. 22.9, the picture is quite different. Those at the 70th percentile among black households register net worth that is half the median value for white households. Those in the 90th percentile of black households have approximately 25 per cent more net worth than those at the median of white households and those in the 95th percentile have a net worth approximately twice that of the white household median.

Although assets are not a straightforward function of income,⁹ earnings income and household income distributions tend to be more compact for nonwhites, concentrated around significantly lower mean and median values. For example, in 2006 median household income was \$50,673 for whites, \$31,969 for blacks and \$37,781 for Hispanics and whereas one-in-five white households had income in excess of \$100,000, only 9 per cent of blacks and 10 per cent of Hispanics were similarly situated. Instead, almost 16 per cent of black households had income under \$10,000 compared to 6.2 per cent of whites and 9.2 per cent of Hispanics (DeNavas-Walt et al. 2007). Among full-time year-round workers, black men earn about 72 cents on the dollar (about two cents less than white women) compared to white men and Hispanic men only 58 cents (U.S. Census Bureau 2007). These earnings and household income disparities are averaged across cohorts. Those who are currently in their 60s faced a less favorable

earnings environment as younger workers than currently exists. Asset differences at older ages are one manifestation of these economic disparities.

The intergenerational transmission of wealth also factors into wealth inequality. Based on the PSID, a recent study compares the asset holdings of parents and their children and documents substantial intergenerational persistence in wealth¹⁰ even among households who have not yet received bequests from their parents. This persistence is in large part a function of the extremes. Children of parents with very little wealth or with very high wealth tend to occupy the same situation as their parents, primarily because the incomes of the children are comparable to their parents' incomes. In addition, shared saving behavior and similar portfolio allocations are attributed to learned (or mimicked) behavior rather than to the intergenerational correlation in preferences for risk (Charles and Hurst 2002).

Wealth also can be transmitted through bequests. Analyzing exit interviews from AHEAD, Hurd and Smith (2002) reported that 30 per cent of deceased respondents had estates of no value; the median estate was \$62,000; and only 3 per cent of estates exceeded \$600,000. Because of this very skewed distribution, bequests generally exacerbate already high levels of income and wealth inequality. Gale and Scholz (1994) reported that bequests accounted for approximately 30 per cent of total wealth

⁹ Researchers have documented that households with similar lifetime earnings are characterized by highly variable amounts of wealth (Venti and Wise 2001).

¹⁰ They estimate the age-adjusted elasticity of child's wealth to parents' wealth at 0.37 (Charles and Hurst 2002).

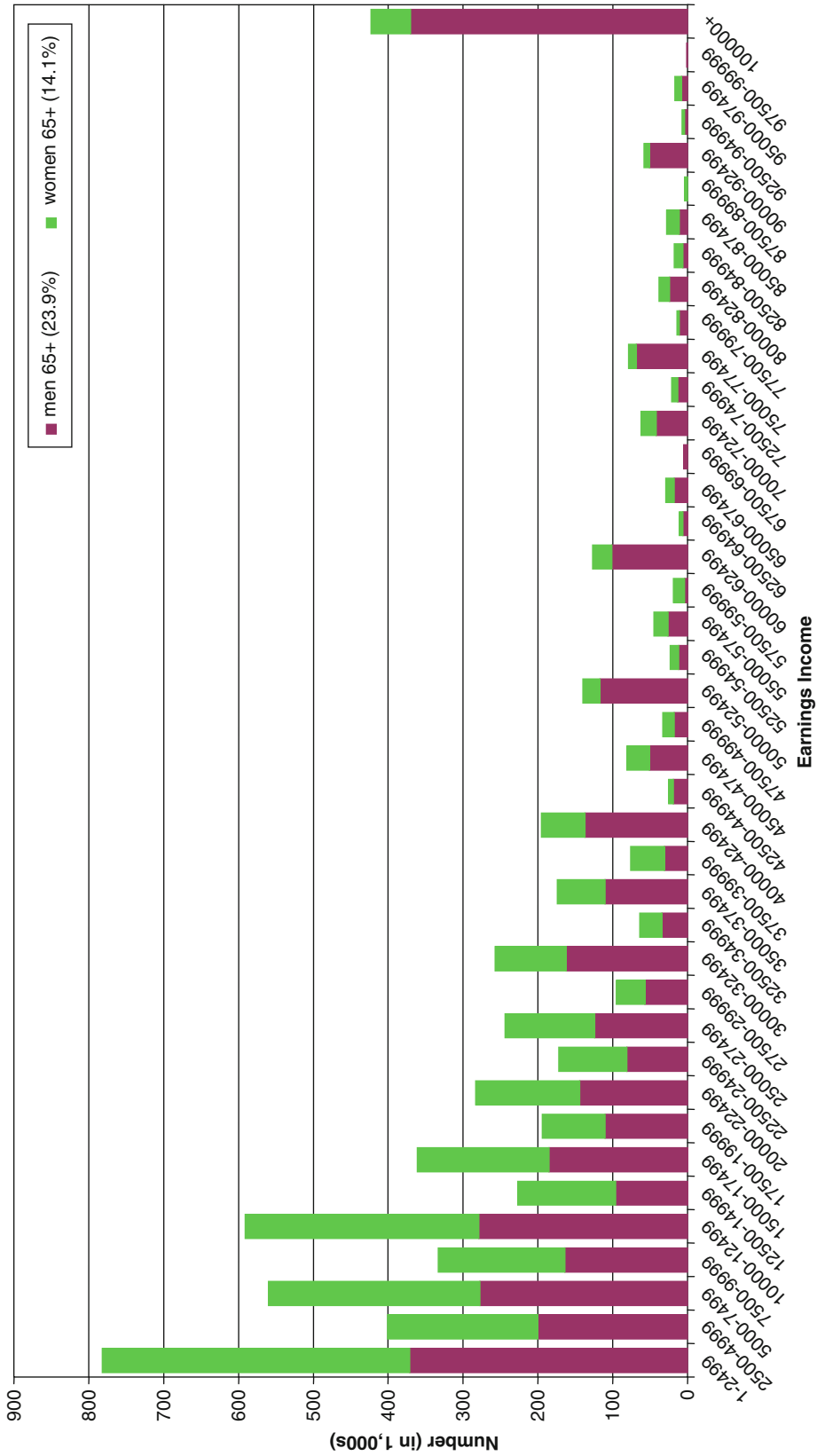


Fig. 22.10 Earnings distribution for those 65 and older by sex, 2005
 Source: U.S. Census Bureau Current Population Survey, 2006 Annual Social and Economic Supplement, PINC-08. Source of Income in 2005 for people 15 years old and over by income of specified type in 2005, age race, Hispanic origin and sex.

accumulations and inter-vivos transfers added another 20 per cent to total accumulations.

Earnings

Policy changes at the federal level have made it clear that people are expected to work longer, delay benefit entitlement beyond the age of earliest eligibility, or at least maintain some attachment to the labor force so they may supplement income from earnings-replacement programs with actual earnings. Although in 1975, earnings comprised close to one-third of the average annual income of those 65–69 – dropping to 10–15 per cent for those in their 70s – the importance of earnings for those aged 65 and older has grown significantly. By 2005, earnings represented more than 40 per cent of the average annual income of 65–69 year olds, 24.1 per cent for 70–74 year olds, 15.9 per cent for 75–79 year olds and 8.7 per cent for those aged 80–84 (EBRI 2007) [reference Chapters 20 and 21].

Figures 22.10 and 22.11 reveal the increased prevalence and importance of earnings income among older households by illustrating the distribution of earnings for men and women aged 65 and older (Fig. 22.10) and 75 and older (Fig. 22.11). Among those 65 and older, men are much more likely to report earnings than women – about one-in-four men compared to about one-in-seven women. The frequency is lower for those 75 and older – a bit more than one-in-nine men versus one-in-seventeen women. Distributions for both age ranges are positively skewed, with the majority of earnings reports at the lower end of the distribution. Men’s earnings outpace women’s earnings for those 65+ and 75+. Women’s earnings are more concentrated in the lower range than men’s earnings, which is reflected in the median income for the 65 (75) and older men of \$21,681 (\$13,765) compared to \$12,660 (\$10,145) for women. Although the number of earners declines as earning levels rise, both age ranges show a sizeable jump for earnings higher than \$100,000 for men. In fact, among those 65 and older, the prevalence of earnings in excess of \$100,000 is about the same as for earnings below \$2500. Men’s earnings also display more inequality, with Gini coefficients of 0.606 (0.648) for men 65

(75) and older compared to 0.533 (0.553) for comparably aged women. Because these figures do not standardize for hours worked, differences in hours worked per year and weeks worked per year are confounded with differences in wage rates.

Composition of Annual Income in Old Age

We’ve reviewed specific aspects of the four major sources of income in old age: Social security, pensions, income from assets and earnings. Additional sources such as public assistance – supplemental security income for older persons – provides some additional financial support for the older poor but the majority of older persons rely on the four sources discussed above. However, how these four sources factor into total income differs by how much income the person or household receives (Rubin et al. 2000). In addition to age and occupation, marital status and gender are important stratifying variables in old age. Disparities in old age that correlate with gender and marital status are similar in many ways to the disparities we see at younger ages. Since women remain disadvantaged in the labor market, the wage rates they command, the pension plans they can access and the assets they accumulate are not on parity with what men experience. Couples experience better financial circumstances, are able to pool resources and make strategic decisions to maximize their joint situations and plan collaboratively for a better future. However, because of the rates of remarriage after divorce, women’s longer life expectancy and the typical age difference between spouses, women are much more likely than men to spend some part of their old age alone. Women are also more likely to experience poverty in old age, with non-married or widowed women of minority status having particularly high risk for old age poverty.

We can begin by looking at Figs. 22.12 and 22.13, which show differences in the composition of income by income quintiles for married couples (Fig. 22.12) and non-married persons (Fig. 22.13). Turning first to the description of married couples, we note that the third quintile has an upper limit of \$42,129, which means that 60 per cent of married couples have an annual income below that. The highest quintile has

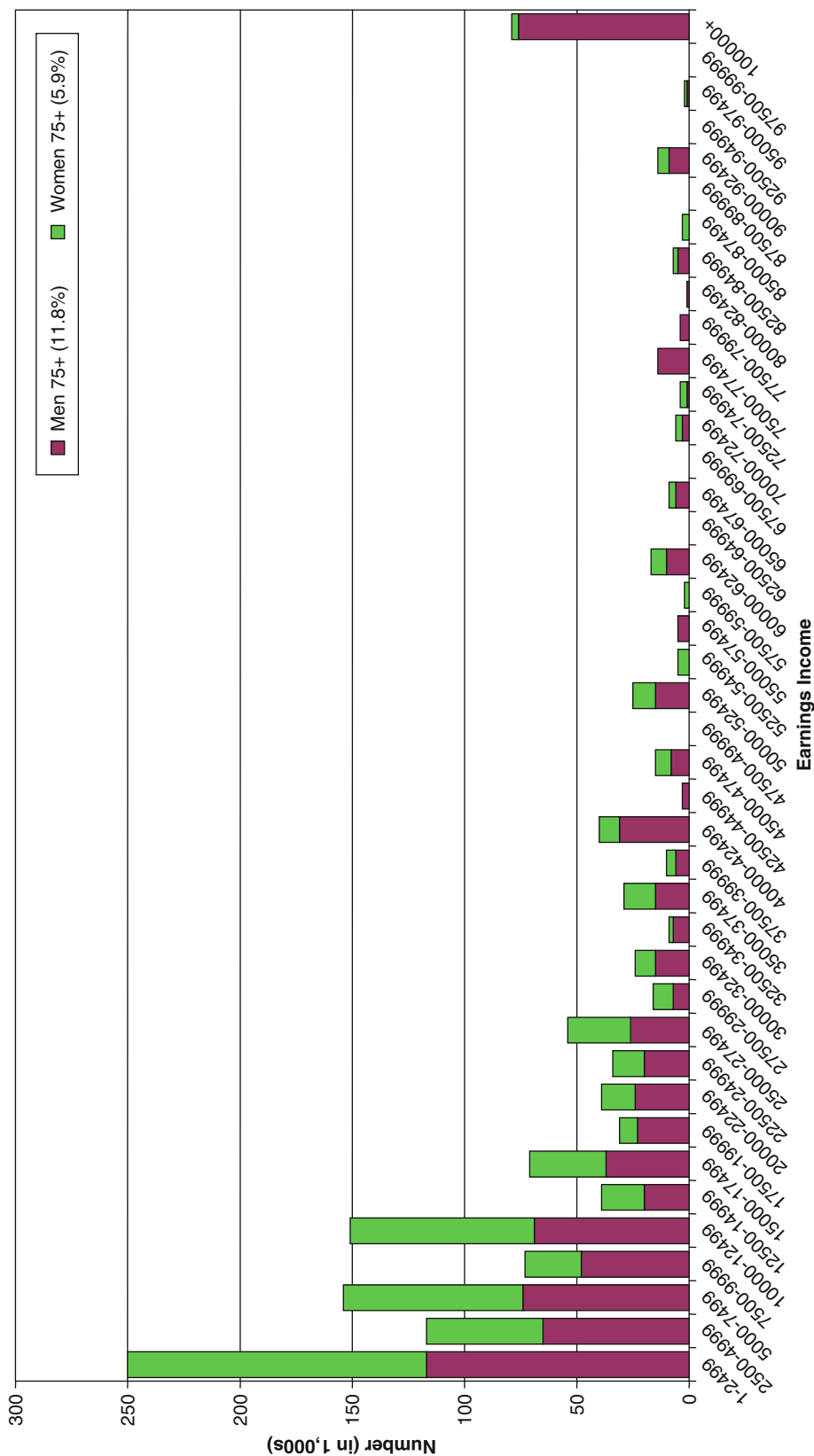
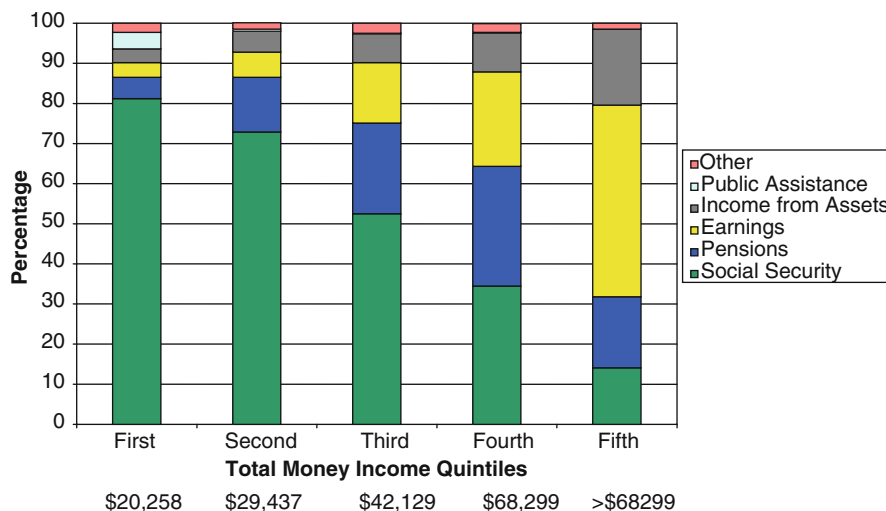


Fig. 22.11 Distribution of earnings for 75 and older, by sex, 2005
 Source: U.S. Census Bureau Current Population Survey, 2006 Annual Social and Economic Supplement. PINC-08. Source of income in 2005 for people 15 years old and over by income of specified type in 2005, age race, Hispanic origin and sex.

Fig. 22.12 Percentage distribution of income sources for married couples. Source: Social Security Administration (2006: 143). Table 7.5. percentage distribution by marital status and quintiles of total money income, 2004.



a lower limit of \$68,299, which means that only 20 per cent of older married couples have annual incomes of this amount or higher. Social Security provides 80 per cent of annual income for the lowest quintile, declining in magnitude but remaining above 50 per cent through the third quintile, contributing approximately one-third of income to those in the fourth quintile and less than 20 per cent of income to those in the highest quintile. Pension income is more important to the third and fourth quintiles than for those in the lower quintiles, who are much less likely to qualify for employer sponsored pensions, or those in the highest quintile, who rely more on asset income. Note that households in all five quintiles receive some income from assets but the amount (and proportion) of income generated by assets differs substantially. Among those in the two highest quintiles, assets comprise about one-tenth to one-fifth of total income. But married couples tend to be in much better financial shape than non-married persons.

For non-married persons (which include those widowed and divorced), the income limits that define the five quintiles are less than half what they were for married couples. In fact, the upper limits for the first three quintiles (including 60 per cent of non-married persons) are lower than the limit for the first quintile among married couples. Unmarried persons with the highest incomes are the twenty per cent who have \$26,064 or more on an annual basis. Given the lower level of overall income, it isn't surprising that Social Security looms larger for singles: 80 per cent or more through the first three quintiles. It comprises the high-

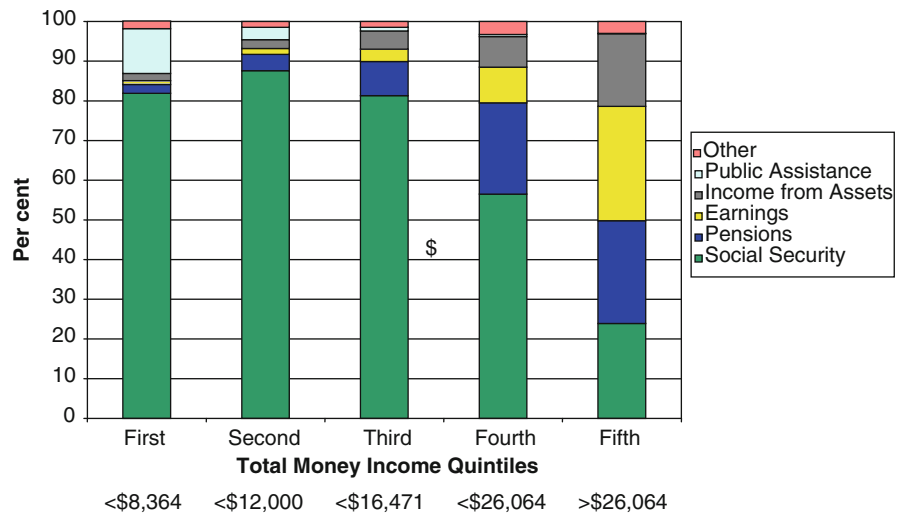
est proportion for the second quintile rather than the lowest quintile, largely because more in the lowest quintile rely on public assistance. The highest quintile receives roughly equal proportions from Social Security, pensions, earnings and asset income, with earnings being the largest of the four.

Comparisons with OECD Countries

Much of what we know about income inequality in comparative perspective is based on the Luxembourg Income Study (LIS), which collects information on a common set of income and employment measures from a range of countries in Europe, North America and elsewhere (Smeeding 1997). Because of that comparative perspective, it is possible to address how country differences in earnings and retirement income policies are translated into different levels of inequality in old age. Since government benefits are generally more progressively distributed than market based benefits, countries that handle earnings replacement primarily through government based programs are characterized by lower levels of income inequality in old age.

Figure 22.14 displays Gini coefficients by age group by country for seven OECD countries. This chart makes clear that the U.S. has the highest rates of inequality across the age groups. For the U.S., inequality peaks within the 55–64 age range and then drops for the oldest age groups. Even the lowest Gini coefficient for the United States is higher than for the other

Fig. 22.13 Percentage distribution of income sources for non-marrieds.
Source: Social Security Administration (2006: 143). Table 7.5 percentage distribution by marital status and quintiles of total money income, 2004.



countries with the exception of the United Kingdom, whose rates are closest to those of the U.S. That the age range of 55–64 is characterized by relatively high rates of inequality is not an unusual pattern for this set of countries, although for some countries (e.g., the United Kingdom and Sweden), inequality begins to decline in the 60–64 age range (Prus and Brown 2006). When income is arrayed across quintiles, we see more of the comparative structure of inequality across countries. The proportion of income captured by the lowest quintile is unusually small in the U.S. and the proportion of income captured by the highest quintile is unusually large in the U.S. This pattern holds across all age groups.

Further, when we address the composition of income to compare the proportion of total income contributed by earnings, investments, pensions and government transfers, we gain another perspective on income inequality across five age groups – those aged 45–54, 55–59, 60–64, 65–74 and 75 and older. Occupational pension income increases with age for all countries but the proportion of income contributed by occupational pensions is particularly high in the Netherlands and Canada. Investment income increases in importance in some countries (e.g., Canada, Germany, the United Kingdom and the United States), although the rate of increase in investment income is lowest for Germany and highest for Canada and the U.S. Earnings income is more important in the youngest (45–54) age group and drops off with age. Earnings remain a relatively large proportion of income in the U.S., accounting for more than one-fifth of house-

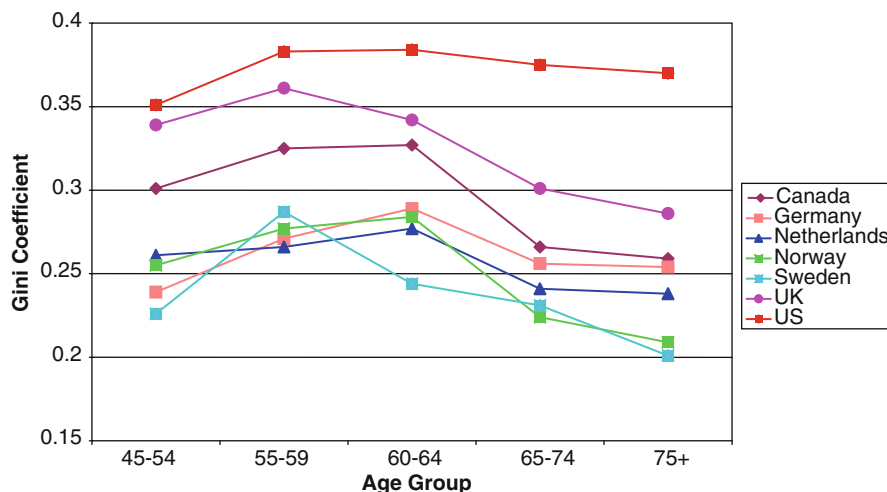
hold income even among those 75 and older. Earnings income drops off quite early, in relative terms, in the Netherlands and also in Sweden.

The final component, government transfers, is a particularly important component from the standpoint of income inequality, since this category of income is often distributed progressively, favoring lower income households somewhat more than higher income households. The proportion of income contributed by government transfers is lowest for the U.S. in all age groups. After age 65, the role of transfers increases significantly in all countries and it plays a more important role for those aged 75 and older than among those aged 65–74. In Germany, Norway and Sweden, government transfers contribute two-thirds to three-quarters of total income. Only among those 75 and older in the U.S. does government transfer income become the major income source.

The relatively low rates of inequality in Sweden and Norway reflect the relatively high levels of government transfers. In general, researchers have identified a strong negative correlation between the level of government sponsored retirement income and income inequality. In Sweden, the government provides about 70 per cent of retirement income. In addition, in Sweden and Norway, income tends to be redistributed from the highest income quintile to all the lower quintiles. In contrast, in Canada, the Netherlands and the United Kingdom income from the highest quintile is redistributed to the lowest quintile in a much more targeted way.

In contrast to lower income countries, which tend to rely more on informal arrangements as they develop

Fig. 22.14 Gini coefficients of disposable household income for selected countries, by age of household head
Source: Table 2. Prus and Brown 2006.



programs of social protection, OECD nations all tend to have well-developed social institutions. Even so, OECD countries differ in how these institutions operate and how much emphasis is placed on redistributive policies. The largest programs address the problem of wage replacement and include contributory social insurance programs such as old-age pensions and unemployment benefits. Social protection programs typically include three categories of assistance: (1) pensions and survivors' benefits; (2) income support for working-age adults experiencing a loss of earnings (e.g., disability, occupational injury, unemployment); and (3) public health expenditures and other social services (to the elderly, disabled, families-in-need and workers). Among OECD countries, the average amount spent on cash transfers is double the amount typically spent on in-kind services. In addition, as populations age, the composition of assistance shifts more toward the older portion of the age distribution and the costs rise, a factor which has precipitated a reexamination of these programs in many countries.

Within OECD countries, we find substantial variation in the level and composition of spending on social protection programs. Continental European countries exhibit considerable reliance on social insurance with a strong safety net (SSN) based on universal and relatively generous family benefits and means-tested programs for the poor as a last resort. In contrast, what has been labeled the "Anglo-Saxon model" (ASM) in the United States, United Kingdom, Australia, New Zealand and Canada relies less on social support, more on market-based approaches and targeted means-tested programs for the "deserving" poor – an approach that reduces the amount of redistribution accomplished by these programs. The

relative merits of these different approaches have been long debated in academic, political and social settings. In dispute is which model better addresses the problem of poverty (which European countries tend to define in relative terms as a proportion of median income and the ASM sets relative to absolute poverty thresholds), fuels economic growth, reduces work disincentives, achieves efficiencies and discourages dependency.

A recent study (Alesina and Glaeser 2004) reported that the variation in the size of the "welfare state," exhibited most starkly by the group difference in SSN and ASM expenditures, cannot be attributed to economic factors such as pre-tax income or wage inequality, the efficiency of the tax bureaucracy, status mobility (e.g., the likelihood that the poor can achieve middle class status), or a general willingness to help people in need (support for altruism versus selfishness). Instead, they argue the social welfare "expenditure gap" is better explained by differences in political institutions (e.g., distribution of political influence, checks and balances, political representation), racial diversity coupled with racial fractionalization and popular beliefs about why poverty exists (e.g., individual versus structural explanations).

Summary

Income inequality at older ages is a reflection of previous life experience – the choices and opportunities, successes and failures, best laid plans and lucky (or unlucky) surprises that combine to form the content of our lives. As research on aging, income and inequal-

ity has accumulated, we have gained a better understanding of how early life advantages often (though not always) lead to advantages in adulthood, midlife and old age; how economic advantages reflected in higher incomes are linked to other forms of economic advantage, such as wealth and pensions; and how resource rich environments can produce advantages in other domains, such as education, health and cognitive skill. These threads not only connect across stages of the life course but across generations, allowing parents and grandparents to shape (but not determine) the futures of their offspring. All of these connections are facilitated or inhibited by a complement of economic, political and social processes that protect advantage or redistribute resource, emphasize personal versus structural factors, view social protection as constructive versus obstructive, differentially balance markets with government interventions and progressive with regressive policies. Although U.S. folklore extols upward mobility – the opportunity for hard-working people to better their positions – as the norm, empirical evidence has demonstrated that the intergenerational transmission of status is at least as strong in the U.S. as it is in other nations. These pathways of transmission can be as obvious as bequests – large fortunes or small nest-eggs – that flow to younger generations, or they can be more subtle, as in the perspective one holds for the future, how deeply one discounts tomorrow in favor of today, or the limitations and injuries one must carry from less advantaged yesterdays.

Survival to old age is an outcome predicted by early advantages or by beating the odds and overcoming early drawbacks: the former path is the more common one. Similarly, living well in old age is an outcome predicted by beneficial endowments – being born into a family with higher than average income; receiving better than average education, health care and sponsorship; securing a better than average job (with the salary, fringe benefits, job security and promotion ladder that implies) as well as good luck – avoiding catastrophic health events, poor investments, or major accidents. To study inequality in old age is to understand how people are sorted at birth, or one might argue in utero and how the potential that exists in these early days is developed or squandered. It is the study of processes, the macro-level environments that create or block openings through which these processes can flow and the personal abilities, temperaments and ambitions that do the same.

References

- Alesina A, Glaeser E (2004) *Fighting poverty in the US and Europe: A world of difference*. Oxford University Press, New York
- Burkhauser RV (1990) How public policy increases the vulnerability of older widows. *J Aging Soc Policy* 2(3/4):117–130
- Burkhauser RV, Giles P, Lillard DR, Schwarze J (2005) After death do us part: An analysis of the economic well-being of widows in four countries. *J Gerontol* 60B(5):238–246
- Charles, KK, Hurst E (2002) The correlation of wealth across generations. Working Paper 9314. National Bureau of Economic Research: Cambridge, MA
- Copeland C (2005) Employment-based retirement plan participation: Geographic differences and trends, 2004. Employee Benefits Research Institute Washington DC
- Corak, M (ed) (2004) *Generational income mobility in North America and Europe*. Cambridge University Press, New York
- Coulter PB (1989) *Measuring inequality: A methodological handbook*. Westview Press, Boulder
- Crystal S, Shea D (1990a) The economic well-being of the elderly. *Rev Income Wealth* 36:227–247
- Crystal S, Shea D (1990b) Cumulative advantage, cumulative disadvantage, and inequality among elderly people. *Gerontologist* 30:437–443
- DeNavas-Walt C, Proctor BD, Smith J (2007) Income, poverty, and health insurance coverage in the United States: 2006. *Curr Popul Rep* (August):P60–233
- Duncan GJ, Daly MC, McDonough P, Williams DR (2002) Optimal indicators of socioeconomic status for health research. *Am J Public Health* 92(7):1151–1157
- EBRI (2007) Data book on employee benefits. <http://www.ebri.org/publications/books/index.cfm?fa=databook>
- Feinstein JS (1993) The relationship between socioeconomic status and health: A review the literature. *Milbank Q* 71:279–322
- Gale Wg, Scholz JK (1994) Intergenerational transfers and the accumulation of wealth. *J Econ Perspect* 8(4):145–160
- Gottschalk P, Gustafsson B, Palmer E (ed) (1997) *The changing distribution of economic well-being - international perspectives*. Cambridge University Press, Cambridge
- Hardy M, Hazelrigg L (1993) The gender of poverty in an aging population. *Res Aging* 15(3):243–278
- Hardy M, Hazelrigg L (2007) *Pension puzzles: Social security and the great debate*. Russell Sage Foundation, New York
- Hausman DM, McPherson MS (2006) *Economic analysis, moral philosophy, and public policy*, 2nd edn. Cambridge University Press, New York
- Henretta J, Campbell R (1976) Status attainment and status maintenance: A study of stratification in old age. *Am Sociol Rev* 41:981–992
- Hurd MD, Smith JP (2002) Expected bequests and their distribution. NBER Working Paper 9142
- Jääntti M, Bratsberg B, Røed K, Raaum O, Naylor R, Österbacka E (2006) American exceptionalism in a new light: A comparison of intergenerational earnings mobility in the nordic countries, the United Kingdom and the United. IZA Discussion Papers 1938, Institute for the Study of Labor (IZA)

- Juster FT, Smith JP, Stafford F (1999) The measurement and structure of household wealth. *Labour Econ* 6(2):253–275
- Levy, F, Temin P (2007) Inequality and institutions in 20th century America. National Bureau of Economic Research Working Paper 13106
- Levy F (1998) *The new dollars and dreams: American incomes and economic change*. Russell Sage Foundation, New York
- Lum T (2004) Health-wealth association among older Americans: Racial and ethnic differences. *Soc Work Res* 28(2):105–116
- Munnell AH, Sundén A (2004) Coming up short: The challenge of 401(k) Plans. Brookings Institution Press, Washington, DC
- O’Rand A (2003) Cumulative advantage and gerontological theory. In: Crystal S, Shea D (eds) *Economic outcomes in later life: Public policy, health and cumulative advantage*, 2002 volume of the *Annu Rev Gerontol Geriatr* Springer Publishing, New York, pp 14–30
- O’Rand AM, Henretta JC. (1999) *Age and inequality: Diverse pathways through later life*. Westview Press, Boulder, CO
- Pampel F, Hardy M (1994) Changes in income inequality during old age. *Res Soc Stratific Mobil* 13:239–263
- Pampel F, Hardy M (1993) Status maintenance and change during old age. *Soc Forces* 73:999–1025
- Piketty T, Saez E (2003) Income inequality in the United States. *Q J Econ* 118(1):1–39
- Prus S, Brown R (2006) Income inequality over the later-life course: A comparative analysis of seven OECD countries. Luxembourg Income Study Working Paper Series, no. 435
- Robert S, House JS (1996) SES differential in health by age and alternative indicators of SES. *J Aging Health* 8(3):359–388
- Rodriguez SB, Diaz-Gimenez J, Quadrini V, Rios-Rull J-V (2002) Updated facts on the U.S. distributions of earnings, income and wealth. *Fed Res Bank Minneapolis Q Rev* 26(3):2–35
- Rubin RM, White-Means S, Daniel LM (2000) Income distribution of older Americans. *Mon Labor Rev* (Nov):19–30
- Slesnick DT (1992) Aggregate consumption and savings in the postwar United States. *Rev Econ Stat* 74(November):585–597
- Slesnick DT (1993) Gaining ground: Poverty in the postwar United States. *J Political Econ* 101 (February):1–38
- Smeeding TM (1997) Reshuffling responsibilities in old age: The United States in comparative perspective. Working Paper no. 153. Luxembourg Income Study. Syracuse NY: Syracuse University, Maxwell School of Citizenship and Public Affairs
- Smith JP (1997) Wealth inequality among older Americans. *J Gerontol, Series B*, 52B(Special Issue):74–81
- Smith JP (1998) Socioeconomic status and health. *Am Econ Rev* 88:192–196
- Social Security Administration (2008) Fact sheet: 2008 social security changes. Government Printing Office, Washington, DC
- Social Security Administration (2006) *Income of the population 55 and older, 2004*. SSA Publication No. 13-11871. Government Printing Office, Washington, DC
- Solon, G (2002) Cross country differences in intergenerational earnings mobility. *J Econ Perspect* 16(3):59–66
- US Census Bureau (2006) PINC-08. Source of Income in 2005: People 15 years old and over, by income of specified year in 2005, age, race, Hispanic origin, and sex. http://pubdb3.census.gov/macro/032006/perinc/new08_001.htm
- US Census Bureau. (2007) 2007 Annual social and economic supplement. Current Population Survey
- Venti SF, Wise DA (2001) Aging and housing equity: Another look. (NBER Working Paper No. W8608). Available at SSRN: <http://ssrn.com/abstract=291283>
- Weinberg DH (1996) A brief look at postwar U.S. income inequality. *Curr Popul Rep* P60–191 (June)
- Wenzlow A, Mullahy J, Robert S, Wolfe B (2004) An empirical investigation of the relationship between wealth and health using the survey of consumer finances. Institute for Research on Poverty, Discussion Paper 1287–1304
- Williams, DR, Collins C (1995) US socioeconomic and racial differences in health. *Annu Rev Sociol* 21:349–386
- Willson AE, Hardy MA (2002) Racial disparities in income security for a cohort of aging American women. *Soc Forces* 80(4):1283–1306
- Wolff EN (1995) *Top heavy: A study of the increasing inequality of wealth in America*. Twentieth Century Fund Press, New York

Part V
Population Aging, Longevity, and Health

Chapter 23

Mortality Patterns in Late Life

Robert A. Hummer, Richard G. Rogers, Ryan K. Masters and Jarron M. Saint Onge

Introduction

The thorough description and more complete understanding of older adult mortality patterns have become central and exciting areas in both demography and aging research in recent decades. Increasing numbers of people around the world, particularly in the most economically developed countries, are experiencing overall healthier and longer lives. Indeed, given its impact in nearly all countries, the general increase in life expectancy was arguably one of the most important trends of the 20th century. Increases in life expectancy – initially predominantly caused by decreasing infant and childhood mortality but now largely based on decreasing older adult mortality in high income countries – have also helped to produce greater numbers of people living into older adulthood. The growing size of the older adult population is a relatively new phenomenon in human history and has, in turn, created tremendous interest in the growth, health and mortality prospects of this rapidly growing segment of the population. More recently, elderly populations have experienced lower mortality and substantial gains in life expectancy. For example, in 2004, U.S. life expectancy at age 65 reached 20.0 years for women and 17.1 years for men (Miniño et al. 2007). These figures have improved considerably from the 65-year-old life expectancy figures of 15.0 years for women and 12.7 years for men in 1950 (Arias 2006).

R. A. Hummer (✉)
Chairperson and Professor of Sociology
Research Associate, Population Research Center
University of Texas at Austin
G1800 Austin, TX 78712
E-mail: rhummer@prc.utexas.edu

This chapter focuses on mortality patterns among individuals aged 65 and above. We draw primarily from literature and data from the United States, with limited international comparisons. Our chapter includes five sections. First, we provide a brief overview of major themes and debates in this area of study. Second, we describe key data sets and methods that are used to study older adult mortality patterns. Third, we present current older adult mortality patterns in the United States by age, sex and cause of death, with limited comparisons made to data drawn from previous periods and from other countries. Fourth, we provide an overview of racial/ethnic and educational differences in older adult mortality in the United States. Finally, we conclude with a summary of the most important patterns, discuss limitations of current data sets and methods and suggest topics for continuing research in this important and exciting area of study.

Current Research Themes and Debates

This section provides a brief overview of three themes in the current older adult mortality literature. The first theme revolves around the debate of whether or not there are limits to human life expectancy and, if so, whether some countries are approaching such a limit. The second theme regards recent research that links childhood conditions and exposures to older adult morbidity and mortality patterns. The third theme involves the accurate measurement of, and trends in, racial/ethnic and socioeconomic differentials in late life mortality. This is not an exhaustive summary of current themes of research in the area but a selective

one based on our perceptions of the most important, exciting and contested issues in current old age mortality research.

The first and perhaps the most hotly debated at the current time, is whether it is possible to see future life expectancy at birth figures rise above a certain plateau, such as age 85. On one side of the debate, researchers have argued that human life expectancy may be biologically capped and thus human life expectancy has an inherent limit. These researchers believe future improvements at the oldest ages will be largely characterized by reduced rates of morbidity but not mortality. Such a pattern would result in a compression of morbidity into a small window of time around the age of 85 without further mortality improvements (Fries 1980). More recently, proponents of what is now termed this “realistic view” of future mortality and life expectancy patterns argue that human life expectancies are not likely to exceed 85 years anytime in the near future unless significant advances are made in slowing down the rate of aging among a significant share of specific populations (Carnes and Olshansky 2007; Olshansky et al. 2001).

Alternatively, a more optimistic perspective contends that both the human life span (Jeune and Vaupel 1999; Wilmoth 1997; Wilmoth et al. 2000) and population-based life expectancy figures (Bongaarts 2007; Wilmoth 1997) have continued to increase quite impressively over time and that neither has an inherent ceiling. Indeed, solid evidence exists that exponential human mortality rate increases by age begin to decelerate after around age 80 and may even peak around age 110 and remain steady or decline thereafter (Vaupel 1997). This optimistic position posits that the leveling off of life expectancy in a few countries around the world appears to be a characteristic of just those few places and, instead, points to the fact that there is an increasing record expectation of life in many other places around the world (Oeppen and Vaupel 2002). Moreover, there has been a well-documented steady, nearly linear, increase in life expectancy figures in many high income countries since 1950, with the potential for further substantial improvements in biotechnology, drug treatments, early life health behavior (e.g., cigarette smoking, exercise, caloric intake) and preventive medicine that is projected to lead to a continuation of such trends (Bongaarts 2007; Ford et al. 2007). Regardless of one’s stance in this debate, any future gains in human life expectancy in high income

countries are likely to be made at the older ages because there is relatively little room for further improvement at younger ages. And at this point in time, the weight of the scientific evidence strongly suggests continuing and perhaps substantial, further gains in human life expectancy, at least among high income countries, given trends over the last half-century and the considerable potential for further behavioral, scientific and medical improvements that impact such populations (Bongaarts 2007; Fogel and Costa 1997; Wilmoth 2001).

A second important developing body of literature has begun analyzing linkages between early life conditions and mortality patterns at older ages (Elo and Preston 1992). Childhood conditions such as poverty or relative affluence, living arrangements, parental education and work status, rural or urban upbringing and the degree of exposure to childhood diseases have been linked with older adult mortality risks decades after such conditions were measured (Crimmins and Finch 2006; Hayward and Gorman 2004; Preston et al. 1998). Other scholars working in this tradition have emphasized linkages between the prenatal environment and health and mortality patterns in middle and late life (Barker 1998). Such associations between prenatal and childhood factors and older adult mortality strongly suggest that mortality patterns among older adults are not strictly based on conditions of and choices made in, late life. Although the mediating factors of such early life associations are not yet well understood, particularly given the long-term cohort data needed to investigate such mechanisms, the basic patterns emphasize the importance of a life course approach in the study of older age mortality and mortality patterns across population subgroups (Hayward 2007; Hertzman 2004).

Recent theoretical advances have been proposed to better understand how such early life conditions relate to older adult mortality patterns. The intriguing recent conceptual model of Crimmins and Finch (2006), for example, argued that early life reductions in infections and inflammations among more recent birth cohorts of individuals – largely due to improvements in social and economic conditions experienced by human populations over the last 200 or so years – have effectively delayed the atherosclerotic process, reduced other organ damage experienced by these recent cohorts and delayed and reduced deaths due to diseases of the heart over this time. Moreover, such decreases in infections and inflammation have also

contributed to increases in population height across cohorts. Coinciding with such changes – and recognized in the Crimmins–Finch model – have also been significant improvements in nutrition across cohorts (Barker 1998; Fogel and Costa 1997). At the same time, though, Crimmins and Finch presented empirical evidence that old-age mortality reductions, particularly from heart disease, may be seriously influenced by early life reductions in infectious diseases and inflammation over the life course. Such continued theoretical and empirical work, aimed at understanding how life course patterns of behavior and exposure impacts health and mortality patterns well into old age, will undoubtedly continue to be at the core of this research area for years to come.

Finally, between-group mortality differentials by race/ethnicity and education continue to be central themes in older age mortality research. In the United States, for example, one of the two primary goals of the Healthy People 2010 initiative (U.S. Department of Health and Human Services 2000) is to eliminate health disparities. Thus, a great deal of work in the last decade has focused on accurately documenting changes in health and mortality disparities (particularly by race/ethnicity and educational level) over time, on trying to better understand the mechanisms by which such sociodemographic disparities in health and mortality exist and by designing effective interventions to close such disparities (see, e.g., National Research Council 1997, 2004). Unfortunately, while U.S. mortality rates have continued to decline in an impressive fashion and have resulted in continued substantial increases in life expectancy (Arias 2006), old age mortality disparities by race/ethnicity have not shown signs of closure. For example, Hummer et al. (2004) recently showed that, based on data from the mid-1990s, black-white relative disparities in old age U.S. mortality were unchanged compared to those estimated by Elo and Preston (1997) using data from the mid-1980s.

On the technical side, there remains a debate about whether a black-white mortality crossover occurs among the oldest-old in the United States and, if it is indeed real, why it exists (Nam 1995). Such a mortality crossover occurs when one subpopulation, in this case U.S. white adults, enjoys a lower mortality rate for most of the life course compared to another subpopulation which, in this case, is U.S. black adults. At some advanced age, however, the mortality rates crossover and, in this case, results in lower black com-

pared to white mortality at the oldest ages. While one set of researchers has documented such a mortality crossover and has concluded that it appears to be real (Corti et al. 1999; Johnson 2000; Kestenbaum 1992; Lynch et al. 2003; Manton et al. 1979; Manton and Stallard 1997; Nam et al. 1978; Parnell and Owens 1999), others have been skeptical due to concerns over data quality issues and, in particular, differential age misreporting by race among older adults (Coale and Kisker 1986, 1990; Preston et al. 1996, 1999). Recent evidence produced by a research team from the latter perspective found a U.S. racial mortality crossover occurring at ages 90–94 for females and 95 and over for males (Hill et al. 2000). This work identified the crossover to occur at an older age than most other researchers have found but nevertheless continues to suggest that a black-white crossover exists.

In contrast to the great deal of work that has examined older adult black and white U.S. mortality patterns, few researchers have investigated data quality issues or corrected for age misreports among other U.S. racial/ethnic minority groups. Excellent exceptions include Lauderdale and Kestenbaum's (2002) examination of Asian American older adult mortality patterns and Elo et al.'s (2004) examination of Hispanic older adult mortality patterns. Given the substantial growth of the Hispanic and Asian American subpopulations in the United States in recent decades, combined with the aging of these populations, this is an area of research that is primed for development in the coming decade.

A host of researchers has also shown that educational disparities in mortality are narrower at older adult than at younger adult ages (for examples, see Kitagawa and Hauser 1973; Rogers et al. 2000). But there is considerable debate as to whether this narrowing exists among recent cohorts of U.S. adults, particularly when mortality selection is taken into account (Crimmins 2005). Indeed, the cumulative advantage hypothesis posits that, unlike the effects of other factors that may fade with increasing age, the benefits of education for health and mortality accumulate with age (Lynch 2003; Ross and Wu 1995). Ross and Wu (1995, 1996) argued that there are greater educational differences in health at older than at younger ages due to cumulative effects of lifetime educational benefits: steady employment, greater savings and investments and better long-term health behavior among the more educated. Alternatively, the age-as-leveler hypothesis suggests that a more level playing field

exists for health and mortality at older ages. That is, there may be a decreased educational mortality gap at older ages because of the influence of age itself, which may work to reduce the influences of life course social and behavioral advantages and disadvantages and result in a more biologically-based pattern of mortality at the oldest ages (Beckett 2000).

Most studies to date using cross-sectional data document differences in education and mortality that are larger at the young and middle adult ages and smaller at older ages (see Beckett 2000; Feldman et al. 1989; House et al. 1990; Kitagawa and Hauser 1973; Molla et al. 2004; Preston and Taubman 1994; Smith 2005; Sorlie et al. 1995). There have been a number of proposed explanations for such a difference, with mortality selection frequently mentioned. That is, those who are less educated and less healthy at the younger ages die earlier, leading to the appearance that educational differences in mortality close at older ages (Crimmins 2005). But at least one recent prominent study (Beckett 2000) failed to find evidence that mortality selection was responsible for a narrower educational mortality differential among the elderly. Others, however, strongly suggest that the effects of education on health increase with age. Lynch (2003) recently found that the effect of education on health strengthens with increasing age and that this pattern has intensified across cohorts (see also Ross and Wu 1995, 1996). Further, Lauderdale (2001), in a novel analysis of U.S. Census data, found that compared to earlier cohorts, more recent cohorts are characterized by wider educational mortality disparities than those from the earlier portion of the 20th century. Thus, further research is clearly warranted to resolve the debate regarding whether the education/mortality gap closes or widens with increasing age and among more recent birth cohorts.

Data and Methods

Common Data Sources

Numerous data sources are used to study older adult mortality. Because space is limited, the following subsections briefly summarize data sources that are widely used, national in scope and likely to be updated

in the future. In addition, many other data sources are available for analysis (see e.g., Data Sources on Older Americans at www.agingstats.gov).

Official U.S. mortality data – which are used to compare mortality rates across ages, sexes, racial/ethnic groups, educational levels, geographic areas, causes of death and more – are derived from two sources: death certificates and census data. Census data, which comprise the denominator data for the official U.S. mortality rates, are collected decennially. Between-census population estimates are used as denominator data until new census figures are collected. Death counts, which are the numerator for official mortality rates, come from death certificates, which are first filed with state vital statistics agencies and then submitted to the National Center for Health Statistics (NCHS). Taken together, these data permit the estimation of a wide variety of mortality rates over a given time period, including age-, sex-, cause- and geographic-specific mortality rates. Further, given substantial consistency in these data sources over time, they also allow for careful trend analyses.

Incredible advances in computing technology and increased capacity to digitally store and share such data over the last 25 years have resulted in a wealth of United States vital-statistics based mortality information being accessible online (see www.cdc.gov/nchs). Similarly, there are comparable mortality data available on the internet for many countries throughout the world and for various time periods. The Human Mortality Database (www.mortality.org), in particular, provides excellent documentation of the longevity revolution of the twentieth century for more than two dozen countries. Most of the countries included are relatively wealthy, since the database is limited to countries where mortality recording is virtually complete. For most of these countries, the data accessible online is nearly exhaustive and in many cases already tabulated; indeed, this data base includes yearly counts of deaths, population at risk denominators, rates of death and life tables for the various countries. While mortality data collection for many countries began in the mid-twentieth century, there are high-quality data sets for many western European countries that reach back to the nineteenth and even eighteenth centuries (e.g., Sweden's collection begins in 1751).

Providing accurate mortality experiences for the population of over 50 countries, the Human Life-

Table Database (HLD, www.lifetable.de) is another very important source of international mortality data. Most of the HLD life tables are calculated for national populations, which, like the U.S. vital statistics based estimates, have been officially published by national statistical agencies. These publicly accessible data make basic mortality comparisons by age, time and country available to many users and are an invaluable source for comparative research. Similarly, the World Health Organization's (WHO) library database is a large source of international descriptive data on multiple indicators of older adult health and mortality. The library indexes all WHO publications from 1948 onwards and has also compiled regional health databases to complement other sources.

In addition to counts of deaths and population-at-risk estimates from censuses and vital registration systems, a great deal of mortality data is now produced through nationally representative surveys that are linked to follow-up mortality information for the individuals who were included in the survey. Such sample surveys take a variety of forms but nearly all offer more detailed and complex data than census and vital registration data. In the United States, there are numerous recent surveys aimed at documenting patterns and trends of older adult mortality, morbidity and disability. The National Health Interview Survey (NHIS), an annual health interview of a nationally representative sample of non-institutionalized individuals that is conducted by NCHS (see <http://www.cdc.gov/nchs/nhis.htm>), is the primary source of information on the health of individuals in the U.S. NHIS includes information on a wealth of variables, including age, sex, race, ethnicity, nativity, income, education, smoking, self-reported health, activities of daily living and more for approximately 100,000 people (encompassing close to 40,000 households yearly). Furthermore, NHIS is linked to the National Death Index (LMF) to create the National Health Interview Survey – Longitudinal Mortality Follow-up (NHIS-LMF), which is especially well suited for the study of old age mortality patterns within the U.S. population (NCHS 2007). Overall, the NHIS-LMF enables researchers to examine mortality patterns across a range of sociodemographic, behavioral and health factors with a very large prospective data set. Indeed, the most recent public-use version of this data set encompasses 15 years of baseline NHIS data (from 1986–2000), with death linkages through 2002 (NCHS 2007).

There are some important advantages and disadvantages in using survey-based data sets linked to follow-up death records to analyze older adult mortality trends and patterns. Advantages include the fact that the baseline survey information, such as educational level and smoking behavior, is provided by either the individual or a co-resident of the individual. Second, such survey-based data sets provide a large array of measures collected at the time of the survey (e.g., Rogers et al. 2000). These are enormous advantages over the more limited vital statistics based data sets.

There are, however, a few important limitations of such survey-based mortality data sets. For example, some of the surveys cap the reporting of the oldest ages at 99 years and above and sometimes as low as 85 years and above. These age caps eliminate age variation for the oldest old populations, limiting or prohibiting researchers from analyzing patterns of health and mortality at the very oldest ages. Such survey-based data sets also do not cover the complete population: they are samples of the U.S. population and most often exclude the institutionalized population (i.e., persons in nursing homes, long-term care institutions and prisons) by design. The linked data sets are also thought to miss around two per cent of decedents during the mortality follow-up period (NCHS 2007). This may in particular influence the findings for racial/ethnic groups that have high percentages of immigrants. Indeed, linkage quality from deaths to the surveyed individuals has been shown to be lower among heavily immigrant populations (Hummer et al. 2000; Liao et al. 1998). Third, again for some racial/ethnic groups composed of a large percentage of immigrants, return migration to the country of origin among individuals originally included in the survey may also serve to bias estimates of mortality downward (Palloni and Arias 2004). Finally, sample size for the oldest-old population in survey data sets tend to be relatively small, thus providing unstable estimates at the oldest ages and making detailed cause-specific analyses impossible.

Several surveys specific to older populations have also been used in recent old age mortality research. Often, these studies use longitudinal designs with a focus on life-course trends. Perhaps most important, these include the Health and Retirement Study (<http://hrsonline.isr.umich.edu>), the National Long-term Care Study (<http://www.nlts.aas.duke.edu/index.htm>) and the Longitudinal Study on Aging (

cdc.gov/nchs/isoa.htm). Also, the National Longitudinal Mortality Study (NLMS) is a Current Population Survey based study, with links to follow-up mortality information from the NDI, which has been specifically used for understanding sociodemographic differentials in U.S. adult mortality (<http://www.census.gov/nlms>).

Common Measures and Methods

Researchers use a number of techniques to document and understand older adult mortality patterns and trends. The questions demographers ask and the data available to them greatly influence the methods used. For example, actuarial accounting of mortality by church parishes and insurance companies date back centuries (Newell 1988). These historical data permitted calculations of crude death rates, which simply reveal the number of deaths in a given time period relative to estimated person-years lived in that given time period. While easily computed and understood, the crude death rate is a poor measure of mortality because it fails to account for the varying age structures of populations. Due to the limitations of the crude death rate, analysts often calculate age-standardized or age-specific mortality rates to make comparisons across populations, geographic areas and time periods (Preston et al. 2001). While age-specific rates have the same structure as the crude death rate, the age range for which the deaths and person-years used is restricted to single years or five-year groupings, thus making for estimates that are very sensitive to the age structure of the population. Age-standardized rates, on the other hand, compare overall mortality rates across populations by applying the age structure of either one real or hypothetical population (i.e., a “standard” population) to the other populations, thereby controlling for the effects of differential age structures across populations.

Life expectancy and life span are also important measures used in older age mortality analyses. Life span refers to the maximum number of years a human can live, while life expectancy is a far more complex estimate of longevity. To illustrate, the life span of humans is simply the longest recorded life ever lived. The current life span is therefore just over 122 years, based on the life of Jeanne Louise Calment, of Arles, France, who died in 1997 (Robine

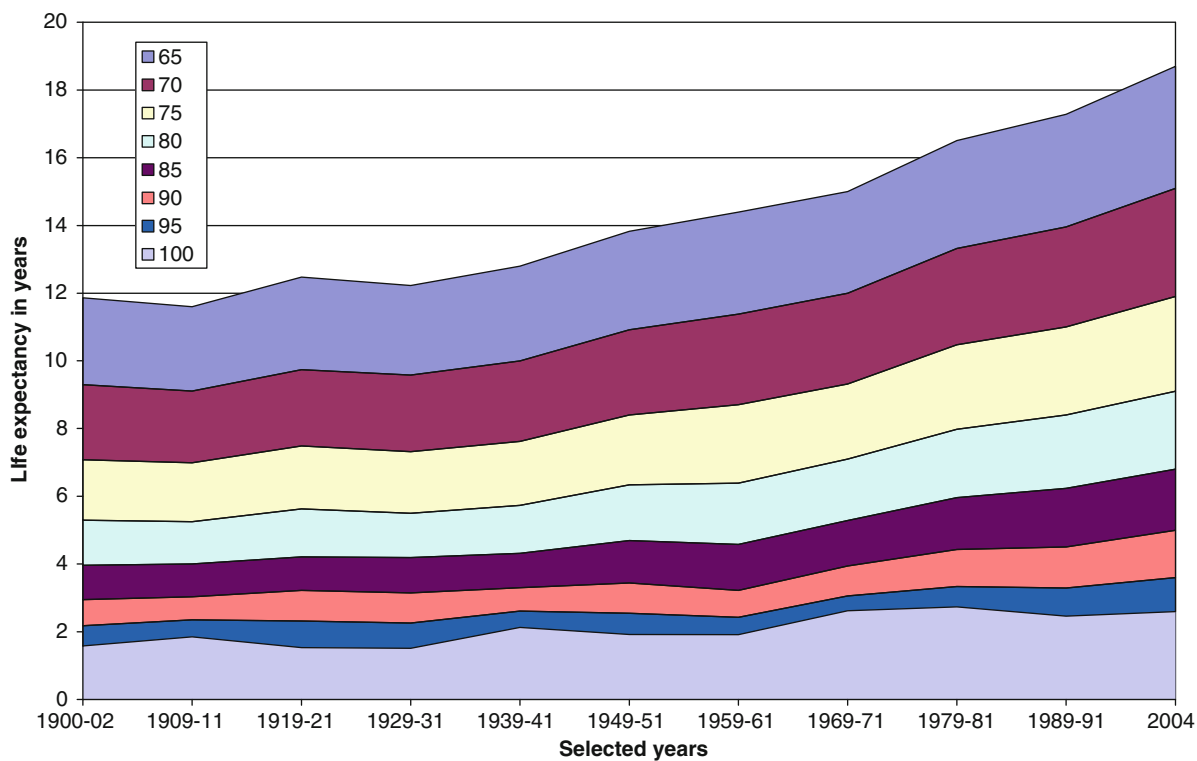
and Allard 1999). This life span could be increased if a single individual outlived Madame Calment. Life expectancy, in contrast, is a measure of the average number of additional years a group of individuals could expect to live beyond their current age given the current mortality schedule of their population (Preston et al. 2001). Life expectancy figures are calculated by using life tables (see e.g., Kintner 2004; Preston et al. 2001). Indeed, life tables have been used in mortality research for several centuries and continue to be widely used in present day analyses. In fact, the life table is one of the most fundamental demographic tools because in addition to providing life expectancies at a given age, life tables also provide information on a population’s survivorship and mortality probabilities by age. Using age-specific death rates of a given time period as inputs, the life table conveniently expresses a population’s mortality schedule.

Most often, mortality-based life tables are constructed to examine single decrements (e.g., survival versus death) but they can also accommodate analyses of multiple decrements (e.g., competing causes of death) and cause-elimination (Preston et al. 2001). Cause-elimination life tables provide the hypothetical gain in life expectancy based on the assumption that a specific cause of death is eliminated. Such scenarios provide additional insight into the impact of specific causes of death on overall mortality and on future potential gains in life expectancy. For example, based on cause-elimination life tables, life expectancy at birth in the United States in 1989–91 could increase by 3.4 years if cancer was eliminated, 6.7 years if major cardiovascular diseases were eliminated but only 0.4 years if infectious and parasitic diseases were eliminated (Anderson 1999). Beyond their pragmatic utility, life tables are popular instruments of analysis because they reveal differences that warrant further explanation. Furthermore, life tables have led to the development of more advanced analytical tools. Indeed, hazard models (Cox 1972), an extension of the life table, have enjoyed extensive use among researchers investigating variations in adult mortality for the last three decades. The Cox proportional hazard model, for example, is probably the most frequently utilized type of model in older adult mortality research and allows for the multivariate modeling of mortality risk over time (Alison 1984).

Likewise, increment-decrement (also called multi-state) life tables have been increasingly used to analyze population health, or “healthy life expectancy” (Hayward and Warner 2005; Hayward and Heron 1999). Specifically, linkages between mortality, morbidity and disability have been modeled to conceptualize new measures of population health that explicitly integrate mortality, disability and the institutionalization experiences of populations. These techniques have demonstrated that over time elderly individuals in the United States are enjoying both longer lives and better health (Rogers et al. 1990). Expanding the basic life table approach allows descriptive comparisons of population health while standardizing age composition, as well as addressing the question of whether declining mortality results in the prolongation or reduction of life with disability and morbidity. The Disability Adjusted Life Expectancy (DALE) measure, for example, was developed by researchers at the World Health Organization (WHO) to summarize the expected number of years to be lived in “full health” (WHO 2000).

Age, Sex and Cause-Specific Patterns of Older Adult Mortality

Over the last century, the United States has experienced dramatic relative and absolute increases in life expectancies in virtually all age categories, including those aged 65 and above (see Fig. 23.1). Between the periods 1900–1902 and 2004, life expectancies increased from an estimated 1.6–2.6 years among centenarians, 4.0–6.8 years among 85 year olds and 11.9–18.7 years among 65 year olds. Thus, each age group experienced at least a 50 per cent increase in life expectancy. These increased life expectancies are due to more knowledge about health behaviors and improved medical technology, health care, personal hygiene, public health interventions, housing, nutrition and socioeconomic status (NCHS 2003). Indeed, the percentage of the population aged 65 and above who had graduated from high school was just 17 in 1950 but 72 in 2003 (Federal Interagency Forum on Aging Related Statistics [FIFOARS] 2004). And the



Source: Derived from Arias 2006, and Miniño et al. 2007.

Fig. 23.1 Life expectancies by age, selected years, U.S.

percentage of the population aged 65 and above living below the poverty threshold was 35.2 in 1959 but just 10.4 in 2002 (FIFOARS 2004).

Table 23.1 highlights important trends in age-specific contributions to life expectancy at birth over time in the United States. Whereas gains in life expectancy at birth resulted largely from mortality reductions at younger ages in the early part of the century, the most recent time periods show that gains have largely resulted from mortality reductions among older ages. For example, Panel A, column 1 indicates that male life expectancy at birth increased 7.6 years between 1900 and 1920. Over 64 per cent of this gain was attributable to mortality reductions at ages 4 and younger, while just 0.2 per cent of the gain resulted from mortality reductions among those aged 85 and above. Between 1920 and 1940, the gain in life expectancy due to mortality reductions among persons aged 4 and younger, while still substantial, was not as large as the contribution in the previous period; moreover, there were some negative influences on life expectancy at birth among middle-aged and older males (see the negative signs in age groups 45–64 and 65–84, which were due to age-specific increases in male mortality between 1920 and 1940). Between 1980 and 2003, over 70 per cent of all gains in life expectancy at birth among U.S. males

were due to mortality reductions occurring at ages 45 and above and almost 40 per cent were due to mortality reductions at age 65 and above.

Females exhibited similar patterns in percentage contributions, with early gains in life expectancy due to mortality reductions at younger ages and more recent gains brought about largely by mortality reductions at older ages. Moreover, females, compared to males, show greater percentage contributions in life expectancy at birth gains due to recent mortality reductions at the oldest ages. Females have experienced a consistently greater proportion of life expectancy gain at ages 65 and above than males in all time periods following 1920. Indeed, almost 10 per cent of the female gains in life expectancy at birth were due to mortality reductions among persons ages 85 and above during the periods 1960–1980 and 1980–2003.

These patterns shown in Table 23.1 highlight that: (1) future gains in U.S. life expectancy are likely to be the result of continued mortality decreases at older rather than younger ages, (2) future life expectancy gains can be expected even among the oldest ages (particularly among those aged 85 and older) and (3) further gains in life expectancy due to mortality reductions at younger ages, where mortality is already very low, will be modest.

Table 23.1 Age-specific percentage contributions to gains in life expectancy at birth, by sex and over selected periods, U.S.

Ages	Selected period				
	1900–1920	1920–1940	1940–1960	1960–1980	1980–2003
Panel A. Males					
0	41.9 %	31.9 %	30.8 %	32.5 %	9.8 %
1–4	22.3	22.3	9.1	3.5	2.2
5–24	9.4	27.0	13.6	1.6	7.6
25–44	12.7	22.6	21.7	4.7	8.9
45–64	10.0	–2.7	15.4	33.2	31.6
65–84	3.4	–1.1	9.0	21.6	36.8
85+	0.2	0.0	0.5	2.9	3.0
Gain in \dot{e}_0 in years	7.6	6.1	5.2	3.3	4.6
Panel B. Females					
0	42.4 %	19.9 %	19.1 %	20.3 %	16.9 %
1–4	25.2	16.0	6.3	2.7	3.1
5–24	10.3	24.3	12.8	2.7	4.3
25–44	9.9	24.7	19.4	8.6	6.2
45–64	8.9	9.9	22.5	18.3	25.3
65–84	3.1	5.0	19.4	37.7	34.4
85+	0.2	0.2	0.5	9.6	9.8
Gain in \dot{e}_0 in years	6.7	8.5	7.3	4.4	2.4

Notes: See Preston et al. (2001: 64–65) for age decomposition calculations.

Source: Derived from Arias 2006.

The U.S. is now enjoying its highest life expectancy at birth ever achieved but it still trails at least 20 other countries in this measure. Compared to the 2003 U.S. life expectancy at birth of 77 years, for example, Germany, Spain and Norway have life expectancies over 78 years. Furthermore, Canada has a life expectancy at birth of 79 years, while Sweden and Japan each enjoy life expectancies over 80 years. U.S. life expectancy at birth is lower than many other industrialized countries because of relatively high infant mortality, higher rates of smoking across the life course, lack of universal health care and high levels of social and racial/ethnic inequalities.

Although life expectancies are most often reported at birth, they can be calculated for any age. U.S. elderly life expectancies have improved over time and for both sexes and compare favorably with other countries, although they are by no means the highest in the world. The life expectancy for 65 year olds in the U.S. in 2003 was 16.8 years for males and 19.8 years for females. Many countries – including Austria, Australia, Canada, France, Hong Kong, Iceland, Israel, Italy, Japan, New Zealand, Norway, Sweden and Switzerland – enjoy higher elderly life expectancies. Currently, Japan has the highest elderly life expectancy in the world; at age 65, Japanese men can expect to live 18.2 additional years and Japanese women can expect to live 23.3 additional years. Thus, elderly Japanese men can expect to live

1.4 years longer than elderly American men and elderly Japanese women can expect to live 3.5 years longer than elderly American women. But this gap closes at the oldest ages (85+). For example, life expectancy at age 85 is 6.0 years for U.S. men and 6.1 years for Japanese men and 7.2 years for U.S. women and 8.1 years for Japanese women (United Nations 2004; NCHS 2003). The higher overall elderly life expectancies in many countries throughout the world suggest that U.S. life expectancies still have much room to improve.

Age- and Sex-Specific Mortality Patterns

The age pattern of human mortality consistently follows a “J” pattern, with somewhat higher rates in infancy, the lowest mortality generally occurring at ages 10 and 11, increasing mortality with the “accident peak” in the late teen and early adult years and followed by increasing mortality from the mid-20s through the oldest ages (see Fig. 23.2). To provide more detail at all ages, the mortality rates in Fig. 23.2 are based on U.S. data from three aggregated years (1989–1991) that provide more stable estimates and that present mortality rates through age 109. Further, for ages 95 and above, mortality rates are calculated based on Medicare data,

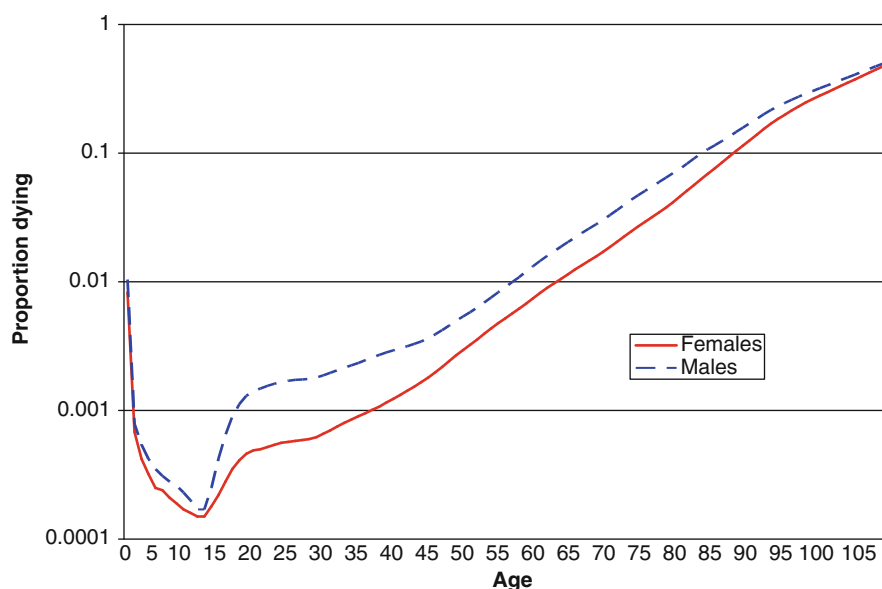


Fig. 23.2 Age-specific mortality rates by sex, U.S., 1989–1991

Note: logged scale.
Source: derived from Armstrong 1997.

which, for older age adults, are considered more accurate than rates based on official census and vital statistics data (Armstrong 1997). The rates are presented on a logged scale. At every age, U.S. males experience higher mortality risk than females. This higher male risk is most apparent during the accident peak during the adolescent and young-adult years. After the mid-20s, there is a slow but steady convergence in male and female mortality rates throughout the remainder of the life span, although the rates never do fully converge.

While death rates tend to increase exponentially through most of the adult ages, the rate of mortality increase begins to slow at the oldest ages, which is called mortality deceleration (Horiuchi and Coale 1990; Horiuchi and Wilmoth 1998; Keyfitz 1985; Lee and Carter 1992; Lynch et al. 2003; Manton 1992). Based on the logged scale, continued exponential increases in mortality would produce linearly increasing mortality at the oldest ages. Instead, mortality risk increases at the oldest ages begin to attenuate, even though mortality at each subsequent age is higher than the earlier ages. Mortality risk at the very oldest single ages, those above 100, is around 50 per cent per year.

Two primary hypotheses have been suggested to explain this mortality deceleration: the individual risk and the heterogeneity hypotheses (Khazaeli et al. 1995). The heterogeneity hypothesis posits that compared to the set of individuals who died in earlier ages, the population of individuals who survive to older ages are more robust (or less frail). Thus, the population of individuals who are at risk of dying is different (more robust) at the

older ages than at the younger ages and this change in population composition may, in fact, help to influence very old age mortality deceleration (Manton et al. 1994; Vaupel et al. 1979). Alternatively, the individual-risk hypothesis suggests that the deceleration of mortality risk occurs because of distinct physiological (e.g., metabolic rates, cell proliferation) or evolutionary (e.g., cell senescence) processes that slow mortality risks at older ages (Carnes and Olshansky 1993; Finch 1990; Grove and Kligman 1983; Mueller and Rose 1996).

Sex Differences in Life Expectancy

Men and women differ with respect to both life expectancies and the pace of life expectancy gains over time. Both sexes in the U.S. experienced substantial increases in life expectancy over the last fifty years (Table 23.2). Between 1949–1951 and 2003, life expectancy at age 65 increased from 15.0 to 19.8 years for females and from 12.7 to 16.8 years for males. Note, however, that the sex gap in life expectancy changes over time. The sex gap in life expectancy at age 65 was smallest in 1949–1951 at just 2.2 years, gradually widened to 4.2 years in 1979–1981 and then slowly closed to 3.0 years in 2003 (Table 23.2, Panel C). Thus, for over two decades, the sex gap in life expectancy at age 65 has been narrowing because, compared to females, males have experienced larger life expectancy gains, especially the

Age	Year					
	1949–51	1959–61	1969–71	1979–81	1989–91	2003
A. Female						
65	15.0	15.8	16.8	18.4	19.0	19.8
75	8.9	9.3	10.3	11.6	12.1	12.6
85	4.9	4.7	5.6	6.4	6.7	7.2
95	2.6	2.4	3.2	3.5	3.4	3.7
B. Male						
65	12.7	13.0	13.0	14.2	15.1	16.8
75	7.8	8.0	8.1	8.9	9.4	10.5
85	4.4	4.4	4.7	5.1	5.3	6.0
95	2.5	2.4	2.8	3.0	2.9	3.2
C. Differences (Female-Male)						
65	2.2	2.9	3.8	4.2	3.9	3.0
75	1.1	1.3	2.1	2.7	2.7	2.1
85	0.5	0.3	0.9	1.3	1.4	1.2
95	0.1	0.0	0.4	0.5	0.5	0.5

Table 23.2 Life expectancies by age and sex, selected years, U.S.

Source: Derived from Arias 2006.

periods between 1980 and 1990 and 1990 and 2003 (Preston and Wang 2006). Over the last 20 years, the sex gap in life expectancy has exhibited a similar but less distinct narrowing at age 75, a more variable pattern at age 85 and stability at age 95.

Sex differences in mortality are difficult to explain. Sociological explanations of the male-female mortality gap often note that supportive and mutually beneficial social relationships, generally benefiting women more than men, buffer against the risk of death. Indeed, compared to men, women are more likely to engage in beneficial social relationships and participate in health promoting social activities. Marriage is associated with lower mortality and increased longevity for both men and women (Waite and Gallagher 2000). But because men often marry younger women, men may derive a longevity benefit from the increased time they spend married (Rogers 1995). Although most social interactions are helpful in reducing the risk of death, caregiver roles can also produce fatigue, stress, illness and a greater risk of death (Schulz and Beach 1999) and women are more likely than men to care for children, spouses and parents (Mohai 1997).

Socioeconomic status also plays a role in the sex gap in mortality at all ages but the mechanisms vary in importance over the life course (Williams 1990). Generally, men benefit from higher incomes and have had higher levels of education compared to women, although this is clearly changing in the United States (Everett et al. 2007). However, men with low levels of education and income may also suffer from a higher relative risk of death compared to similarly disadvantaged women (Rogers et al. 2000). The socio-structural hypothesis asserts that males and females engage in differential health behaviors depending in part upon their educational, occupational and marital statuses. For instance, males with high levels of education engage in much healthier behaviors than males with low levels of education due to their greater exposure to health-related ideas, the social networks that they are embedded in and the greater access they have to health promoting resources (Nathanson and Lopez 1987). Consistent with this idea, Rogers et al. (2000) revealed that the smallest sex gaps in mortality characterized the most structurally advantaged groups in U.S. society, which is, those who were highly educated, married, with high incomes and currently employed.

Historically, compared to women, men have also experienced higher mortality because they are more

likely to partake in risky behaviors such as smoking, excessive drinking, working in hazardous occupations, fighting, risky driving and illicit drug use (Rogers et al. 2000). And some of the conditions that continue to account for sex mortality differences among older people reflect behaviors and experiences from earlier in the life course.

Over the last several decades, change in the male-female pattern of cigarette smoking has been the predominant force in closing the male-female mortality gap (Pampel 2002; Preston and Wang 2006). Both the percentage of current smokers and the gap between males and females has been declining over time. For instance, smoking prevalence reached a high point in 1965 when 33.9 per cent of U.S. adult females and 51.9 per cent of U.S. males were reported to be current smokers (NCHS 2006). Drastic declines in male smoking, along with modest declines in female smoking, have reduced this large smoking prevalence sex gap among all adults to a 4.3 percentage point difference and a 2.1 percentage difference among men and women aged 65 and older in 2004 (NCHS 2006).

Future gains in older age mortality should occur because of further reductions in smoking, with greater gains expected for men. For instance, Preston and Wang (2006) examined death rates for different U.S. birth cohorts and found that changes in smoking patterns over time have accounted for a large reduction in the sex difference in mortality. Using synthetic cohorts, they show that current smoking patterns may lead to a 23 per cent increased survival from ages 50 to 85 for men and a 2 per cent gain for women, thereby substantially reducing the mortality sex gap. Additionally, potential gains associated with changing smoking patterns particularly benefit those at older ages (Rogers et al. 2005).

Biological factors also account for part of the sex gap in life expectancy. Compared to men, women may experience lower risks of death from heart disease, some cancers and infectious diseases because of hormones, X-linked genes and reproductive physiology (Gage 1994; Waldron 1983). For example, Horuchi (1997) claimed that heart disease mortality is lower among younger women than men in part because of high levels of estrogen and it increases as estrogen levels decline. Further, declining levels of estrogen at older ages could partly explain the narrowing of the sex gap in mortality at older ages. As such, estrogen replacement therapy is provided in part to reduce the risk of heart disease (Grodstein et al. 1997).

Cause-Specific Older Adult Mortality Patterns

Epidemiologic transition theory asserts that, largely because of overall improvements in standards of living, causes of death have shifted from infectious and parasitic diseases in previous periods to chronic and degenerative diseases in modern times (Omran 1971, 1977). Olshansky and Ault (1986) further noted that this transition has more recently led to the “age of

delayed degenerative death,” in which cause of death patterns remain similar to previous years but mortality has now concentrated at older ages due to declining death rates at younger adult ages. Accordingly, we now find high rates of death due to chronic and degenerative diseases among the elderly in high income countries such as the United States.

Table 23.3 presents death rates for major causes of death in the U.S. among males (Panel A) and females (Panel B) aged 65 and older, for selected years. The leading causes of death are major cardiovascular dis-

Table 23.3 Death rates for leading causes of death by sex, selected years, ages 65 and over, U.S.

Causes of death	Year					Percentage change 1985–2003
	1985	1990	1995	2000	2003	
A. Male						
Major cardiovascular diseases	3841.7	3265.8	2999.2	2632.3	2344.7	–39.0
– Diseases of heart	3055.2	2594.7	2361.0	2037.1	1820.4	–40.4
– Cerebrovascular diseases	550.4	466.0	451.2	427.7	371.5	–32.5
Malignant neoplasm	1530.9	1589.9	1567.4	1471.3	1384.5	–9.6
– of trachea, bronchus and lung	461.3	487.8	479.3	448.1	425.7	–7.7
– of breast	1.8	1.4	2.0	2.0	1.7	–5.6
Chronic lower respiratory diseases	386.5	380.9	383.0	391.0	367.2	–5.0
Influenza and pneumonia	330.4	335.8	304.4	203.2	183.6	–44.4
– influenza	8.3	7.8	1.7	4.6	3.9	–53.0
– pneumonia	322.1	328.0	302.7	198.6	179.6	–44.2
Alzheimer’s disease	36.2	50.4	63.9	117.7	137.3	279.3
Diabetes mellitus	103.3	124.5	145.1	163.8	169.7	64.3
Accidents	125.1	114.9	115.5	116.4	121.2	–3.1
All causes	7314.2	6782.6	6522.3	6125.2	5742.7	–21.5
B. Female						
Major cardiovascular diseases	2713.4	2340.3	2202.9	2009.7	1816.8	–33.0
– Diseases of heart	2041.2	1773.7	1646.3	1464.2	1319.5	–35.4
– Cerebrovascular diseases	513.7	432.4	424.9	414.7	368.7	–28.2
Malignant neoplasm	827.1	875.4	903.0	898.4	870.5	5.2
– of trachea, bronchus and lung	133.1	176.3	210.7	228.1	233.2	75.2
– of breast	126.6	133.6	128.0	116.8	110.3	–12.9
Chronic lower respiratory diseases	133.2	168.6	208.8	253.4	258.2	93.8
Influenza and pneumonia	196.5	217.0	201.1	147.1	137.3	–30.1
– Influenza	7.8	6.7	1.6	4.3	3.8	–51.3
– pneumonia	188.7	210.3	199.5	142.8	133.5	–29.3
Alzheimer’s disease	27.9	47.5	64.8	150.1	182.7	554.8
Diabetes mellitus	103.1	117.6	130.2	140.2	137.4	33.3
Accidents	68.4	66.0	66.4	71.7	75.5	10.4
All causes	4713.0	4488.1	4489.6	4495.0	4336.9	–8.0

Notes: Age-adjusted death rates per 100,000.

Source: NCHS trends in Aging and Health Website (<http://www.cdc.gov/nchs/agingact.htm>).

eases, including diseases of the heart and cerebrovascular diseases; malignant neoplasms; chronic lower respiratory diseases; and influenza and pneumonia.

Over time, both sexes have experienced impressive declines in specific causes of death, including mortality due to influenza and pneumonia and to heart disease. Between 1985 and 2003, mortality due to heart disease declined by 40.4 per cent among males and by 35.4 per cent among females. The risk of heart disease can be reduced through increased physical activity, eschewing tobacco, maintaining a healthy body weight and maintaining healthy cholesterol levels. High cholesterol levels can be reduced through exercise, loss of excess weight, proper diets and, if lifestyle modifications do not produce desired effects, drug therapy. Statins are one class of drugs that are commonly prescribed to lower cholesterol and reduce coronary heart disease morbidity and mortality risk, in part because they are considered to be safe and effective. Both sexes and individuals of middle and older adult ages are increasingly aware of the need to assess and, if needed, control high cholesterol. For instance, between 1995–1996 and 2001–2002, among individuals aged 65 and above, the percentage of physician office and hospital outpatient department visits that resulted in the prescription or ordering of statin drugs increased from 20.4 to 64.6 (NCHS 2004). It is unclear how much statin drugs have directly reduced heart disease mortality but it is abundantly clear that heart disease mortality has experienced substantial declines in recent times for both men and women.

Technological advances may also be responsible for declines in mortality due to influenza and pneumonia: between 1989 and 2002, the percentage of individuals aged 65 and above who were vaccinated against influenza within the past year and against pneumococcal diseases anytime in their lives increased from 31.0 to 65.8 per cent and from 14.3 to 56.3 per cent, respectively (NCHS 2004). Pneumonia comprises over 97 per cent of all influenza and pneumonia deaths for both males and females. Between 1985 and 2003, mortality rates from pneumonia dropped by 44 per cent among U.S. males and by 29 per cent among females.

Even though there is now better identification, screening, management and treatment of diabetes, diabetes mortality increased for both sexes in recent years, albeit at a slower pace among women. In 1985, the diabetes mellitus mortality rate was 103 per 100,000 for both men and women. But by 2003,

it was 137 for women and 170 for men. The higher male mortality due to diabetes mellitus corresponds to the greater incidences of obesity among elderly men. Among individuals aged 65–74, between the periods 1960–1962 and 1999–2002, the percentage of persons who were obese increased from 23.2 to 39.3 per cent among women and from just 10.4 to 31.9 per cent among men, or an over three-fold increase among men (FIFOARS 2004). Although obesity is just one factor, it plays an important role in diabetes and can explain part of the widening sex difference in diabetes mortality. Diabetes is an important contributor not only to diabetes-specific mortality but also to other causes of death, including diseases of the heart, cerebrovascular diseases and kidney disease (NCHS 2003).

Alzheimer's disease as a cause of death has increased substantially over time for both sexes. The rapid increase in Alzheimer's disease is most likely due to multiple factors, including: (1) an aging population that is more likely to be at risk of Alzheimer's disease; (2) success in reducing the risk of other diseases, which increases the likelihood of Alzheimer's disease deaths; and (3) the greater likelihood of medical doctors to list Alzheimer's disease as an underlying cause of death.

Women have experienced substantial declines in several major causes of death. For example, between 1985 and 2003, breast cancer mortality in the U.S. declined by 12.9 per cent among women. This may be due to a variety of factors, including better screening and earlier intervention. Indeed, the percentage of women who have had a mammogram within the past two years increased from 22.8 per cent in 1987 to 68.0 per cent in the year 2000 (FIFOARS 2004).

Compared to men, women have lower mortality from every major cause of death listed, save breast cancer, which is much more likely among women and Alzheimer's disease, which may be due to women's success at avoiding other causes of death leading to their greater survival to very advanced ages and eventual higher risk of Alzheimer's disease. Nevertheless, compared to women, men have enjoyed more pronounced improvements in every major cause of death listed, except for breast cancer and diabetes mellitus, over the last 18 years. For example, between 1985 and 2003, diseases of the heart declined 40.4 per cent among males and 35.4 per cent among females; malignant neoplasm mortality declined by 9.6 per

cent among males but increased 5.2 per cent among females; and chronic lower respiratory disease mortality declined 5.0 per cent among males but increased 93.8 per cent among females. Divergent patterns of cigarette smoking by sex may be responsible for a large portion of these differing cause-of-death trends (Preston and Wang 2006).

Racial/Ethnic and Educational Patterns of Older Adult Mortality

Racial/ethnic and educational differentials in health and mortality have been the focus of much previous old age mortality research and form a central core of

the U.S. public health agenda. Moreover, the rapidly changing age, racial/ethnic, socioeconomic and health composition of the country warrant new updates and assessments of these differentials.

As discussed above, NCHS constructs official mortality rates for racial, ethnic and educational sub-populations based on death certificates (numerator) and census (denominator) data. This data source is large and covers the entire population, including individuals living in nursing homes, long-term care institutions and prisons. But there are some well-known limitations with the quality of the official death rates by race/ethnicity and education, especially among the elderly (Hummer et al. 2004; Rosenberg et al. 1999). First, there is the issue of differential reporting sources between the two sources. Reporting

Table 23.4 Death rates per 1,000 by race/ethnicity and death rate ratios vis-à-vis non-hispanic whites for the elderly population of the United States, Official U.S. Mortality Data, 1999

Age Group	Non-Hispanic Black	Hispanic Origin	Asian/Pacific Islander	Native American	Non-Hispanic White
Panel A: Death Rates					
Females					
65–69	22.3	11.3	8.6	17.4	15.2
70–74	35.2	16.6	14.0	24.1	23.7
75–79	51.2	25.9	22.7	31.5	38.0
80–84	77.1	43.0	42.6	45.0	64.9
85+	144.7	88.4	84.0	64.0	152.8
Males					
65–69	35.7	18.4	13.6	24.7	24.3
70–74	52.4	27.0	23.9	32.5	37.8
75–79	74.6	39.1	38.3	43.6	57.1
80–84	105.5	57.0	59.6	51.7	92.9
85+	163.2	98.4	113.4	69.5	175.4
Panel B: Death Rate Ratios vis-à-vis Non-Hispanic Whites					
Females					
65–69	1.47	0.74	0.57	1.15	1.00
70–74	1.48	0.70	0.59	1.02	1.00
75–79	1.35	0.68	0.60	0.83	1.00
80–84	1.19	0.66	0.66	0.69	1.00
85+	0.95	0.58	0.55	0.42	1.00
Males					
65–69	1.47	0.76	0.56	1.02	1.00
70–74	1.39	0.72	0.63	0.86	1.00
75–79	1.31	0.69	0.67	0.76	1.00
80–84	1.14	0.61	0.64	0.56	1.00
85+	0.93	0.56	0.65	0.40	1.00

Source: Derived from Hoyert et al. (2001).
Modified from Hummer et al. (2004).

differences may occur because racial/ethnic identification and educational attainment on the census is most often completed by the individual herself/himself or a household member, while items on the death certificate are often assigned by a funeral director (Molla et al. 2004; Rosenberg et al. 1999). Second, a number of studies have demonstrated significant levels of age misreporting on death certificates for the elderly, which can bias old age mortality estimates by race/ethnicity and education (Coale and Kisker 1986; Coale and Li 1991; Preston et al. 1996, 1999). Third, census undercounts, particularly for racial and ethnic minority populations, can artificially bias mortality estimates for these groups upward (Rosenberg et al. 1999). Nevertheless, the official NCHS mortality data remain a key source for estimating racial/ethnic and educational mortality disparities for the U.S. elderly.

Table 23.4, Panel A, shows official elderly five-year death rates per 1,000 in the U.S. in 1999 by race/ethnicity and sex. These rates were derived from Hoyert et al. (2001) and reported earlier by Hummer et al. (2004). Table 23.4, Panel B, displays rate ratios for the specific race/ethnic, age and sex groups compared with non-Hispanic white elders. The ratios in Panel B show that official mortality rates for most of the racial/ethnic minority groups (e.g., Hispanics, Asian or Pacific Islanders and Native Americans) are lower than or roughly equal to those of non-Hispanic whites at ages 65–69 and tend to become even more advantaged at the advanced ages. However, the mortality rates for non-Hispanic blacks are 30–50 per cent higher than non-Hispanic whites at ages 65–79 but converge with whites at ages 80–84 and become lower than whites among persons aged 85 and above. Mortality is higher among men than women for each racial/ethnic and age group, as expected. However, the disparities by race/ethnicity are consistent for both females and males. Note, though, that there has been reported to be much within-group heterogeneity in mortality by race/ethnicity. For example, U.S. adult mortality rates have been shown to vary quite considerably across Hispanic subpopulations (Hummer et al. 2000; Liao et al. 1998; Palloni and Arias 2004) and by nativity (Hummer et al. 1999; Singh and Siahpush 2001). There are also significant differences in racial/ethnic mortality differences by cause of death that are not shown here. For example, unadjusted relative black-white mortality disparities in the U.S. are very wide (a mortality risk ratio of two or

higher) for infectious diseases, diabetes, homicide and residual causes; around 1.2–1.5 times higher for blacks for accidents, circulatory diseases, cancer and respiratory diseases; and lower for blacks compared to whites for suicide (Rogers 1992).

A great deal of demographic work has evaluated and re-estimated black and white mortality estimates among the elderly. These re-estimates generally find that the mortality patterns for blacks and whites remain largely consistent with the patterns depicted in Table 23.4; which is, mortality rates for blacks remain higher than those of whites at most ages. The greatest old-age black-white disparities occur among those aged 65–74, while black mortality at the very oldest ages becomes lower than whites (e.g., Elo 2001; Hill et al. 2000; Johnson 2000; Lynch et al. 2003; Preston and Elo 2006; Preston et al. 1996, 1999). Refined estimates of older adult mortality also show lower Asian American mortality rates than whites, although the advantage may not be as great as demonstrated in the official NCHS data (Lauderdale and Kestenbaum 2002). Refined estimates for older aged Hispanics also continue to demonstrate lower mortality compared to whites although, again, the advantages are not as great as depicted in the official U.S. data (Elo et al. 2004).

Table 23.5 shows educational differences in old age U.S. mortality through the use of official mortality data (death certificates and census counts). The mortality rates per 1000 population in Panel A of Table 23.5 are presented for specific five-year age groups and by sex. Corresponding mortality rate ratios, relative to persons with 13 or more years of education for each age/sex group, are presented in Panel B. Both panels were originally estimated and presented by Molla et al. (2004).

The mortality rates shown in Table 23.5 demonstrate substantial differences by education, particularly among the younger groups of older adults. For example, males with 0–8 years of education had 2.2 times higher mortality in 1998 compared to males with 13+ years of education; the corresponding ratio for females was 1.7. These mortality rate differences have been shown to result in life expectancy gaps of up to five years across U.S. educational groups at age 65 (Lin et al. 2003). Educational differences in mortality are narrower at the older adult ages, as has been demonstrated for many years (e.g., Kitagawa and Hauser 1973). Nevertheless, there continue to be educational

Table 23.5 Death rates (per 1000 population) and rate ratios by educational level for individuals aged 65–84 in the United States, Official U.S. Mortality Data, 1998

	Years of education					
	Females			Males		
	0–8	9–12	13+	0–8	9–12	13+
Panel A: Death Rates						
Ages 65–69	20.6	16.9	11.3	34.4	31.8	16.0
Ages 70–74	29.0	27.2	17.4	45.6	45.6	27.5
Ages 75–79	42.5	42.5	26.5	68.2	64.5	42.8
Ages 80–84	66.2	69.8	49.8	101.0	104.3	69.4
Panel B: Death Rate Ratios vis-à-vis Individuals with 13+ Years of Education						
Ages 65–69	1.7	1.2	–	2.2	1.5	–
Ages 70–74	1.6	1.1	–	1.8	1.3	–
Ages 75–79	1.5	1.1	–	1.5	1.1	–
Ages 80–84	1.2	1.1	–	1.5	1.2	–

Source: Taken from Molla et al. (2004: Table 2: 631). The death rates were calculated by Molla et al. using numerator data (death certificates) from the National Center for Health Statistics and denominator data (population counts by age, sex and education) from the U.S. Census Bureau.

mortality differences for both females and males at ages 80–84. Moreover, relative mortality differences by education are consistently larger among older U.S. men compared to older U.S. women. That is, within each age group, the rate ratio for less educated males is consistently higher than the rate ratio for less educated females. However, these overall mortality differentials by education also contain a great deal of potential heterogeneity by race/ethnicity, nativity and other sociodemographic factors. Further, there may be considerable mortality variation within the educational groupings shown here; for example, individuals who achieve 12 years of schooling are most often high school graduates in the U.S., while those with 9–11 years of schooling most often are not. While it is possible that important educational credentials, such as a high school degree or a college degree, may be related with older age health and mortality outcomes, one recent analysis demonstrated no additional effects of educational credentials beyond the basic effect of years of education on U.S. adult health outcomes (Ross and Mirowsky 1999).

Table 23.6 uses the NHIS-LMF linked data set from 1986 to 2002 (NCHS 2007) to show estimated racial/ethnic and educational disparities in older adult (65 and above) mortality for women and men in the United States. Using this data set allows for consistent reports of race/ethnicity and education for both the numerator and denominator of the mortality estimates and allows the differential mortality

estimates to be controlled for individual years of age. Data in these tabs include 167,143 individuals (98,095 women and 69,048 men) aged 65 and older at the time of the baseline interviews, which were conducted in 15 different NHIS survey years, 1986 through 2000. Mortality follow-up for these individuals was assessed through the end of 2002, which resulted in 71,513 deaths. Only non-Hispanic whites and non-Hispanic blacks are included in these models because of the high quality of statistical death matching for these groups that is lacking in other racial/ethnic groups (NCHS 2007). Hazard models are used to specify separate sex-specific models of mortality risk as a function of age (in single years), race/ethnicity (non-Hispanic blacks compared to non-Hispanic whites), educational categories (with individuals having a college degree or higher serving as the reference category), a race/ethnicity by age interaction term (which accounts for the possible narrowing of mortality differences between non-Hispanic blacks and non-Hispanic whites with increasing age) and a set of education by age interaction terms (which also account for the possible narrowing of mortality differences between the educational groups with age).

Model 1 in the top panel of Table 23.6 shows that non-Hispanic black women aged 65 and higher exhibit a 10 per cent higher overall risk of mortality than non-Hispanic white women, controlling for age. The race differential is only slightly higher (13 per

Table 23.6 Mortality differentials by race/ethnicity and education (presented as hazard ratios) for U.S. women and men aged 65 and above, 1986–2002, Calculated Using NHIS–LMF Data

	Model 1	Model 2	Model 3	Model 4
Women				
Age (continuous)	1.10*	1.10*	1.10*	1.12*
Race/Ethnicity [NH White]				
– Non-Hispanic Black	1.10*	1.45*	1.38*	1.33*
Age by Non-Hispanic Black		0.98*	0.98*	0.98*
Education [16+ years]				
– Education < 9 years			1.32*	1.73*
– Education 9–11 years			1.30*	1.73*
– Education 12 years			1.17*	1.38*
– Education 13–15 years			1.08*	1.24*
– Education unknown			1.22*	1.02
Age by Education <9				0.98*
Age by Education 9–11				0.98*
Age by Education 12				0.99*
Age by Education 13–15				0.99*
Age by Education Unknown				1.01
N	98,095	98,095	98,095	98,095
Men				
Age (continuous)	1.09*	1.09*	1.09*	1.11
Race/Ethnicity [NH White]				
– Non-Hispanic Black	1.13*	1.34*	1.24*	1.17*
Age by Non-Hispanic Black		0.98*	0.98*	0.99*
Education [16+ years]				
– Education <9years			1.48*	1.87*
– Education 9–11 years			1.44*	1.73*
– Education 12 years			1.28*	1.41*
– Education 13–15 years			1.16*	1.28*
– Education unknown			1.35*	1.91*
Age by Education <9				0.98*
Age by Education 9–11				0.98*
Age by Education 12				0.99*
Age by Education 13–15				0.99*
Age by Education Unknown				0.97*
N	69,048	69,048	69,048	69,048

Source: National Center for Health Statistics (2007).

* $p < .01$

cent higher mortality risk for blacks) when looking at men in the bottom half of the table. Model 2 adds an age by race interaction term for both women and men. Age is measured in single years from age 65 to 99 but is coded here as 0–34 so that the main effect of race can be understood as the relative race differential in mortality at age 65. The results in Model 2 for both sexes reconfirm the convergence and ultimate crossover of black-white mortality disparities with

age. That is, the age by race hazard ratio of 0.98 for both sexes means that race differences in mortality converge throughout older adulthood and are estimated to crossover in the mid-to-late 80s. Model 2 for women also demonstrates that at age 65 non-Hispanic blacks exhibit a 45 per cent higher risk of death compared to non-Hispanic whites; for men, blacks demonstrate a 34 per cent higher mortality risk at age 65 compared to whites.

Model 3 shows the overall mortality differences by education at these older adult years. For both sexes, those with less than nine years of education exhibit the highest mortality and those with 16 or more years exhibit the lowest mortality. Thus, in addition to the three categories of education shown in Table 23.5 and estimated by Molla et al. (2004), more refined educational categories are very useful for best demonstrating educational differences in older adult mortality. For example, men with less than 9 years of education exhibit 48 per cent higher old age mortality than men with 16 or more years of education. In turn, women with less than 9 years of education exhibit 32 per cent higher mortality compared with women who have 16 or more years of education.

Finally, Model 4 adds a set of age by education interaction terms for both women and men, respectively. As with the age by race interaction effect, the age by interaction terms demonstrate decreasing educational differences in mortality with increasing age. Moreover, the educational differences in mortality at age 65, shown by the hazard ratios for the main effects of education, demonstrate very wide relative disparities for both women and men. Women with less than 12 years of education exhibit 73 per cent higher mortality than women with 16 or more years of education at age 65, net of age and race differences. The relative educational differences in mortality at age 65 for men are even wider. It is clear from these results that the United States has a long way to go before older adult mortality rate disparities by both race and education are eliminated.

Conclusion and Future Research Directions

Life expectancy at birth and at age 65 witnessed remarkable increases in the United States and throughout the world in the 20th Century. Life expectancies for 65 year olds increased from 11.9 to 18.7 years, an impressive 57 per cent increase, between 1900–02 and 2004 in the United States (Arias 2006; Miniño et al. 2007). These life expectancy increases are due to a variety of factors, including much improved standards of living, reductions in such risky behavior as cigarette smoking, improved medical technology and better public health infrastructure.

The sex gap in U.S. life expectancy at age 65 closed from 4.2 years in 1979–1981 to 3.0 years in 2003, due to faster recent declines in mortality among males. Indeed, between 1985 and 2003, compared to females, males have seen greater declines in most major causes of death, including heart disease, malignant neoplasms and chronic lower respiratory diseases. All of these diseases are related to cigarette smoking. It is plausible that smoking is the major contributor to the narrowing sex gap in life expectancy (see Pampel 2002; Preston and Wang 2006), even among the elderly. Over time, a large proportion of males have quit smoking, while a substantial proportion of females have continued smoking. The percentage of individuals aged 65 and above who are current cigarette smokers exhibits dramatic trends: between 1965 and 2002, the percentage of U.S. male current smokers at ages 65 and above gradually declined from 28.5 to just 9.6 per cent, whereas the percentage female current smokers was 9.6 per cent in 1965, climbed to 13.7 per cent in 1987 and then declined to 8.6 per cent in 2002 (FIFOARS 2004). These huge declines among males and fairly stable patterns among females in cigarette smoking prevalence rates could explain why some major causes of death – such as malignant neoplasms and chronic lower respiratory diseases – have declined for males but increased among females.

Nevertheless, sex differences in mortality are not fully understood. Female advantages are related to complex factors that include sex hormones (Waldron 1983), social networks (Moen et al. 1989) and expectations and behaviors associated with gender roles (Nathanson 1984). While the sex differences in mortality have recently been converging, a future decrease in female smoking may once again increase this gap, whereas greater additional declines in male smoking has the potential to close the gap even further (Preston and Wang 2006).

By race, U.S. blacks continue to exhibit substantially higher mortality than whites at ages 65–80, with small differences beyond age 80 and a mortality crossover at the very old ages. A recent comparison of U.S. black-white mortality differentials with those reported by Elo and Preston (1997) from roughly a decade previous show no evidence of closure of the black-white mortality gap among the younger elderly population, even in the recent context of declining mortality for all groups (Hummer et al. 2004). Thus, while the over-

all reductions in mortality among all age groups and among the elderly has been a very positive story for the U.S. for a long time, the stubborn race differences remain a source of major concern. This chapter also documented continued educational differences in mortality among the elderly population of the U.S. Similar to the patterns for race, larger educational differences are concentrated about the younger elderly population with smaller differentials among the older portion of the elderly population. Such continuing educational differences in U.S. older adult mortality suggest that there remains room for significant mortality improvement for certain subgroups of the population.

This chapter focused on age, sex, race/ethnic and education patterns of older adult mortality. Other important factors – such as health behaviors, including tobacco use, alcohol consumption, illicit drug use, diet and exercise; health conditions, including obesity and diabetes; and environmental and neighborhood factors, including crime, safety and community support – are also associated with mortality patterns in late life (Rogers et al. 2005). Thus, while we have identified some of the major demographic and socioeconomic factors that characterize late life mortality patterns, there are surely other avenues of research available that can contribute to this already rich body of literature.

Data issues continue to hinder a more complete understanding of older adult mortality patterns among the U.S. elderly. Much of what is known about mortality among the elderly in the United States continues to be based on vital statistics data, which, while crucial for their trends, detail, size and coverage, have well-known limitations, particularly for understanding population subgroup mortality levels and patterns. Matches between large survey based data sets and mortality follow-up records (e.g., the NHIS-NDI and the NLMS) have allowed for much more in-depth examinations of old age mortality patterns in recent years but even those data sources have important coverage gaps and matching problems. At the same time, such survey-based data sets most likely present the most promising future opportunities for the more complete documentation and understanding of older adult mortality patterns in the United States.

Based on past mortality trends, current projections and international comparisons, it is likely that life expectancies among the elderly will continue to improve in the U.S. and most other high income countries. These life expectancy improvements con-

tribute to population aging, with greater numbers and proportions of the population in the oldest old ages (85 and above). An aging population may have large impacts on the structure of health care and social services and lead to changing family dynamics. Increasing life expectancies among the elderly can also contribute to deeper, richer and more complex social relationships with longer durations; opportunities for individuals to engage in various social and community activities; and greater chances of increased connections among generations (Riley 1983). Indeed, these additional years can translate into increased opportunities for individuals to not only become grandparents and great-grandparents but to have a greater number of years to interact with their children, grandchildren and great-grandchildren, in addition to other relatives.

The last century has been characterized by enormous increases in life expectancy, measured both at birth and at age 65, which have helped bring about significant changes in the demographic and social structures among the older population. With continuing prospects for improved medical technology and preventive care, better health behavior over the life course and less exposure to early childhood diseases, the next hundred years may lead to even greater improvements in the mortality of older adults in the United States and throughout the world.

Acknowledgement We gratefully acknowledge support from NICHD grant number 1 R01 HD053696 in the preparation of this chapter, as well as the NICHD-funded University of Texas at Austin Population Research Center (grant number R24 HD42849) and University of Colorado Population Center (grant number R21 HD51146) for computing and administrative support. We also thank Mark Hayward, Starling Pullum and Hyeyoung Woo for helpful comments and assistance.

References

- Allison P (1984) Event history analysis: regression for longitudinal event data. Sage Publications, Beverly Hills, CA
- Arias E (2006) United States life tables, 2003. *Natl Vital Stat Rep* 54(14):1–40
- Anderson RN (1999) U.S. decennial life tables for 1989–1991. vol 1, No 4. *United States Life Tables Eliminating Certain Causes of Death*, vol 1, no 4. National Center for Health Statistics, Hyattsville, MD
- Armstrong RJ (1997) U.S. Decennial life tables for 1989–1991. vol 1, no 1. National Center for Health Statistics, Hyattsville, MD
- Barker DJP (1998) *Mothers, babies, and health in later life*. Churchill Livingstone, London

- Beckett M (2000) Converging health inequalities in later life: An artifact or mortality selection? *J Health Soc Beh* 41:106–119
- Bongaarts J (2007) How long will we live? *Popul Dev Rev* 32(4):605–628
- Carnes BA, Olshansky SJ (1993) Evolutionary perspectives on human senescence. *Popul Dev Rev* 19(4):793–806
- Carnes BA, Olshansky SJ (2007) A realist view of aging, mortality, and future life expectancy. *Popul Dev Rev* 33(2):367–381
- Coale AJ, Kisker EE (1986) Mortality crossovers: Reality or bad data? *Popul Stud* 40:389–401
- Coale AJ, Kisker EE (1990) Defects in data on old-age mortality in the United States: New procedures for calculating mortality schedules and life tables at the highest ages. *Asian Pac Popul Forum* 4(1):1–31
- Coale AJ, Li S (1991) The effect of age misreporting in China on the calculation of mortality rates at very high ages. *Demography* 28(2):293–301
- Corti MC, Guralnik JM, Ferrucci L, Izmirlian G, Leveille SG, Pahor M, Cohen HJ, Pieper C, Havlik RJ (1999) Evidence for a black-white crossover in all-causes and coronary heart disease mortality in an older population: The North Carolina EPESE. *Am J Public Health* 89(3):308–314
- Cox DR (1972) Regression models and life tables. *J Royal Stat Soc. B* 34:187–220
- Crimmins EM (2005) Socioeconomic differentials in mortality and health at the older ages. *Genus* LXI(1):163–177
- Crimmins EM, Finch CE (2006) Infection, inflammation, height, and longevity. *PNAS* 103(2):498–503
- Elo IT (2001) New African American life tables from 1935–1940 to 1985–1990. *Demography* 38:97–114
- Elo IT, Preston SH (1992) Effects of early-life conditions on adult mortality: A review. *Popul Index* 58(2):186–212
- Elo IT, Preston SH (1997) Racial and ethnic differences in mortality at older ages. In: Martin LG, Soldo BJ (eds) *Racial and ethnic differences in the health of older Americans*, National Academy Press, Washington, DC, pp 10–42
- Elo IT, Turra CM, Kestenbaum B, Ferguson BR (2004) Mortality among elderly hispanics in the United States: Past evidence and new results. *Demography* 41(1):109–128
- Everett BG, Rogers RG, Krueger PM, Hummer RA (2007) Trends in educational attainment by sex, race/ethnicity, and nativity in the United States, 1989–2005. University of Colorado Population Program Working Paper POP2007-07 (<http://www.colorado.edu/ibs/pop/pubs/wp.html>).
- Federal Interagency Forum on Aging Related Statistics (2004) *Older Americans 2004: Key indicators of well-being*. U.S. Government Printing Office, Washington, DC
- Feldman J, Makuc D, Kleinman J, Cornoni-Huntley J (1989) National trends in educational differences in mortality. *Am J Epidemiol* 129:919–933
- Finch CE (1990) *Longevity, senescence, and the genome*. The University of Chicago Press, Chicago
- Fogel RW, Costa DL (1997) A theory of technophysio evolution, with some Implications for forecasting population, health care costs, and pension costs. *Demography* 34(1):49–66
- Ford ES, Ajani UA, Croft JB, Critchley JA, Labarthe DR, Kottke TE, Giles WH, Capewell S (2007) Explaining the decrease in U.S. deaths from coronary disease, 1980–2000. *New Engl J Med* 356(23):2388–2398
- Fries JF (1980) Aging, natural death, and the compression of morbidity. *New Engl J Med* 303:130–135
- Gage TB (1994) Population variation in cause of death: Level, gender, and period effects. *Demography* 31(May):271–296
- Grodstein F, Stampfer MJ, Colditz GA, Willett WC, Manson JE, Joffe M, Rosner B, Fuchs C, Hankinson SE, Hunter DJ, Hennekens CH, Speizer FE (1997) Postmenopausal hormone therapy and mortality. *New Engl J Med* 336:1769–1775
- Grove GL, Kligman AM (1983) Age-associated changes in human epidermal cell renewal. *J Gerontol* 38:137–142
- Hayward MD (2007) Bringing the body back into aging and life course research. Presentation given at the annual meeting of the American Sociological Association, New York, NY
- Hayward MD, Gorman BK (2004) The long arm of childhood: The influence of early-life social conditions on men's mortality. *Demography* 41(1):87–107
- Hayward MD, Heron M (1999) Racial inequality in active life among adult Americans. *Demography* 36(1):77–91
- Hayward MD, Warner DF (2005) The demography of population health. In: Dudley P, Micklin M (eds) *Handbook of population*, Chap 27, Springer Publishers, New York
- Hertzman C (2004) The life-course contribution to ethnic disparities in health. In Anderson NB, Bulatao RA, Cohen B (eds) *Critical perspectives on racial and ethnic differences in health in late life*, National Academies Press, Washington, DC, pp 145–170
- Hill ME, Preston SH, Rosenwaive I (2000) Age reporting among white Americans aged 85+: Results of a record linkage study. *Demography* 37(2):175–186
- Horiuchi S (1997) Postmenopausal acceleration of age-related mortality increase. *J Gerontol Biol Sci* 52A(1):878–892
- Horiuchi S, Coale AJ (1990) Age patterns of mortality for older women: An analysis using the age-specific rate of mortality change with age. *Math Popul Stud* 2:245–267
- Horiuchi S, Wilmoth JR (1998) Deceleration in the age pattern of mortality at older ages. *Demography* 35(4):391–412
- House JS, Kessler RC, Herzog AR, Mero RP, Kinney AM, Breslow MJ (1990) Age, socioeconomic status and health. *Milbank Q* 68:383–411
- Hoyert DL, Arias E, Smith BL, Murphy SL, Kochanek KD (2001) Deaths: final data for 1999. *National Vital Statistics Reports* 49(8): National Center for Health Statistics.
- Human Life-Table Database. www.lifetable.de
- Human Mortality Database. University of California, Berkeley (USA), and Max Planck Institute for Demographic Research (Germany). Available at www.mortality.org or www.humanmortality.de
- Hummer RA, Benjamins MR, Rogers RG (2004) Racial and ethnic disparities in health and mortality among the US elderly population. In: Anderson NB, Bulatao RA, Cohen B (eds) *Critical perspectives on racial and ethnic differences in health in late life*, National Academies Press, Washington, DC, pp 53–94
- Hummer RA, Rogers RG, Amir SH, Forbes D, Frisbie WP (2000) Adult mortality differentials between hispanic subgroups and non-hispanic whites. *Soc Sci Q* 81:459–476
- Hummer RA, Rogers RG, Nam CB, LeClere FB (1999) Race/ethnicity, nativity, and U.S. adult mortality. *Soc Sci Q* 80:136–153

- Jeune B, Vaupel JW (eds) (1999) Validation of exceptional longevity. Odense University Press.
- Johnson NE (2000) The racial crossover in comorbidity, disability, and mortality. *Demography* 37(3):267–283
- Kestenbaum B (1992) A description of the extreme aged population based on improved medicare enrollment data. *Demography* 29:565–580
- Keyfitz N (1985) Applied mathematical demography, 2nd edn. Springer, New York
- Khazaeli AA, Xiu L, Curtsinger JW (1995) Stress experiments as a means of investigating age-specific mortality in *Drosophila melongaster*. *Exp Gerontol* 30:177–184
- Kintner HJ (2004) The life table. In: Siegel JS, Swanson DA (eds) The methods and materials of demography, 2nd edn. Elsevier Academic Press, New York, pp 301–340
- Kitagawa EM, Hauser PM (1973) Differential mortality in the United States: A study in socioeconomic epidemiology. Harvard University Press, Cambridge MA
- Lauderdale, DS (2001) Education and survival: Birth cohort, period, and age effects. *Demography* 38(4):551–561
- Lauderdale DS, Kestenbaum B (2002) Mortality rates of elderly Asian American populations. *Demography* 39(3):529–540
- Lee RD, Carter LR (1992) Modeling and forecasting United States mortality. *J Am Stat Assoc* 87:659–671
- Liao Y, Cooper R, Cao G, Durazo-Arvizu R, Kaufman J, Luke A, McGee D (1998) Mortality patterns among adult Hispanics: Findings from the NHIS, 1986–1990. *Am J Public Health* 88:227–232
- Lin CC, Rogot E, Johnson NJ, Sorlie PD, Arias E (2003) A further study of life expectancy by socioeconomic factors in the national longitudinal mortality study. *Ethn Dis* 13:240–247
- Lynch SM (2003) Cohort and life-course patterns in the relationship between education and health: A hierarchical approach. *Demography* 40(2):309–331
- Lynch SM, Brown JS, Harmsen KG (2003) Black-white differences in mortality compression and deceleration and the mortality crossover reconsidered. *Res Aging* 25(5):456–483
- Manton KG (1992) Mortality and life expectancy changes among the oldest old. In: Suzman RM, Willis DP, Manton KG (eds) The oldest old, Oxford University Press, New York, pp 157–182
- Manton KG, Poss SS, Wing S (1979) The black/white mortality crossover: Investigation from the perspective of the components of aging. *Gerontologist* 19:291–300
- Manton KG, Stallard E (1997) Health and disability differences among racial and ethnic groups. In: Martin LG, Soldo BJ (eds) Racial and ethnic differences in the health of older Americans, National Academy Press, Washington, DC, pp 43–104
- Manton KG, Stallard E, Woodbury MA, Dowd JE (1994) Time-varying covariates in models of human mortality and aging: multidimensional generalization of the gompertz. *J Gerontol* 49(4):B169–190
- Miniño AM, Heron MP, Murphy SL, Kochanek KD (2007) Deaths: final data for 2004. *Nat Vital Stat Rep.* 55(19): 1–120
- Moen P, Dempster-McClain D, Williams Jr. RM (1989) Social integration and longevity: An event history analysis of women's roles and resilience. *Am Sociol Rev* 54:635–647
- Mohai P (1997) Gender differences in perception of most important environmental problems. *Race Gend Class* 5(1): 153–169
- Molla MT, JH Madans, DK Wagener (2004) Differentials in adult mortality and activity limitation by years of education in the United States at the end of the 1990s. *Popul Dev Rev* 30(4):625–646
- Mueller LD, MR Rose (1996) Evolutionary theory predicts late-life mortality plateaus. *PNAS* 93:15249–15253
- Nam CB (1995) Another look at mortality crossovers. *Soc Biol* 42(1–2):133–142
- Nam CB, Weatherby NL, Ockay KA (1978) Causes of death which contribute to the mortality crossover effect. *Soc Biol* 25:306–314
- Nathanson CA (1984) Sex differences in mortality. *Annu Rev Sociol* 10:191–213
- Nathanson CA, Lopez AD (1987) The future of sex mortality differentials in industrialized countries: A structural hypothesis. *Popul Res Policy Review* 6(1):123–136
- National Center for Health Statistics (2007) National health interview survey: Multiple cause of death public use data file, 1986–2000 Survey Years. Computer file and documentation. Hyattsville, MD: Public Health Service
- National Center for Health Statistics (2003) Health, United States, 2003. Hyattsville, MD
- National Center for Health Statistics (2004) Health, United States, 2004. Hyattsville, MD
- National Center for Health Statistics (2006) Health, United States, 2006. Hyattsville, MD
- National Research Council (1997) Racial and ethnic differences in the health of older Americans, In: Martin LG, Soldo BJ (eds) Committee on population, committee on behavioral and social sciences and education, National Academy Press, Washington, DC
- National Research Council (2004) Critical perspectives on racial and ethnic differences in health in late life. In: Anderson NB, Bulatao RA, Cohen B (eds) Panel on race, ethnicity, and health in later life. committee on population, division of behavioral and social sciences and education. National Academy Press, Washington, DC
- Newell C (1988) Methods and models in demography. The Guilford Press, New York
- Oeppen J, Vaupel JW (2002) Broken limits to life expectancy. *Science* 296(5570):1029–1031
- Olshansky SJ, Ault B (1986) The fourth stage of the epidemiologic transition: The age of delayed degenerative diseases. *Milbank Q* 64(3):355–391
- Olshansky SJ, Carnes BA, Desesquelles A (2001) Demography: Prospects for human longevity. *Science* 291(5508): 1491–1492
- Omran AR (1971) The epidemiologic transition: A theory of the epidemiology of population change. *Milbank Mem Fund Q* 49:509–538
- Omran AR (1977) Epidemiologic transition in the US. *Popul Bull* 32(2):1–42
- Palloni A, Arias E (2004) Paradox lost: Explaining the hispanic adult mortality advantage. *Demography* 41(3):385–415
- Pampel FC (2002) Cigarette use and the narrowing sex differential in mortality. *Popul Dev Rev* 28(1):77–104
- Parnell AM, Owens CR (1999) Evaluation of U.S. mortality patterns at old ages using the medicare enrollment data base. *Demogr Res* 1(2): <http://www.demographic-research.org/Volumes/Vol1/2/>

- Preston SH, Elo IT (2006) Black mortality at very old ages in official us life tables: A skeptical appraisal. *Popul Dev Rev* 32(3):557–565
- Preston SH, Elo IT, Rosenwaike I, Hill M (1996) African-American mortality at older ages: Results of a matching study. *Demography* 33(2):193–209
- Preston SH, Elo IT, Stewart Q (1999) Effects of age misreporting on mortality estimates at older ages. *Popul Stud* 53(1999): 165–177
- Preston SH, Heuveline P, Guillot M (2001) *Demography: Measuring and modeling population processes*. Blackwell Publishers, Oxford
- Preston SH, Taubman P (1994) Socioeconomic differences in adult mortality and health status. In: Martin LG, Preston SH *Demography of aging*, National Academy Press, Washington, DC, pp 279–318
- Preston SH, Hill ME, Drevenstedt GL (1998) Childhood conditions that predict survival to advanced ages among African Americans. *Soc Sci Med* 47:1231–1246
- Preston SH, Wang H (2006) Sex mortality differences in the United States: The role of cohort smoking patterns. *Demography* 43(4):631–646
- Riley MW (1983) The family in an aging society: A matrix of latent relationships. *J Family Issues* 4(3):439–454
- Robine JM, Allard M (1999) Jeanne Calment: Validation of the duration of her life. In: Jeune B, Vaupel JW (eds) *Validation of exceptional longevity*. Odense University Press, pp 145–162
- Rogers A, Rogers RG, Belanger A (1990) Longer life but worse health? Measurement and dynamics. *Gerontologist* 30(5):640–649
- Rogers RG (1992) Living and dying in the USA: Sociodemographic determinants of death among blacks and whites. *Demography* 29(2):287–304
- Rogers RG (1995) Marriage, sex, and mortality. *J Marriage Fam* 57(2):515–526
- Rogers RG, Hummer RA, Krueger PM (2005) Adult mortality. In: Poston D, Micklin M. *Handbook of population*, Chap 10, Springer Publishers, New York, pp 283–309
- Rogers RG, Hummer RA, Krueger PM, Pampel FC (2005) Mortality attributable to cigarette smoking in the United States. *Popul Dev Rev* 31(2):259–292
- Rogers RG, Hummer RA, Nam CB (2000) Living and dying in the USA: Social, behavioral, and health differentials in adult mortality. Academic Press, New York
- Rosenberg HM, Maurer JD, Sorlie PD, Johnson NJ, MacDorman MF, Hoyert DL, Spitler JF, Scott C (1999) Quality of death rates by race and hispanic origin: A summary of current research. *Vital Health Stat* 2(128):1–59
- Ross CE, Wu C (1995) The links between education and health. *Am Sociol Rev* 60(5):719–745
- Ross CE, Wu C (1996) Education, age, and the cumulative advantage in health. *J Health Soc Behav* 37:104–120
- Ross CE, Mirowsky J (1999) Refining the association between education and health: The effects of quantity, credential, and selectivity. *Demography* 36(4):445–460
- Schulz R, Beach SR (1999) Caregiving as a risk factor for mortality: The caregiver health effects study. *JAMA* 282: 2215–2219
- Singh GK, Siahpush M (2001) All-Cause and cause-specific mortality of immigrants and native born in the United States. *Am J Public Health* 91:392–399
- Smith JP (2005) Unraveling the SES-health connection. *Popul Dev Rev* 31(Suppl):108–132
- Sorlie PD, Backlund E, Keller J (1995) U.S. mortality by economic, demographic, and social characteristics: the national longitudinal mortality study. *Am J Public Health* 85:949–956
- United Nations (2004) *Demographic Yearbook 2004*. <http://unstats.un.org/unsd/demographic/products/dyb/dyb2.htm>. Accessed March 6, 2007
- U.S. Department of Health and Human Services (2000) *Healthy people 2010: Understanding and improving health*. 2nd ed. USGPO, Washington, DC
- Vaupel JW (1997) Trajectories of mortality at advanced ages. In: Wachter KW, Finch CE (eds) *Between Zeus and the Salmon: The biodemography of longevity*, Chap 2. National Academy Press, Washington, DC, pp 17–37
- Vaupel JW, Manton KG, Stallard E (1979) The impact of heterogeneity in individual frailty on the dynamics of mortality. *Demography* 16(3):439–454
- Waite LJ, Gallagher M (2000) *The case for marriage: Why married people are happier, healthier, and better off financially*. Doubleday, New York
- Waldron I (1983) Sex differentials in human mortality: The role of genetic factors. *Soc Sci Med* 17(6):321–333
- Williams DR (1990) Socioeconomic differentials in health: A review and redirection. *Soc Psychol Quart* 53:81–99
- Wilmoth JR (1997) In search of limits. In: Wachter KW, Finch CE (eds) *Between Zeus and the Salmon: The biodemography of longevity*, Chap 3. National Academy Press, Washington, DC, pp 38–64
- Wilmoth JR (2001) How long will we live? A review essay. *Popul Dev Rev* 27(4):791–800
- Wilmoth JR, Deegan LJ, Lundstrom H, Horiuchi S (2000) Increase of maximum life-span in Sweden, 1861–1999. *Science* 289:2366–2368
- World Health Organization (2000) WHO issues new healthy life expectancy rankings: Japan number one in new 'healthy life' system. Press Release WHO. Washington, D.C. and Geneva, Switzerland. <http://www.who.int/inf-pr-2000/en/pr2000-life.html>

Chapter 24

Active Life Expectancy: A Central Measure of Population Health

Sarah B. Laditka and James N. Laditka

Introduction

An important aspect of population health is increasingly measured by disability indicators. Active life expectancy, also often referred to as health expectancy, has emerged as a useful indicator of population health. This indicator was first proposed by the U.S. Department of Health, Education and Welfare (1969) nearly 40 years ago and has been widely adopted for use by the World Health Organization and governments throughout the world to monitor population health. Researchers commonly partition total life expectancy into two parts. One part is healthy life expectancy, also often referred to as active life expectancy or disability-free life expectancy. This component is a measure of the years an individual can expect to live free of disability. The second part measures the years a person can expect to live with disability, also commonly referred to as inactive life expectancy or disabled life expectancy. Although the phrase “active life expectancy” refers to the period of life without disability, the same phrase is often used to describe this entire research area. Thus, a researcher who studies active life expectancy is interested to estimate the periods of life spent with and without disability.

A rapidly growing number of researchers are studying active life expectancy, sometimes also referred

to as “health expectancy.” An international group of research scientists, known as the International Network on Health Expectancy and the Disability Process, or REVES (Réseau Espérance de Vie en Santé), has developed and compared various measures of active life expectancy across countries and time periods to evaluate changes in health expectancies among populations. Estimates of active life expectancy are available for 49 countries as of 1999 (Jagger et al. 2005). A comprehensive review and synthesis of research conducted by the REVES network scientists has been published (Robine et al. 2003). Further, the number of publications focusing on active life expectancy has grown dramatically over the past five years, in peer reviewed journals as well as in special journal issues devoted to active life expectancy and in edited volumes (Jagger et al. 2005; Laditka 2002; Olshansky and Wilkins 1998; Robine et al. 2003; Yi et al. 2006.). In addition, REVES maintains a comprehensive website, including information about research that members of its network are conducting (<http://www.prw.le.ac.uk/cgibin/reves/history.cgi> 2006).

Many developed and developing countries enjoyed dramatic life expectancy gains over the last century (U.S. Census Bureau 2000; Vaupel et al. 1998). The substantial increase in life expectancy is one of the greatest public health achievements of the twentieth century. Most of the gain came from controlling infectious diseases and improving public health early in the century (Fuchs 1974; Olshansky et al. 1997). Beginning in the 1960s, death rates for fatal diseases often associated with older age fell considerably. This trend particularly affected cardiovascular diseases, such as stroke and heart disease (Davis et al. 1985; McGovern et al. 1992).

S. B. Laditka (✉)
Department of Public Health Sciences
University of North Carolina at Charlotte
9201 University City Boulevard
Charlotte, NC, USA
E-mail: sladitka@uncc.edu

Reduced mortality from major fatal diseases brought even more years of life for the average individual. However, during the 1960s and 1970s, these longevity gains also brought additional years spent in worse health (Colvez and Blanchet 1981; Crimmins et al. 1989).

From the late 1980s to the present, research indicates that another major epidemiological shift may have occurred in the United States and in many other developed countries. Studies increasingly suggest that the proportion of the older population with severe disability has declined (Doblhammer and Kytir 2001; Freedman et al. 2004; Freedman and Martin 1998; Freedman et al. 2002; Manton et al. 1993). This decline in the prevalence of disability has been attributed to many factors, including better knowledge of healthy lifestyle choices, advances in medical treatment and technology, prescription drugs and use of assistive devices (Cutler et al. 2006; Freedman et al. 2005; Fries 2002; Rowe and Kahn 1998; Vita et al. 1998).

The trends in population health just described illustrate the importance of monitoring the relationship between total life expectancy and the proportion of life spent in good health. Monitoring this relationship is particularly important because various groups in the population, distinguished by gender, race and ethnicity, socioeconomic status and other characteristics, may have widely differing expectancies for longevity and for health at older ages. These differences have major implications for needs for health care and social services, public health priorities and costs to individuals, families and governments. Policymakers, practitioners and researchers agree that the demand for health care resources and expenditures for health care and other services for older people depend on both the number of older people and their health status (Jacobzone 2000; Lubitz et al. 1995, 2003). However, the relationship between changing disability levels and use of formal and informal services is complex. Although use and cost outcomes depend on many factors, the large increases in life expectancy and growth in the number of older populations worldwide, has made disability a linchpin for understanding health care resource needs. Given the increase in global aging (Kinsella and Gist 1998), planning for the transition from full health to levels of disability is essential to develop services that can help older people live in their communities and to

forecast financial resources needed to care for older people (Lubitz et al. 2003).

Although the phrases “active life expectancy” and “healthy life expectancy” are often used interchangeably, it is possible to distinguish between these concepts. A physically disabled individual may be free of significant health problems. For example, physically disabled individuals now regularly win Olympic medals and have climbed Mount Everest. Similarly, an individual with health problems can be nondisabled, when evaluated using common disability measures. Nonetheless, the two phrases are often used interchangeably. Similarly, for the purposes of this review, we use the terms impairment, functional limitation and disability interchangeably. Researchers often distinguish among these terms: having an impairment in physical function does not necessarily mean that one has a functional limitation and whether a functional limitation means being “disabled” is in part determined by socially constructed barriers to transportation, the workplace, public and private buildings. Nonetheless, in the active life expectancy literature, these terms are also often used interchangeably, with the terms “disabled” or “disability” being used most commonly to describe periods spent with impairments or functional limitations.

This chapter presents a critical review of the active life expectancy literature, including international studies as well as those conducted in the United States. Building on an earlier review (Laditka and Laditka 2002), our purpose is to review and critique representative theoretical articles, empirical studies and review articles, with a focus on those published during the past 15 years. Most methods for studying active life expectancy require accurate and detailed data about health and mortality, either for a large number of representative individuals or an entire population. Until recently, these data have generally been available only for developed countries. Although we address research on less developed countries, our review is similarly bounded. We begin, in the following section, by summarizing the principal methods that have been used to calculate active life expectancy. Then, we describe important individual characteristics often associated with substantial differences in active life expectancy – including demographic, economic and behavioral or lifestyle characteristics – and describe the major findings in each area. Many

researchers studying active life expectancy examine trends in active life to determine whether there has been a compression or expansion of morbidity. Evidence for a compression of morbidity would suggest that people are living a greater proportion of life free of disease and disability. In contrast, evidence for an expansion of morbidity would suggest that the proportion of life lived with disability is growing. Recent studies provide evidence that the disabled proportion of the population is increasing as mortality rates fall but that this increase is accompanied by a reduction in the rate at which chronic diseases progress. Some scholars refer to this combination of trends as evidence of the dynamic equilibrium theory. We review the recent evidence for these three theories. The chapter concludes with implications for practice, policy and research.

Major Approaches to Calculate Active Life Expectancy

In this section, we summarize the most commonly used methods to calculate total, active and inactive life expectancy, building on the discussion by Laditka and Hayward (2003). The earliest method to estimate parameters of active life expectancy is prevalence-based life tables, also often referred to as the Sullivan (1971) method. This approach was developed in the 1930s and was used first to estimate work histories. Regarding data “inputs,” the Sullivan method usually combines current mortality incidence rates with the age-specific proportions of the population that are in good health and those who are disabled. The prevalence estimates of health status are often derived from large cross-sectional surveys or population censuses. Thus, they provide a measure of the health status of an observed population. The Sullivan method assumes that once an individual becomes disabled, recovery is not possible. This assumption impedes modeling realistic profiles of functional transitions over the life cycle, as there is evidence that older individuals may often recover from periods of disability (Hardy and Gill 2004; Laditka and Wolf 2006). Nonetheless, the Sullivan method offers a number of advantages. It is straightforward to apply. A manual that describes the use of the Sullivan approach is available (Jagger

1999). Importantly, it can be applied with data from cross-sectional studies, which are much more readily available than longitudinal data and can provide regular estimates of population health. Further, the sample sizes of these health surveys generally produce highly reliable estimates of age-specific prevalence.

A more recent innovation in calculating parameters of health expectancy, multistate life table methods, was developed in the 1970s. Multistate life table methods provide a more realistic approach to model population health status transitions (Schoen 1975; Schoen and Woodrow 1980). In terms of data, the “inputs” into the multistate life table model are incidence rates that describe movements between states (e.g., from healthy to unhealthy life). Preferably, age-specific life table transfer rates are used. These rates refer to functional status transitions within a given time interval. A major advantage of the multistate life table approach is that it permits recovery from health problems. In theory, there is no restriction on the number of functional status transitions that can be accommodated by the multistate life table (Schoen 1988). Thus, this approach provides estimates of the expected number of transitions over an individual’s lifetime and also provides a sense of health trajectories of individuals in the population. A drawback associated with the multistate approach is that it requires longitudinal data. Longitudinal surveys are available in a limited number of countries, primarily the United States, Canada, the U.K., France, Japan, the Netherlands and recently, China.

Another consideration of the multistate life table approach is that interviews in typically available longitudinal surveys are often separated by one or two years and sometimes as much as four to five years (e.g., the National Long Term Care Survey in the United States). Several studies have assumed that individuals experience only one transition within a given time period, for example, a one-year or two-year interval (e.g., Crimmins et al. 1994). To the degree that individuals experience multiple health transitions during a one-year, two-year, or longer interval between surveys, limiting the number of possible health status transitions that can occur during the time between survey waves underestimates the expected number of lifetime transitions. Researchers have developed several statistical approaches to address this limitation (e.g., Crimmins et al. 1994, 1996;

Hayward and Grady 1990; Laditka and Wolf 1998; Land et al. 1994).

The most recent statistical innovation to estimate incidence rates is to recover parameters of the embedded Markov process or chain. Land et al. (1994) estimated parameters (i.e., transition intensities) of a continuous time, discrete state Markov model of functional status using a panel regression model. The continuous time approach used by Land and his colleagues shares the advantages of other regression-based approaches (e.g., Hayward and Grady 1990), such as “smoothing” transition intensities and reducing sampling fluctuations. However, this approach assumes observations have a uniform time interval between successive measures of health status and limits the number of functional status states to two (such as nondisabled and disabled), in addition to death.

Laditka and Wolf (1998) introduced a discrete approximation that recovered the transition matrix of a Markov chain. The analytic strategy underlying this model of monthly functional status transitions is to identify the transition matrix of a Markov chain that most closely reproduces observed longitudinal data. Laditka and Wolf (1998) used a maximum likelihood approach that expresses the probability of an observed individual-level transition in terms of underlying model parameters, analogous to the continuous-time approach developed by Kalbfleisch and Lawless (1985). The model assumes that month-to-month transitions within the set of discrete states are described by a first-order Markov chain. The major methodological innovation in the approach used by Laditka and Wolf (1998) is that it allows for any pattern of unrecorded intervening functional status transitions, thereby permitting the relaxation of the assumption that no more than one transition occurred between interviews. This approach accommodates long-time intervals between recorded functional statuses, as well as intervals of varying length. Further, this approach imposes no theoretical upper limit on the number of absorbing states. The analytical strategy introduced by Laditka and Wolf (1998) has been used with panel data from the Longitudinal Study of Aging (Laditka and Laditka 2001, 2006; Laditka and Wolf 1998; Wolf et al. 2002) and the National Long-Term Care Survey (Laditka et al. 2007). Lièvre et al. (2003) developed software, the Interpolation of Markov Chains (IMaCh), which was designed to

replicate the estimation approach of Laditka and Wolf (1998). IMaCh has been used by a number of researchers (e.g., Jagger et al. 2003; Kaneda et al. 2005; Reynolds et al. 2005).

These recent advances using embedded Markov Chains also use microsimulation, which is a sampling approach (Laditka and Wolf 1998). The approach can be thought of as a random experiment for each individual in a population. Among those persons who become disabled, another set of random experiments is conducted to determine whether the individuals recover from disability, or die. The random experiments are governed primarily by the parameters of functional status transition recovered through the Markov model from the data representing actual individuals. The end result of these experiments is that each person in the simulated population has a simulated healthy life biography, approximating the distribution of lifetime outcomes for a given set of starting conditions. The model produces both expected (mean) values and estimates of variation around the expected values.

The Sullivan method and multistate life tables are both useful analytic approaches to estimate parameters of active life expectancy. Microsimulation offers the advantage of estimating complex models, obtaining results that can be obtained only with great difficulty by analytical means (Wolf 2001). Further, the approach can address a variety of missing-data problems. Microsimulation can also provide the entire frequency distribution of time individuals in a population spend in each health status. This feature may enable researchers and policymakers to better address issues of equity and efficiency in the financing and provision of health care and other services. Microsimulation also allows scholars to investigate the degree of uncertainty associated with estimates of healthy life expectancy. If policymakers use estimates of healthy life expectancy to quantify the value of future financial obligations for a large population (e.g., Lubitz et al. 2003), even small variations in values of key healthy life process parameters may result in differences of many millions of program dollars – or, in the case of programs as large as Medicare and Medicaid in the United States, many billions of program dollars. One source of variation is the Monte Carlo error. In practice, this source of variation appears to be relatively minor. Another is classical sampling error, as most microsimulation is based on survey data. More important may be uncertainty associated with estimated model parameters. A good discussion of these

and related issues in microsimulation is available in Wolf (2001). Monte Carlo variation and the uncertainty associated with statistically estimated parameters can be estimated simultaneously through sample reuse methods, such as the bootstrap (Cohen 1991), thus providing standard errors for the estimates from microsimulation.

Active Life Expectancy Approaches and Differences among Important Subgroups

Women Live Longer but Experience More Disability

Almost all studies have found that life expectancy is notably longer for women than for men but that women spend a greater proportion of their longer lives with substantial disability (Robine et al. 1997). This has been the finding of many studies conducted using data from the United States (e.g., Branch et al. 1991; Crimmins et al. 1996; Laditka and Wolf 1998; Manton et al. 1993; Reynolds et al. 2005). This is also the case for women in relatively homogeneous European countries such as France, the Netherlands, England and Wales (Robine et al. 2002; Robine and Ritchie 1991), in selected European countries (Grundy 2006), in Italy (Minicuci and Noale 2005), Canada (Bélanger et al. 2002) and in Japan (Sauvaget et al. 1999; Tsuji et al. 2002). Recent findings highlight similar gender differences in developing countries such as Mexico (Reyes-Beaman et al. 2005), Thailand (Jitapnkul et al. 2003), China (Kaneda et al. 2005) and in developing countries throughout the world (Mathers et al. 2002). These gender differences are attributed to a number of causes. Women have more favorable survival histories than men at all ages; thus, women's advantage at later ages continues trends of earlier life stages (Deeg 2001). Women are more likely than men to experience a decline in functional status and are less likely to recover (Becket et al. 1996). Most studies conclude that the somewhat higher incidence of disability among women *at all ages* accounts for substantial gender differences in disability prevalence at older ages (Leveille et al. 2000; Murtagh and Hubert 2004). Women may simply accumulate more disability throughout their lives. Three recent studies high-

light the role of socioeconomic status and other cultural factors as contributors to active life expectancy for women. Grundy (2006) found that women in the U.K. are more likely to be widowed and to live alone; however they may also have stronger social supports. Research in China suggests that older women are at a substantial economic disadvantage compared with men (Kaneda et al. 2005; Yi et al. 2006).

Active Life Expectancy Differs Substantially among Racial and Ethnic Groups

Most studies of racial differences in active life expectancy have focused on the United States, usually comparing active life expectancies of African Americans and whites. These comparisons invariably report that death rates are higher for African Americans than for whites at younger ages. In some studies, curves plotting life expectancy for African Americans and whites cross at older ages (80 and over), so that death rates for whites exceed those for African Americans at older ages. Some researchers argue that the crossover is due to inaccurate age reporting. In several studies that have corrected for age misstatement, the crossover disappeared (Elo and Preston 1997; Preston et al. 1996). Manton and Stallard (1997), however, found a crossover even after correcting for age misstatement. They found that, among those having reached old age, African Americans live longer, more disabled lives than whites.

Consistent with gender differences for whites, researchers generally find that African American women live substantially longer than African American men. In a study that corrected for age misstatement and examined longevity trends from the late 1930s until 1990, Elo (2001) found life expectancy gains of almost 20 years for African American women and 14 years for African American men. During the latter half of the twentieth century, Elo found, African American women had notably larger gains in life expectancy than African American men.

There is also evidence of morbidity differences between African Americans and whites. Most researchers have found that white women have both total and active life expectancies that are longer than those of African American women. The analogous relationship

applies to white men and African American men. However, African American women have a longer life expectancy than white men but a lower expectancy for active life (Crimmins et al. 1996; Geronimus et al. 2001; Hayward and Heron 1999). Researchers agree that African American women live a notably greater percentage of their lives with disability than African American men (e.g., Crimmins et al. 1996; Crimmins and Saito 2001; Geronimus et al. 2001; Hayward and Heron 1999; Laditka and Laditka 2006).

A small number of studies have examined life expectancy and disability patterns for other racial and ethnic groups. These studies have found that African Americans and American Indians live notably shorter and more disabled lives than whites, Asian Americans, or Hispanics (Hayward and Heron 1999; Waidmann and Liu 2000). Researchers emphasize disparate distributions of advantages and disadvantages over the life span and socioeconomic and cultural factors as likely causes of racial and ethnic disparities in mortality and morbidity (Blackwell et al. 2001; Hayward et al. 2000; Schoeni et al. 2005).

Disparities Associated with Socioeconomic Status and Educational Attainment

Researchers calculating active life expectancy have often used two broad measures to capture differences in socioeconomic status, income and education. For the measure of income, reviewing studies using data from Canada, the Netherlands, Finland and Belgium, Bone, Bebbington, and Nicolaas (1998) and Robine and Ritchie (1991) concluded that more affluent people live substantially longer and healthier lives than the less affluent. When both income and education are included in the research design, women and men living in Belgium, Canada, Finland, the Netherlands and Sweden who are poorer and have less education live shorter, more disabled lives than those who are more affluent and have more education (Robine et al. 1997). Using data from France, Cambois (2006) found that occupational status and occupational mobility is associated with mortality for women and men. In the U.K., Matthews et al. (2006) concluded that women and men with more income live longer without disability than those with less income. The effects were greater

for men than for women. For women, greater income was associated with morbidity compression (Matthews et al. 2006). In general, income differences in life expectancy and active life expectancy are greater than gender differences. Marked socioeconomic status differences exist in China and these socioeconomic disparities are more pronounced for women than for men (Kaneda et al. 2005).

Education has a similar relationship to health. It seems clear, at least from studies using United States' data, that older women and men with more education live longer, healthier lives than people with less education (Crimmins et al. 1996; Crimmins and Saito 2001; Freedman and Martin 1999; Guralnik et al. 1993; Laditka and Laditka 2001, 2006; Laditka et al. 2007; Laditka and Wolf 1998; Land et al. 1994). Using data from Fiji, Panapasa (2002) also found that education was positively associated with longer, healthier lives for women and men.

Although those general conclusions about education seem clear, the mechanisms that link education and functional status in older people are complex. A number of indirect pathways may be involved. Our discussion draws on that of Freedman and Martin (1999) and is grounded in the Institute of Medicine's disablement model, described by Pope and Tarlov (1991) and in a review provided by Preston and Taubman (1994). In the first pathway, education operates through direct causes of disability, injury and disease, together with other demographic, socioeconomic and cultural factors. For example, people with more education are able to draw on more resources and thus are better able to access health care over their life course (Sabates and Feinstein 2006). More education is also often associated with a greater time horizon for decision making: people with more education live longer than those with less education and may have a greater incentive to avoid risky behaviors such as smoking (Hammond 2003). In a second pathway, education may influence more distal pathways such as medical treatment and behavioral risk factors. People with more education may be better able to successfully navigate the health care system. For example, individuals enrolled in managed care may need to make their way through a maze of requirements to obtain specialty services. More education may be associated with greater knowledge about the importance of healthy behaviors. Education may alter an individual's ability to understand risks to health, or the propensity to accept or reduce known risks (Fries

2002). For example, not smoking and taking certain vitamin supplements, may protect against macular degeneration and cataracts, thereby reducing visual impairment at older ages (e.g., Christen et al. 1996). More education is associated with higher levels of physical activity, better diet and weight control. These health behaviors are linked to reduced levels of some chronic conditions affecting functional ability, such as arthritis and osteoporosis (Wister 1996) and both cognitive decline and dementia (Kramer et al. 2006). Some studies have shown that women with less education have notably more behavioral and biological risks associated with coronary artery disease. For example, women with less education are more likely to smoke, exercise less and have lower high density lipoprotein levels than women with more education (Matthews et al. 1989). Both women and men with more education are less likely to smoke or to be overweight and more likely to drink moderately (Ross and Wu 1995). The third pathway suggests that people with more education may be better able to use assistive devices and obtain services needed for long-term care.

Morbidity and Mortality may Differ among Regions and Rural-Urban Settings

Findings for health status differences by location of residence are complex. Several studies have provided striking evidence that women and men living in the southeastern United States have substantially higher disability rates than those in other parts of the United States (Lin 2000; Porell and Miltades 2002). Lin (2000) attributed the greater prevalence of disability to people living in the southeast to higher incidence of stroke and diabetes. Porell and Miltades (2002) concluded that controlling for health status and economic factors diminished regional differences in disability but did not eliminate them. These researchers also suggest that exposing individuals to risk factors early in life may predispose them to disability later in life. Research has yielded evidence to support this theory (Hayward and Gorman 2004).

There is little research comparing active life expectancy among rural and urban residents. In the United States, researchers have found that more poverty in rural areas than in urban areas results in higher levels

of morbidity for rural residents (Auchincloss and Hadden 2002; Auchincloss et al. 2001; Wen et al. 2003). Geronimus et al. (2001) calculated active life expectancy estimates for African American and white females and males using 1990 data from a diverse set of 23 local areas in the United States, distinguished by high (or low) poverty rates. At age 16, people living in rural areas lived longer, more impaired lives than those in urban areas. Using an embedded Markov process and data from the U.S. National Long-Term Care Survey, Laditka et al. (2007) calculated active life expectancy for rural and urban residents who were impaired at the time of a baseline measurement, for 16 subgroups defined by rural/urban residence, gender, race and education. Controlling for educational attainment, Laditka et al. (2007) found that rural residents lived notably longer lives than urban residents, with more impairment. Summarizing the results of several studies in Canada, Bebbington and Bajekal (2003) reported that people in more rural areas have lower estimates of active life than those in more urban areas; however, these studies estimated results for males and females combined and do not appear to control for socioeconomic status. Several other studies have found that variations in life expectancy are associated with area availability of health resources and socioeconomic measures (Fukuda et al. 2005; Gutierrez-Fisac et al. 2000). In a recent study using data from six regions (four urban and two rural) in the U.K., Matthews et al. (2006) found notable variation in active life expectancy across the regions, with mixed rural and urban findings for both total life expectancy and healthy life expectancy. In general, most of these studies concluded that there is a higher burden of disability in rural areas than in urban areas, suggesting that needs for services may be greater in rural areas. These studies also highlight the public health benefits of targeting services to areas with greater levels of disability.

Differential Active Life Expectancy Using Other Measures of Health Status

Researchers highlight the importance of incorporating multiple dimensions of health in studies examining life expectancy and active life expectancy, such as

disability trends, physical functioning, trends in disease prevalence, trends in risk factors and self reported health (Crimmins 1996, 2004). Many studies have used one or both of two standard measures to represent functional status: Activities of Daily Living (ADLs), such as eating, dressing and bathing; and Instrumental Activities of Daily Living (IADLs), such as marketing and preparing meals (Branch et al. 1991; Crimmins et al. 1994, 1996; Laditka and Wolf 1998; Manton et al. 1993; Manton and Gu 2001).

Onset of impairment in ADLs and IADLs, as well as recovery from those impairments, may be strongly influenced by social roles and the built environment (Balfour and Kaplan 2002; Clarke and George 2005). Social roles and environment may also affect the way individuals judge whether they are impaired, or how they report impairments. An individual may be less likely to report disability if she can compensate for an impairment with assistive devices, or by upgrading her home to aid functioning. A woman (or man) who might otherwise be disabled in bathing by some measures, for example, might regain her (or his) ability to perform this activity with a walk-in shower or tub. Changes in functioning found by recent research could reflect changes in individuals' expectations of disability and use of equipment, rather than changes in their underlying physiological functioning (Cornman et al. 2005; Crimmins 1996; Freedman et al. 2005; Freedman and Martin 1998). An increasing number of studies have used measures such as seeing, lifting, carrying, climbing stairs and walking, instead of ADL and/or IADL scales, or in addition to them, to capture more information about underlying physiological functioning (Freedman and Martin 1998, 1999, 2000; Jagger et al. 1998; Leveille et al. 2000; Waidemann and Liu 2000).

Three recent studies investigate the effects of obesity on estimates of active life. Using longitudinal data from the U.S. and an embedded Markov modeling approach, Reynolds et al. (2005) examined the effect of obesity on active life expectancy. These researchers found little difference in total life expectancy between those who were obese and those who were not. However, those who were obese lived a larger proportion of their lives with substantial disability. Given the fact that obesity is associated with a notably higher risk of diabetes and vascular disease, the prevalence of disability is likely to increase if there is an increase

in the prevalence of obesity among older people. Providing a different perspective on the effects of obesity on active life expectancy in the U.S., Olshansky et al. (2005) calculated the reduction in mortality rates if obesity was eliminated – that is, if every individual in the U.S. had normal weight – and re-estimated life expectancy in the U.S. with that assumption. Olshansky et al. estimated that if current trends of increasing obesity prevalence persist, this will reduce life expectancy by one third to three fourths of a year – as much as half of the magnitude of the gain in life expectancy in the decade from 1980 to 1990. These researchers concluded that the epidemic of obesity will result in less healthy lives, as well as shorter lives and higher health care costs. Using data from The Netherlands, van Baal et al. (2006) calculated healthy life expectancy for smokers and nonsmokers of normal weight and for obese non smokers. They found that healthy life expectancy was greatest for non smokers of normal weight. Obese smokers had the shortest period of healthy life, followed by obese non-smokers.

Two recent studies provide a new perspective on ADL disability by reporting the full distribution of remaining total, active and inactive years for women sharing a set of important characteristics (Laditka and Laditka 2006; Wolf et al. 2002). These researchers found that years of total, active and inactive life are broadly distributed within each of several subgroups. Further, they found that the shapes of these distributions vary considerably across groups, highlighting the heterogeneity of disability in older populations. The study by Wolf et al. (2002) investigated distributions for subgroups of women distinguished by marital status, race and education. Laditka and Laditka (2006) examined distributions for subgroups of women and men with more (or less) education, distinguishing between those with (or without) diabetes at age 70. We provide several histograms to illustrate the results Laditka and Laditka (2006) obtained, in the section "Effects of Diabetes on Active Life Expectancy," below.

Recently, sensory and cognitive impairments have been added to the set of functional status measures included in definitions of active and impaired life. Jagger et al. (1998) found that women live a greater proportion of life with impaired vision than men. Jagger et al. (2005) found that, after controlling for sociodemographic and health factors, people who had both

vision and hearing difficulties were at twice the risk of an activity limitation. Vision impairment is a particularly interesting indicator of functional status when the research focus is on changing disability patterns. Treatments for vision impairments have improved markedly in recent years, as exemplified by treatments for cataracts and diabetic retinopathy (Desai et al. 2001). These improvements are likely to have substantial positive effects on the ability of older people to live independently. Jagger and Matthews (2002) included cognitive status as a disability measure and found that the average woman lives a substantially larger proportion of remaining life with cognitive impairment than does the average man. Cognitive decline is of increasing interest, because extended longevity has been accompanied by predictions of more dementia, especially for women (e.g., Brookmeyer et al. 1998). It is also of increasing interest because there is now considerable evidence that the risks of dementia and cognitive decline may be notably reduced through healthy lifestyles, particularly physical activity (Hendrie et al. 2006).

In another area, studies have also examined self-reported health status as a predictor of active life expectancy, often in conjunction with other health indicators (Matthews et al. 2006; Spiers et al. 1996). However, there is evidence of gender differences in the ways that women and men evaluate and report their own health status. For example, Helmer et al. (1999) found that self-reported health was more closely associated with medical conditions and disability for women than for men. Thus, the predictive power of subjective health reports from women and men may differ.

Several recent studies have examined the dynamics of recovery. Deeg (2005) used longitudinal data from the Netherlands and cluster analysis to examine effects of various chronic conditions on the probability of recovery. Deeg identified eight different course types, e.g., stable mild, stable severe and died. Cancer was predictive of death, whereas arthritis was primarily predictive of course types other than “died” (Deeg 2005). Peres et al. (2005) used longitudinal data from France and a Markov modeling process to examine progression of disability and recovery due to various types of disability. Stroke, diabetes, cardiovascular disease, low levels of cognition, lung disease and impaired vision were associated with either no recovery or disease progression.

We are aware of only one study that has examined associations between health status and health expenditures over the older life course, specifically in the context of active life expectancy. Lubitz et al. (2003) examined the relationship between health status at age 70, life expectancy and remaining lifetime cumulative health care expenditures using data from the 1992–1998 Medicare Current Beneficiary Survey. They found that, compared with those in worse health, those in better health at age 70 had longer life expectancy and similar lifetime cumulative health care expenditures. A 70 year old in better health could expect to live another 14.3 years and had health expenditures of \$136,000; the analogous results for a 70 year old with impairments in one ADL were 11.6 years and \$145,000. Results were similar for other health status measures, such as IADLs and Nagi measures of physical functioning. This study examined only Medicare data; the addition of Medicaid expenditures for long-term care might alter these findings.

Disease Specific ALE Research

Disease-specific effects on active life expectancy have also been examined. Cause-specific calculations have been made using data from Australia, Canada, the Netherlands, the United Kingdom and the United States (e.g., Bélanger et al. 2002; Cutler et al. 2006; Hayward et al. 1998; Laditka and Laditka, 2006; Robine et al. 1997). Bone et al. (1998) reviewed studies from Australia, Britain and the Netherlands. They focused on three major disease categories: cancer, circulatory diseases and musculoskeletal conditions. Eliminating circulatory diseases extended life more than other interventions but chronic nonfatal diseases, such as musculoskeletal conditions, had almost no effect on life expectancy. However, this brought the largest gain in active life (Bone et al. 1998). Hayward et al. (1998) estimated models in which several major causes of death were separately eliminated for women and men, using data from the United States. They found substantial gender differences in disease-specific effects. For both women and men, eliminating heart disease brought the greatest life expectancy gains. For men, additional years from eliminating heart disease were primarily active; for women, they were inactive.

Cutler et al. (2006) investigated the role of improved medical care in outcomes for people with cardiovascular disease and how changes in care have influenced health status over time. Their results show that hospitalization for cardiovascular disease stayed fairly constant between 1984 and 1999. However, during this period, survival improved and disability declined. Appropriate therapies explained up to 50 per cent of the reduction in disability and 70 per cent of the reduction in death. Therapies include beta-blockers, ace-inhibitors, invasive procedures and aspirin. Older people in areas with a high use of appropriate procedures had better outcomes than those in low use areas. They estimated that disability reductions for cardiovascular disease added up to 3.7 years of quality-adjusted life expectancy.

Effects of Diabetes on Active Life Expectancy

We spotlight four recent studies that examined effects of diabetes on active life expectancy because diabetes is such a serious chronic disease with growing incidence and prevalence in many developed and developing countries (King et al. 1998). Diabetes notably reduces life expectancy (Gu et al. 1998). Health care use and its costs are substantially higher for those with diabetes than for those without the disease (Laditka et al. 2001; Olsson et al. 1994). With data from Canada, Bélanger et al. (2002) used multi-state life table methods to examine effects of several chronic diseases and other risk factors on active life expectancy for women and men ages 45 and older. Risk factors included education, income, smoking, body mass index, physical inactivity, arthritis, diabetes and cancer. Diabetes was the greatest threat to health and longevity, reducing life expectancy for women even more than cancer or smoking, two other factors with large impacts on mortality. Bélanger et al. suggested that this effect may in part result from associations between diabetes and heart disease. The impact of diabetes on life expectancy was less for men, although still substantial. For men, only cancer, smoking and low education were greater risks for shortened life. Diabetes also reduced years without disability – almost 15 fewer active years for women, 11.5 for men. Among women, only 33 per cent of remaining life was without disability; for men, this measure was only 41 per cent. By comparison, women

without diabetes lived 59.9 per cent of remaining life without disability; for men, this measure was 67.5 per cent. For both women and men, the impact of diabetes on the proportion of life without disability was greater than the impact of any other disease or lifestyle factor.

Crimmins et al. (2002) provide another perspective on disease-specific effects, showing how disease factors combine to yield healthy and diseased life expectancy. Using the Sullivan method, Crimmins et al. found that, beginning at birth, the expected number of years lived with diabetes is 3.4 for women, 2.7 for men. The expected number of years lived with diabetes beginning at age 65 is 2.1 for women, 1.7 for men. These are averages across entire populations; the number of years lived with diabetes for those who incur the disease are many more than these population averages. These averages nonetheless illustrate the large population impact of diabetes.

Using longitudinal data from one region of the U.K., Jagger and her colleagues (2003) estimated active life expectancy for older people with and without diabetes. Those with diabetes lived shorter and more impaired lives. The effect of diabetes on the percentage of life lived without substantial disability increased at older ages. For example, at age 65, people without diabetes lived 16.5 additional years, 82.6 per cent of which were active. The analogous figures for those with diabetes were 11.8 and 83.2 per cent. At age 80, people without diabetes lived 7.8 more years, 57.1 per cent of which were active. The analogous figures for those with diabetes were 5.5 and 50.5 per cent.

Applying the embedded Markov chain approach and microsimulation to a nationally representative survey of older Americans Laditka and Laditka (2006) found that life expectancy was substantially lower with diabetes for both African American and white women and men, regardless of educational attainment. White men with more education without diabetes, for example, lived about 36 per cent longer than comparable men with diabetes. For all groups, those with diabetes were disabled for a strikingly larger proportion of life than those without the disease. For example, among white women with more education, those with diabetes spent almost 40 per cent more of their older lives with a disability.

Our investigation of between- and within-group variability, using information about the full distributions of total, active and inactive life (Figs. 24.1 and

24.2), reinforces the heavy health burden of diabetes. As illustrated in Figs. 24.1 and 24.2, histograms for remaining years of life and remaining years of unimpaired life were markedly more skewed for those with the disease than for those without it. In addition, our results show that, even within populations characterized by a major chronic disease, there is a great deal of variability around standard summary measures of health expectancy.

Figures 24.1 and 24.2 show results that have not been presented previously, based on data from the Longitudinal Study of Aging. Laditka and Laditka (2006) provided details about the data and methods. Figures 24.1 and 24.2 illustrate the health expectancies of African American women and men, respec-

tively, having less than high school education. The average total life expectancy at age 70 for women in this group without diabetes was 12.2 years (Standard Deviation, SD, 7.0). The comparable expectancy for men was 9.8 years (SD 6.5). Among those with diabetes, the corresponding expectancies were 8.9 (5.7) and 7.3 (5.2). The figures show notable distributions around these averages. For women and men, the middle panels of Figs. 24.1 and 24.2 show that those with diabetes were much more likely to live only a few years without disability. For example, the percentages of both women and men who had no full years without disability beginning at age 70 were nearly double for those with diabetes, compared to those without the disease. Among women, those

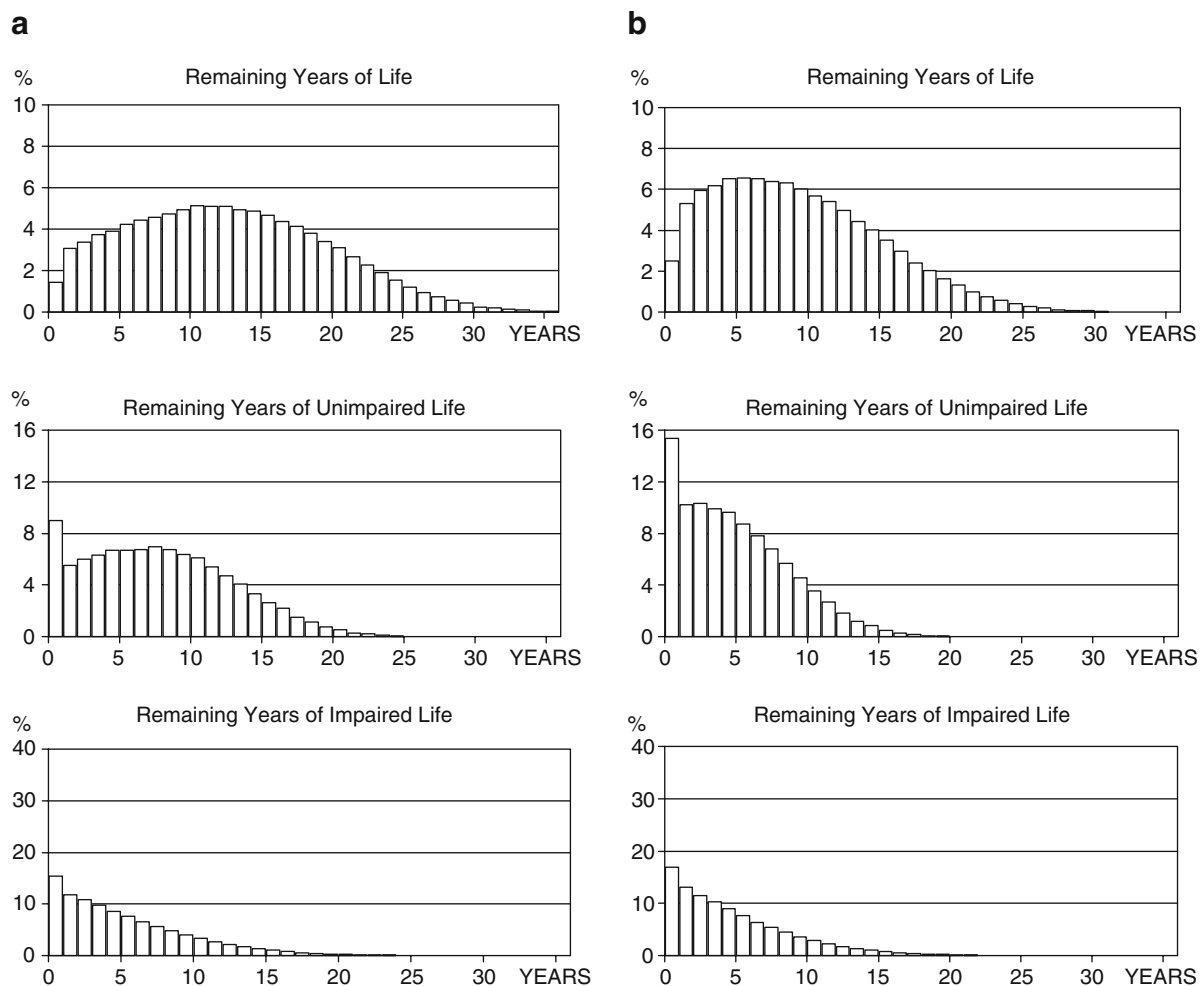


Fig. 24.1 (a) Remaining years of unimpaired, impaired, and total life. African American women, low education, without diabetes at Age 70

(b) Remaining years of unimpaired, impaired, and total life. African American women, low education, with diabetes at Age 70

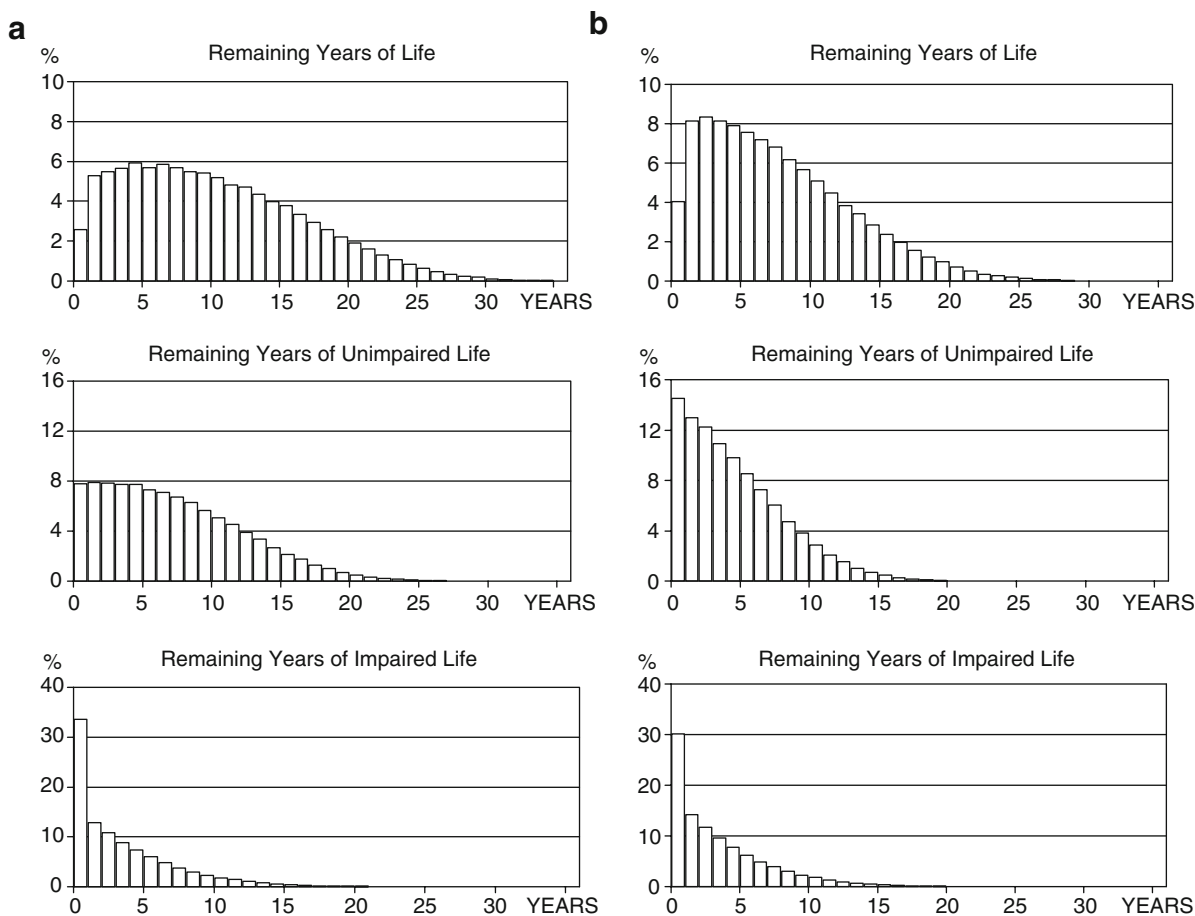


Fig. 24.2 (a) Remaining years of unimpaired, impaired, and total life. African American men, low education, without diabetes at Age 70

(b) Remaining years of unimpaired, impaired, and total life. African American men, low education, with diabetes at Age 70

without diabetes lived 39.9 per cent of remaining years at age 70 with disability. Comparable women *with* diabetes, lived 49.2 per cent of remaining life at age 70 with disability. Analogous differences for African American men are comparable.

Evaluating the Future Health of Older Populations

An early and continuing motivation for studying active life expectancy has been the investigation of competing theories about trends of population health. This investigation is important, because these theories imply notably different trajectories of population health – and, potentially, dramatically different future costs for health

care and long-term care. Two issues especially sparked this investigation in the late 1980s: the rapidly falling mortality rates in developing countries and the need for policies to deal with the anticipated population health care demands of the large wave of aging baby boomers. James Fries (1980) made a particularly important early contribution to this discussion, with his theory of the compression of morbidity. Fries proposed that the onset of illness and disability could be postponed to a brief period at the end of life. A more pessimistic view of population health, the expansion of morbidity, suggested that longer lives will be accompanied by more chronic disease and disability (Gruenberg 1977; Kramer 1983). A third view, often referred to as dynamic equilibrium (Manton 1982), assumes that the prevalence of chronic disease will increase as mortality rates fall. At the same time, the rate at which chronic diseases

progress will slow. The dynamic equilibrium theory suggests that more people will be disabled and that they will be disabled through more years. However, through many of this increased number of years, they will experience less intense forms of disability. The active life expectancy indicator is well suited to examine the evidence for these three theories of population health.

Expansion of Morbidity? Compression of Morbidity?

Data from the 1960s and 1970s suggested that older Americans were living longer in these decades but in poorer health (Colvez and Blanchet 1981; Crimmins et al. 1989; Verbrugge 1984). Most studies representing the early 1980s to the late 1990s indicate improving health. Manton and colleagues, for example, found decreasing disability from the early 1980s to the late 1980s (Manton et al. 1993). Another study found evidence of both greater life expectancy and small gains in active life expectancy (Crimmins et al. 1997). However, some researchers found no clear disability trends (Crimmins et al. 1997). Reviewing evidence from the 1982 to 1989 NLTCs and 1984–1990 Longitudinal Study of Aging, Freedman and Soldo (1994) concluded that the incidence of disability in ADLs might be declining and also that the prevalence of IADL disability might be declining.

Studies using more recent data have also found significant disability declines. Using data from 1982 to 1994, Manton et al. (1997) found a 1.1 per cent annual decline in the proportion of people who were chronically disabled. Using different functional status measures, Freedman and Martin (1998) analyzed data from 1983 and 1994, also finding significant limitation reductions. These reductions amounted to 0.9–2.3 per cent annually, depending on the measure of functional status examined. The biggest limitation reductions were among people age 80 or over, suggesting the plasticity of age-related diseases even at older ages. Using data from 1983 to 1993 and four measures of functional ability (seeing, lifting and carrying, climbing stairs and walking a quarter mile), Freedman and Martin (1999) found significant declines in all measures of functional limitation. They also found that greater educational attainment for the cohort reaching older ages during this period accounted for the largest share of the improvement. Waidmann and

Liu (2000) used Medicare Current Beneficiary Survey data from 1992 to 1996, finding that the largest decreases were in IADL disability – reductions of 2.3 per cent per year. Studying trends from 1978 through 1998 for the Austrian population, Doblhammer and Kytir (2001) found the proportion of life lived in good health increased throughout the period for women and men and that mortality rates declined throughout the period. Examining trends in several U.S. studies, Schoeni et al. (2001) concluded that improvements in health were concentrated in the 1982–1986 period and more modest declines were evident from 1992 through 1996. Decreases in disability during these periods occurred for women and men and were concentrated in individuals with higher education (Schoeni et al. 2001). Using data from the NLTCs that included surveys from 1982 through 1999, Manton and Gu (2001) reached a different conclusion. They found that the prevalence of chronic disability fell faster in the 1990s than the 1980s; the standardized annual rate of declining disability prevalence was 0.26 per cent from 1982 to 1989, 0.38 per cent from 1989 to 1994 and 0.56 per cent from 1994 to 1999 (Manton and Gu 2001). These researchers also found that African Americans experienced a larger percentage decline in disability prevalence than nonblacks (Manton and Gu 2001). Collectively, these studies offer support for the compression of morbidity theory, suggesting that the older population was healthier in the 1980s and 1990s than it was in the 1960s and 1970s.

Growing Evidence for Dynamic Equilibrium

A number of recent studies, reviews and meta-analyses support the dynamic equilibrium theory. For example, Robine, Mormiche and Sermet (1998) examined trends in disability in France, using data from 1981 and 1991. They found a notable decrease in the prevalence of disability among middle aged and older people. However, they also found that the prevalence of thirteen major chronic diseases, such as heart disease and cancer, increased during this period. They suggest that the most frequent chronic diseases, cardiovascular disease and arthritis, appear to be less disabling in 1991 than in 1981. Using data from 1984 and 1994 in the United States Freedman and Martin (2000) studied trends in chronic disease and functioning for both the upper and

lower body. Lower body limitations declined significantly, about 1.4 per cent annually. Accumulating over a period of years, reductions of this magnitude would represent a notable improvement in population health. On the other hand, reports of chronic diseases and injuries increased in the Freedman and Martin study – with the exception of hypertension. This finding was balanced by a related observation, also noted by Robine et al. (1998), that several major diseases, particularly arthritis, appeared to be less debilitating for more recent cohorts. These results support the dynamic equilibrium theory. However, as these researchers note, such results could be artifacts of earlier disease detection, rather than a true change in population health.

Using data from the U.K., Spiers et al. (1996) compared trends in both functional status, measured by ADLs and self-reported health, using data from 1981 and 1988. They found that significantly fewer people were dependent in at least one ADL in 1988 but also that those in 1988 were less likely to report good health. Such findings underscore the multidimensional nature of population health. For the full picture, we need to look at a range of measures of disability and health. It may also be the case, as Spiers et al. (1996) emphasized, that perceptions about health status are to some extent influenced by what is perceived to be “normal” in a given social context, or by expectations about the horizon of possibilities for active living at older ages. Thus, the findings of Spiers et al. (1996) may be an artifact of differing implicit measurement scales – people in different periods may simply have interpreted questions asking about disability or health status differently. For example, if baby boomers expect to be more active in older age than their parents were, they may also be more likely to report being disabled – reflecting their use of a lower threshold of impairment than their parents might have used.

With data from the 1982–2002 National Health Interview Surveys (NHIS) in the U.S., Schoeni and his colleagues (2005) compared changes in the prevalence of ADL and IADL disability among groups distinguished by various levels of education, income and race and ethnicity. The prevalence of disability decreased substantially, from 22.7 to 15.5 per cent. Most of the decline was attributed to less IADL disability. Significant decreases in IADL and ADL disability persisted after controlling for gender, age and other factors; again, the declines were more pronounced for IADL disability. The prevalence of disability was greater

among minorities. However, there were no significant differences in *changes* in disability prevalence among groups defined by race and ethnicity. Adjusted declines in the prevalence of disability were greater for those with more education and income. Thus, these researchers conclude that socioeconomic disparities in disability increased over the past 20 years.

Recently, researchers have used biological markers to study trends in population health. They suggest that these measures of allostatic load may be more objective health measures for evaluating population health trends (Crimmins et al. 2005; Crimmins et al. 2003). Crimmins and her colleagues (2005), for example, used biological markers to examine changes in mortality and morbidity in the 1990s. With data from the U.S. National Health and Nutrition Examination Surveys (NHANES) III (1988–1994) and IV (1999–2000), they examined changes in prevalence of 10 biological markers. Markers include blood pressure, cholesterol levels, glycosylated hemoglobin, body mass index, c-reactive protein and homocysteine levels. The findings were mixed: there was a decline in high lipid levels and homocysteine, which Crimmins et al. attributed to greater use of medications aimed at lowering lipid levels and to folate supplements. There was an increase in blood pressure despite greater use of antihypertensive medication. BMI levels also increased significantly. Crimmins et al. (2005) concluded that greater increases in the prevalence of high risk conditions would have occurred had it not been for increasing use of pharmacological interventions.

Two recent meta-analyses of trends in active life expectancy in the U.S. support the dynamic equilibrium theory. Freedman and colleagues (2002) assessed the quality and consistency of evidence on disability prevalence. They conducted an extensive review of the empirical literature on trends in active life expectancy. They concluded that there is evidence of consistency in declines in any disability in a range from 0.92 per cent to 1.55 per cent per year and a decrease of between 0.4 per cent and 2.74 per cent per year in IADL disability. Studies showed mixed results for trends specifically for ADL disability, ranging from an increase of 1.53 per cent to a decrease of 1.38 per cent per year. In another recent review, Freedman and her colleagues (2004) reported the results of a working group that reviewed trends in disability in the U.S. using empirical findings from five longitudinal surveys: the Health and Retirement Study, the Medicare Current Beneficiary Survey, the National Health Interview Survey, the National Long Term Care

Survey and the Supplement on Aging. In evaluating the trends for ADL disability, Freedman and colleagues concluded that, among older people living in the community, there was a decline in the prevalence of disability and obtaining help, beginning in the mid 1990s. They found reductions of 1–2.5 per cent per year in the proportion of the older population residing in the community who reported ADL difficulty. However, the proportion of the population with ADL limitations who received help in performing ADLs over the past two decades remained flat. Including older people residing in institutions did not meaningfully change the results. Estimates of use of self care equipment varied widely across the surveys. As Freedman and her colleagues noted, this variation may be due to differences in the wording of survey questions. They found increases in the proportion of the population who used personal care equipment. However, there was a reduction of 2 per cent to 4 per cent per year in the proportion receiving help with bathing. The results were much more mixed for walking without help.

In a third recent review article, Crimmins (2004) summarized evidence of changes in population health in several major categories: disability, physical functioning, disease prevalence and incidence, risk factors, self reported health and active life expectancy. Crimmins concluded that IADL disability has decreased and suggested this may be due to assistance received in the home. The evidence is more mixed for ADL disability. Crimmins' review found that most analyses report increasing disease prevalence in recent decades. The increase is due to survival with previously fatal diseases; individuals have lived longer, acquiring more conditions. Crimmins concluded that people have more diseases but less disability than in the past. Regarding trends in risk factors, people are much more likely to be obese now than in the past. However, older people are much less likely to smoke. Regarding self reported health, there were no notable gains in reports of excellent or very good health, although there has been a decline in reports of fair or poor health. As for active life expectancy, Crimmins concluded that people are living longer with fewer disabilities and less functional loss. She concluded that most studies from 1980 to the present have found generally increasing health in older populations.

Several recent studies provide evidence of the growing role of assistive devices in meeting the needs of older people. Assistive devices are also referred to as special equipment, aids, or assistive technology. For example, in

a randomized control trial, Mann, et al. (1999) provided evidence that assistive technology can postpone personal care dependence among older individuals. Using data from the 1992–2001 Medicare Current Beneficiary Survey (MCBS), Freedman and her colleagues (2005) examined trends in ADL difficulty and in assistance with self care activities. After adjusting for age, self reports of ADL disability decreased, from 30 per cent in 1992 to 26 per cent in 2001, an average annual decrease of 2.1 per cent. Among people who reported ADL impairment, use of assistive technology without help from other persons increased to 32 per cent in 2001, up from 26 per cent in 1992. Freedman et al. (2005) concluded that assistive technology appears to be particularly important in reducing dependence on personal care for walking. They point out that their study did not include many types of assistive technology or household technology; thus, the estimates of use of assistive devices are likely to underestimate the role of assistive technology. Freedman and her colleagues concluded that assistive technology is an important factor in recent declines in use of personal care; however, the most important factor is a reduction of underlying disability.

Cornman et al. (2005) compared the measurement of assistive technology among six national surveys of older people conducted in the U.S. and investigated how various approaches may influence the measured use of assistive devices. Estimates of those using any type of assistive device ranged from 14 per cent to 18 per cent and were reasonably similar across surveys. They found that restricting the question about use of assistive devices to older people who reported difficulty performing daily activities omitted those who used devices but did not report difficulty. When people in this group were included, the measured use of assistive devices increased notably, as did the prevalence of disability. These researchers conclude that future surveys should include questions about assistive device use that are independent of difficulty and also people who report no difficulty with daily activities but who use assistive devices.

Discussion and Implications for Practice, Policy and Future Research

Our review of the active life expectancy literature suggests several important policy implications. Socioeconomic factors, particularly education and income, are

significantly associated with expectancies for longevity and active life. Results from several recent studies suggest that older women and men with less education and income have not experienced the same gains in life expectancy and active life as have those with more education and income. These disparities are more pronounced for minorities and for people in developing countries, particularly older women. Given the growing evidence supporting the dynamic equilibrium theory, many researchers familiar with these issues agree that more public resources should be devoted to preventing or delaying the onset of disabling diseases (e.g. Crimmins 2004; Crimmins et al. 1997; Fries 2002; Laditka and Laditka 2000, 2001; Olshansky et al. 2005; Preston 2005).

Implications for Policy

Evidence clearly links many kinds of disability to lifestyles. For example, a review of an extensive number of studies has identified risk factors such as smoking, physical inactivity, obesity, hypertension, saturated fat intake, alcohol intake, low fiber intake and occupational and environmental toxins that are strongly associated with chronic diseases (Fries 1988). There is strong evidence that effective interventions are now available for a number of these factors, with strong circumstantial evidence for others. There is now also considerable evidence that the risks of Alzheimer's disease, vascular dementia and cognitive decline generally, may be notably associated with physical activity, nutrition and social involvement, as well as generally with vascular health (Hendrie et al. 2006). Brain health is also a central measure of population health and active life expectancy, although heretofore most active life expectancy research has focused on physical disabilities. However, an emerging paradigm suggests the advisability of public health programs designed to promote brain health (Albert et al. 2007), so the inclusion of brain health measures in active life expectancy research is likely to expand.

It would be useful if policymakers and populations could be educated to understand the plasticity of aging – that trajectories of health and disability are often modifiable through relatively inexpensive early interventions. Studies have provided strong evidence of the plasticity of aging. Women and men with lower

risk – non-smokers who maintain healthy weight and exercise – become disabled later in life than those with higher risk (e.g., Reed et al. 1998; Vita et al. 1998). They also have less cumulative disability and lower levels of disability at any given age, than persons with more health risks. Several researchers emphasize that behavioral changes are needed if we are to stem the tide of obesity and its effects on shortening life expectancy and increasing chronic diseases (e.g., Olshansky et al. 2005; Preston 2005; Reynolds et al. 2005).

Given the heavy toll of diabetes on mortality and morbidity, public policies should address diabetes with more concerted public health efforts. The vast majority of people with diabetes, about 90 per cent, have type 2 diabetes (National Diabetes Information Clearinghouse 1999). Onset of type 2 diabetes can often be delayed or prevented with relatively modest lifestyle changes or pharmacotherapy (National Institute of Diabetes and Digestive and Kidney Diseases 2001). In one notable study, a regimen of diet and exercise alone reduced diabetes incidence considerably more (58 per cent) than a drug regimen (31 per cent) (National Institute of Diabetes and Digestive and Kidney Diseases 2001).

In addition to the global epidemic of diabetes that is predicted in the coming two decades (King et al. 1998), the prevalence of adult onset diabetes has risen dramatically among younger populations (Burke et al. 1999). Those with earlier onset accrue many more years of cumulative disease burden, resulting in more pronounced morbidity and disability even at younger old age (Songer 2001). Public administrators and other health authorities responsible for diabetes reduction programs require little support from highly advanced or expensive technologies. The primary mechanisms of diabetes prevention are modest weight loss and exercise. Promoting these lifestyle changes successfully would provide many collateral health benefits, including reduced rates of hypertension, heart disease, stroke and dementia. The costs to society and individuals of measures required to delay or prevent diabetes onset are not great, particularly when weighed against the benefits of substantially longer and healthier life.

Freedman and her colleagues (2006) weighed alternative policy interventions. They compared interventions aimed at reducing the prevalence of disability in the older population by translating the evidence of studies focusing on various risk factors and interventions. These researchers used an expert

panel of 12 and a modified Delphi approach; each expert ranked 12 interventions aimed at reducing disability. This yielded three possible interventions: (1) programs to promote physical activity; (2) screening and treatment programs for depression; and (3) programs to reduce the incidence of falls. Freedman and her colleagues conducted a systematic review of the literature for evidence of effectiveness for each intervention. Accounting for the size of the population, the effect of the risk factor targeted for intervention and the effect of the intervention, they concluded that in the short-run fall prevention programs would have a greater effect than exercise or screening and treatment for depression. However, Freedman et al. (2006) emphasized that longer-term effects also need to be considered. This approach could be applied to evaluate other health promotion/preventative alternatives. It is also worth noting, however, that in the United States, in particular, relatively few public resources are devoted to health promotion. Given the potentially large gains in active life expectancy associated with healthy lifestyles – and the concomitant potential for large public savings for health care and long-term care – it seems reasonable to suggest that providing more resources for health promotion would be a sound investment.

Implications for Practice

Practitioners should focus on strategies to maintain and even enhance physical activity among the old and near-old. Resistance training can improve strength, agility, balance and bone mass, thereby promoting more active lifestyles and reducing risks of injuries commonly associated with declining functional status (Fiatarone et al. 1994; McCartney et al. 1996). The improved health status that results from resistance training and other forms of physical activity has also been shown to reduce levels of acute and chronic disease (Blair et al. 1996; Rowe and Kahn 1998). Exercise can maintain or improve both physical and cognitive functions (Binder et al. 2002; Kramer et al. 2006; Rydwick et al. 2004). At least one study found that exercise can reduce ADL disability (Penninx et al. 2001). Further, home based physical therapy programs have been shown to have modest, yet consistent effects in slowing the decline of functional

status in frail older people (Gill et al. 2002, 2004). Practitioners should become more pro-active in promoting exercise and healthier lifestyles among the older persons they serve. Lifestyle changes seldom come easily. But education and motivation play an important role in bringing them about.

Directions for Future Research

As for future research, we suggest several areas for additional study. Most research in this area has examined disability trajectories for single ADLs separately, or for an indicator of an individual's being impaired in "one or more" ADLs, or in some instances for simple counts of ADLs. None of these approaches adequately addresses the joint dynamics of ADL disability. Future research should address this limitation of active life expectancy research, modeling the joint effects of ADL trajectories. Further methodological advances in this area are much needed. Similarly, cognitive function plays an important role in the disablement process. Much more research is needed to identify the joint dynamics of physical and cognitive function.

The way in which disability is defined – the threshold of difficulty or help that is required to identify an individual as being disabled – influences estimates of the prevalence of disability and eligibility for services and may disproportionately affect some subgroups (Jenkins and Laditka 2003; Laditka and Jenkins 2001). For example, older women are more likely to live alone, so may be less likely to report receiving help. They may therefore be judged less eligible for publicly supported assistance in the home. More research is needed about the way disability is defined, including studies of this issue focused in developing countries. A related issue is research to understand how people in successive cohorts interpret survey questions about disability. Almost all existing research on active life expectancy assumes that individuals in different cohorts interpret questions about disability in the same way. If individuals in successive cohorts in fact interpret these questions differently, this might notably influence estimates of changing disability rates over time. Analogous research should examine whether individuals in different groups, defined by race or ethnic-

ity, for example, or educational attainment or income, interpret such questions differently. Use of assistive technology will play a greater role in helping older people live in the community. Future surveys should ask participants about their use of assistive devices independently of questions related to disability (Cornman et al. 2005).

Another useful area for future research relates to survey design. Influential findings in active life expectancy research often rely on longitudinal survey data. Such data commonly represent measurements taken at intervals of several years. These measurements are likely to miss a considerable number of transitions in functional status and this missing data almost certainly biases estimates of active life expectancy. Laditka and Wolf (2006) have demonstrated how longitudinal surveys could be improved in this regard, by asking retrospective questions about periods with and without disability since a previous survey wave. Despite a modest increase in respondent burden and the likelihood of introducing a degree of recall bias, this approach is likely to notably improve estimates of active life expectancy. Those who create new longitudinal surveys with disability measures, or who revise existing ones, should consider applying these lessons.

Finally, more work is needed to objectively measure both disability status (e.g., Daltroy et al. 1995) and risk factors. For example, longitudinal studies beginning at younger ages that incorporate both objective measures of disability and accelerometer measurements of physical activity would be highly useful for providing improved estimates of the association between physical activity and active life expectancy.

Conclusions

Clearly, policies should more strongly promote healthy behaviors, particularly to address the pandemic of diabetes and obesity. However, a greater emphasis on healthy lifestyles will not address all of the disparities suggested by our results. For many groups affected by health disparities, environmental and other hazards that can exert strong effects on health throughout the life course are difficult to avoid (George 2005). It seems likely that large public policy initiatives may be

required to begin to reduce disparities in health status. Thus, in addition to promoting individual healthy choices, it would be useful to promote changes at the community level that would address risks to health. It may also be useful to address barriers to healthy lifestyles in the built environment – promoting physical activity, for example, by ensuring that people have safe and inviting alternatives for activity.

In developed countries, most people, except the very oldest ages, live relatively active lives – at least in the formal sense of this phrase used in the research discussed in this chapter. The reality of life for us all is that the distinction between “active” and “inactive” life disguises a continuum of functional ability. Recognizing this continuum only adds to the complexity of active life expectancy research, already illustrated in our review. Regardless of how we may define disability, however, long-term care will exert pressing demands on the resources of many countries in the coming decades. In much of the developed world, the large baby boom cohort will require a great deal of health care and long-term care. Nonetheless, our review suggests, as nations, communities and individuals we can limit decline, enhance recovery and extend active life.

References

- Albert M, Brown DR, Buchner D, Laditka JN, Launer LJ, Scherr P, Thies W, Wagster MV (2007) The healthy brain and our aging population: Translating science to public health practice. Foreword. *Alzheimer's and Dementia* 3: S3–S5
- Auchincloss AH, Hadden W (2002) The health effects of rural-urban residence and concentrated poverty. *J Rural Health* 18(2):319–336
- Auchincloss AH, Van Nostrand JF, Ronsaville D (2001) Access to health care for older persons in the United States: Personal, structural, and neighborhood characteristics. *J Aging Health* 13(3):329–354
- Balfour JL, Kaplan GA (2002) Neighborhood environment and loss of physical function in older adults: Evidence from the Alameda County Study. *Am J Epidemiol* 155(6):507–515
- Bebbington A, Bajekal M (2003) Sub-national variations in health expectancy. In: Robine JM, Jagger C, Mathers CD, Crimmins EM, Suzman RM (eds) *Determining health expectancies*, Wiley, West Sussex, UK, pp 127–147
- Becket LA, Brock DB, Lemke JH, Mendes de Leon C, Guralnik JM, Fillenbaum GG, Branch LG, Wetle TT, Evans DA (1996) Analysis of change in self-reported physical function among older persons in four population studies. *Am J Epidemiol* 143:766–778

- Bélanger A, Martel L, Berthelot JM, Wilkins R (2002) Gender differences in disability-free life expectancy for selected risk factors and chronic conditions in Canada. *J Women Aging* 14:61–83
- Binder EF, Schechtman KB, Ehsani AA, Seger-May K, Brown M, Sinacore DR, Yarasheski KE, Holloszy JO (2002) Effects of exercise training on frailty in community-dwelling older adults: Results of a randomized, controlled trial. *J Am Geriatr Soc* 50(12):1921–1928
- Blackwell DL, Hayward MD, Crimmins EM (2001) Does childhood health affect chronic morbidity in later life? *Soc Sci Med* 52:1269–1284
- Blair SN, Kampert JB, Kohl HW, Barlow CE, Macera CA, Paffenbarger RS, Gibbons LW (1996) Influences of cardiorespiratory fitness and other precursors on cardiovascular disease and all-cause mortality in men and women. *J Am Med Assoc* 276:205–210
- Bone MR, Bebbington AC, Nicolaas G (1998) Policy applications of health expectancy. *J Aging Health* 10:136–153
- Branch LG, Guralnik JM, Foley DJ, Kohout FJ, Wetle TT, Ostfeld A, Katz S (1991) Active life expectancy for 10,000 Caucasian men and women in three communities. *J Gerontol: Med Sci* 46:M145–M150
- Brookmeyer R, Gray S, Kawas C (1998) Projections of Alzheimer's disease in the United States and the public health impact of delaying disease onset. *Am J Public Health* 88:1337–1342
- Burke JP, Williams K, Gaskill SP, Hazuda HP, Haffnew SM, Stern MP (1999) Rapid rise in the incidence of type 2 diabetes from 1987 to 1996. *Arch Intern Med* 159(13):1450–1456
- Cambois EE (2006) The relationship between occupational status, mobility, and mortality at older ages. In: Yi Z, Crimmins E, Carrière Y, Robine JM (eds) *Longer life and healthy aging*. Springer, The Netherlands, pp 213–234
- Christen WG, Glynn RJ, Hennekens CH (1996) Antioxidants and age-related eye disease. *Ann Epidemiol* 6:60–66
- Clarke P, George LK (2005) The role of the built environment in the disablement process. *Am J Public Health* 95(11):1933–1939
- Cohen ML (1991) Variance estimation of microsimulation models through sample reuse. In: Citro CF, Hanushek EA (eds) *Improving information for social policy decisions: the uses of microsimulation modeling*, Vol II, Technical papers, National Academy Press, Washington, DC, pp 237–254
- Colvez A, Blanchet M (1981) Disability trends in the United States population, 1966–1976. Analysis of reported causes. *Am J Public Health* 71:464–471
- Cornman JC, Freedman VA, Agree EM (2005) Measurement of assistive device use: Implications for estimates of device use and disability in later life. *Gerontologist* 45:347–358
- Crimmins EM (1996) Mixed trends in population health among older adults. *J Gerontol: Soc Sci* 51B:S223–S225
- Crimmins EM (2004) Trends in health of the elderly. *Annu Rev Public Health* 25:79–98
- Crimmins EM, Alley D, Reynolds SL, Johnston M, Karlamangla A, Seeman T (2005) Changes in biological markers of health: Older Americans in the 1990s. *J Gerontol: Med Sci* 60A(11):1409–1413
- Crimmins EM, Hayward MD, Saito Y (1994) Changing mortality and morbidity rates and the health status and life expectancy of the older population. *Demography* 31:159–175
- Crimmins EM, Hayward MD, Saito Y (1996) Differentials in active life expectancy in the older population of the United States. *J Gerontol: Soc Sci* 51B:S111–S120
- Crimmins EM, Johnston M, Hayward M, Seeman T (2003) Age differences in allostatic load: An index of physiological dysregulation. *Exp Gerontol* 38:731–734
- Crimmins EM, Kim JK, Hagedorn A (2002) Life with and without disease: Women experience more of both. *J Women Aging* 14:47–59
- Crimmins EM, Saito Y (2001) Trends in healthy life expectancy in the United States 1970–1999: Gender, racial, and educational differences. *Soc Sci Med* 52:1629–1641
- Crimmins EM, Saito Y, Ingegneri D (1989) Changes in life expectancy and disability-free life expectancy in the United States. *Popul Dev Rev* 15:235–267
- Crimmins EM, Saito Y, Ingegneri D (1997) Trends in disability-free life expectancy in the United States, 1970–1990. *Popul Dev Rev* 23:555–572
- Crimmins EM, Saito Y, Reynolds SL (1997) Further evidence on recent trends in the prevalence and incidence of disability among older Americans from two sources: The LSOA and the NHIS. *J Gerontol: Soc Sci* 52B:S59–S71
- Cutler DM, Landrum MB, Stewart K (2006) Intensive medical care and cardiovascular disease disability reductions. NBER Working Paper Series No. 21184, Cambridge, MA
- Daltroy L, Phillips C, Eaton H, Larson M, Partridge A, Loggion M, Liang MH (1995) Objectively measuring physical ability in elderly persons: The physical capacity evaluation. *Am J Public Health* 85(4):558–560
- Davis WB, Hayes CG, Knowles M, Riggan WB, Van Braggen J, Tyroler HA (1985) Geographic variation in declining ischemic heart disease mortality in the United States, 1968–1978. 1. Rates and changes, whites, aged 35–74 years. *Am J Epidemiol* 122:657–672
- Desai M, Pratt LA, Lentzer H, Robinson KN (2001) Trends in vision and hearing among older Americans. *Aging Trends* 2:1–8
- Deeg DJH (2001) Sex-differences in the evolution of life expectancy and health in old age. In: Robine JM, Kirkwood TBL, Allard M (eds) *Sex and longevity: sexuality, gender, reproduction, parenthood*, Springer-Verlag, New York, pp 129–140
- Deeg DJH (2005) Longitudinal characterization of course types of function limitations. *Disabil Rehabil* 27(5):253–261
- Doblhammer G, Kytir J (2001) Compression or expansion of morbidity? Trends in healthy-life expectancy in the elderly Austrian population between 1978 and 1998. *Soc Sci Med* 52:385–391
- Elo IT (2001) New African American life tables from 1935–1940 to 1985–1990. *Demography* 38:97–114
- Elo IT, Preston SH (1997) Racial and ethnic differences in mortality at older ages. In: Martin LG, Soldo BJ (eds) *Racial and ethnic differences in the health of older Americans*, National Academy Press, Washington, DC, pp 10–42
- Fiatarone MA, O'Neill EF, Ryan ND, Clements KM, Solares GR, Nelson ME, Roberts SB, Kehayis JJ, Lipsitz LA, Evans WJ (1994) Exercise training and nutritional supplementation for physical frailty in very elderly people. *New Engl J Med* 330:1769–1775

- Freedman VA, Agree EM, Martin LG, Cornman JC (2005) Trends in the use of assistive technology in personal care for late-life disability, 1992–2001. *Gerontologist* 46(1):124–127
- Freedman VA, Crimmins EM, Schoeni RF, Spillman BC, Aykan H, Kramarow E, Land K, Lubitz J, Manton K, Martin LG, Shinberg D, Waidmann T (2004) Resolving inconsistencies in old age disability trends: report from a technical group. *Demography* 41:417–441
- Freedman VA, Hodgson N, Lynn J, Spillman BC, Waidmann T, Wilkinson AM, Wolf DW (2006) Promoting declines in the prevalence of late-life disability: Comparisons of three potentially high-impact interventions. *Milbank Q* 84(3):493–520
- Freedman VA, Martin LG (1998) Understanding trends in functional limitations among older Americans. *Am J Public Health* 88:1457–1462
- Freedman VA, Martin LG (1999) The role of education in explaining and forecasting trends in functional limitations among older Americans. *Demography* 36:461–473
- Freedman VA, Martin LG (2000) Contributions of chronic conditions to aggregate changes in old-age functioning. *Am J Public Health* 90:1755–1760
- Freedman VA, Martin LG, Schoeni RE (2002) Recent trends in disability and functioning among older adults in the United States: A systematic review. *J Am Med Assoc* 288(24):3137–3146
- Freedman VA, Soldo BJ (eds) (1994) Trends in disability at older ages: Summary of a workshop. National Academy Press, Washington, DC
- Fries JF (1980) Aging, natural death, and the compression of morbidity. *New Engl J Med* 303:130–135
- Fries JF (1988) Aging, illness, and health policy: Implications of the compression of morbidity. *Perspect Biol Med* 21:407–428
- Fries JF (2002) Reducing disability in older age. [editorial] *J Am Med Assoc* 288(24):3164–3166
- Fuchs VR (1974) *Who shall live?* Basic Books, New York
- Fukuda Y, Nakamura K, Takano T (2005) Municipal health expectancy in Japan: Decreased healthy longevity of older people in socioeconomically disadvantaged areas. *BMC Public Health* 5:65
- George LK (2005) Socioeconomic status and health across the life course: Progress and prospects. *J Gerontol: Psychol Soc Sci* 60(Suppl1):135–139
- Geronimus AT, Bound J, Waidmann TA, Colen CG, Steffick D (2001) Inequity in life expectancy, functional status, and active life expectancy across selected black and white populations in the United States. *Demography* 38:227–251
- Gill T, Baker D, Gottschalk M, Peduzzi P, Allore H, Byers A (2002) A program to prevent functional decline in physically frail, elderly persons who live at home. *New Engl J Med* 347(14):1068–1074
- Gill T, Baker D, Gottschalk M, Peduzzi P, Allore H, Van Ness P (2004) A prehabilitation program for the prevention of functional decline: Effect on higher-level physical function. *Arch Phys Med Rehabil* 85(7):1043–1049
- Gruenberg EM (1977) The failures of success. *Milbank Mem Fund Q* 55:3–24
- Grundy E (2006) Gender and healthy aging. In: Yi Z, Crimmins E, Carrière YY, Robine JM (eds) *Longer life and healthy aging*. Springer, The Netherlands, pp 173–199
- Gu K, Cowie CC, Harris MI (1998) Mortality in adults with and without diabetes in a national cohort of the US population, 1971–1993. *Diab Care* 21(7):1138–1145
- Gutierrez-Fisac JL, Gispert R, Sola J (2000) Factors explaining the geographical differences in disability free life expectancy in Spain. *J Epidemiol Community Health* 54:451–455
- Guralnik JM, Land KC, Blazer D, Fillenbaum GG, Branch LG (1993) Educational status and active life expectancy among older blacks and whites. *New Engl J Med* 329(2):110–116
- Hammond C (2003) How education makes us healthy. *London Rev Edu* 1(1):61–78
- Hardy SE, Gill TM (2004) Recovery from disability among community-dwelling older persons. *J Am Med Assoc* 291:1596–1602
- Hayward MD, Crimmins EM, Miles TP, Yang Y (2000) The significance of socioeconomic status in explaining the racial gap in chronic health conditions. *Am Sociol Rev* 65:910–930
- Hayward MD, Crimmins EM, Saito Y (1998) Causes of death and active life expectancy in the older population of the United States. *J Aging Health* 10:192–213
- Hayward MD, Gorman BK (2004) The long arm of childhood: The influence of early-life social conditions on men's mortality. *Demography* 41(1):87–107
- Hayward MD, Grady WR (1990) Work and retirement among a cohort of older men in the United States 1966–1983. *Demography* 27:337–356
- Hayward MD, Heron M (1999) Racial inequity in active life among adult Americans. *Demography* 36:77–91
- Helmer C, Barberger-Gateau P, Letenneur L, Dartigues JF (1999) Subjective health and mortality in French elderly women and men. *J Gerontol: Soc Sci* 54B:S84–S92
- Hendrie HC, Albert MS, Butters MA, Gao S, Knopman DS, Launer LJ, Yaffe K, Cuthbert BN, Edwards E, Wagster MV (2006) The NIH cognitive and emotional health project: Report of the critical evaluation study committee. *Alzheimer's and Dementia* 2(1):12–32
- Jacobzone S (2000) Coping with aging: International challenges. *Health Affairs* 19:213–225
- Jagger C (1999) Health expectancy calculation by the Sullivan method: a practical guide. European concerted action on the harmonization of health expectancy calculations in Europe (EURO-REVES). Nihon University Population Research Institute Research Paper Series No. 68. Tokyo, Japan
- Jagger C, Barberger-Gateau P, Robine JM (2005) Disability in older people – indicators, process and outcomes. *Disabil Rehabil* 27(5):209–212
- Jagger C, Goyder E, Clarke M, Brouard N, Arthur A (2003) Active life expectancy in people with and without diabetes. *J Public Health Med* 25(1):42–46
- Jagger C, Matthews F (2002) Gender differences in life expectancy free of impairment at older ages. *J Women Aging* 14:85–97
- Jagger C, Raymond N, Morgan K (1998) Planning for the future: The effect of changing mortality, incidence, and recovery rates on life expectancy with visual disability. *J Aging Health* 10:154–170
- Jagger C, Spiers N, Arthur A (2005) The role of sensory and cognitive function in the onset of activity restriction in older people. *Disabil Rehabil* 27(5):277–283
- Jenkins CL, Laditka SB (2003) A comparative analysis of disability measures and their relation to home health care use. *Home Health Care Serv Q* 22(1):21–37

- Jitapnkul S, Kunanusont C, Phoolcharoen W, Suriyawongpaisal P, Ebrahim S (2003) Disability-free life expectancy of elderly people in a population undergoing demographic and epidemiologic transition. *Age and Aging* 32:401–405
- Kalbfleisch JD, Lawless JF (1985) The analysis of panel data under a Markov assumption. *J Am Stat Assoc* 80:863–871
- Kaneda T, Zimmer Z, Tang Z (2005) Socioeconomic status differentials in life and active life expectancy among older adults in Beijing. *Disabil Rehabil* 27(5):241–251
- King H, Aubert RE, Herman WH (1998) Global burden of diabetes, 1995–2025. Prevalence, numerical estimates, and projections. *Diabetes Care* 21(9):1414–1431
- Kinsella K, Gist YJ (1998) International brief: Gender and aging. Bureau of the Census, Washington, DC
- Kramer AF, Erickson KI, Colcombe SJ (2006) Exercise, cognition, and the aging brain. *J Appl Physiol* 101:1237–1242
- Kramer M (1983) The increasing prevalence of mental disorders: A pandemic threat. *Psychiatr Q* 55:115–143
- Laditka JN, Laditka SB (2006) Effects of diabetes on healthy life expectancy: Shorter lives with more disability for both women and men. In: Yi Z, Crimmins E, Carrière Y, Robine JM (eds) *Longer life and healthy aging*. Springer, The Netherlands, pp 71–90
- Laditka JN, Laditka SB (2000) The morbidity compression debate: Risks, opportunities, and policy options for women. *J Women Aging* 12(1/2):23–38
- Laditka JN, Laditka SB, Olatosi B, Elder KT (2007) The health tradeoff of rural residence for impaired older adults: Longer life, more impairment. *J Rural Health* 23(2):124–132
- Laditka JN, Wolf DA (2006) Improving knowledge about disability transitions by adding retrospective information to panel surveys. *Popul Health Metrics* 4:16
- Laditka SB (ed) (2002) *Health expectations for older women: International perspectives*. Haworth Press
- Laditka SB, Hayward MD (2003) The evolution of demographic methods to calculate health expectancies. In: Robine JM, Jagger C, Mathers C, Crimmins E, Suzman R (eds) *Determining health expectancies*. Wiley, Baffins Lane, Chichester, Sussex, UK, pp 221–234
- Laditka SB, Jenkins CL (2001) Difficulty or dependency? Effects of measurement scales on disability prevalence among older Americans. *J Health Soc Policy* 13(3):1–15
- Laditka SB, Laditka JN (2001) Effects of improved morbidity rates on active life expectancy and eligibility for long-term care services. *J Appl Gerontol* 10:39–56
- Laditka SB, Laditka JN (2002) Recent perspectives on active life expectancy for older women. *J Women Aging* 14(1/2):163–184
- Laditka SB, Mastanduno MP, Laditka JN (2001) Health care use of individuals with diabetes in an employer-based insurance population. *Arch Intern Med* 161(10):1301–1308
- Laditka SB, Wolf DA (1998) New methods for analyzing active life expectancy. *J Aging Health* 10:214–241
- Land KC, Guralnik JM, Blazer DG (1994) Estimating increment-decrement life tables with multiple covariates from panel data: The case of active life expectancy. *Demography* 31:297–319
- Leveille SG, Penninx BW, Melzer D, Izmirlian G, Guralnik JM (2000) Sex differences in the prevalence of mobility disability in old age: the dynamics of incidence, recovery, and mortality. *J Gerontol: Soc Sci* 55B:S41–S50
- Lièvre A, Brouard N, Heathcote C (2003) The estimation of health expectancies from cross-longitudinal surveys. *Math Popul Stud* 10:211–248
- Lin G (2000) Regional assessment of elderly disability in the U.S. *Soc Sci Med* 50(7–8):1015–24
- Lubitz J, Beebe JB, Baker C (1995) Longevity and Medicare expenditures. *New Engl J Med* 33:999–1003
- Lubitz J, Cai L, Kramarow E, Lentzner H (2003) Health, life expectancy, and health care spending among the elderly. *New Engl J Med* 349 (11):1048–1055
- Mann WC, Ottenbacher K, Frass L, Tomita M, Granger CV (1999) Effectiveness of assistive technology and environmental interventions in maintaining independence and reducing home care costs for the frail elderly: A randomized trial. *Arch Family Med* 8:210–217
- Manton KG (1982) Changing concepts of morbidity and mortality in the elderly population. *Milbank Mem Fund Q* 60:183–191
- Manton KG, Corder L, Stallard E (1993) Estimates of change in chronic disability and institutional incidence and prevalence rates in the U.S. elderly population from the 1982, 1984, and 1989 National Long Term Care Survey. *J Gerontol: Soc Sci* 48:S153–S166
- Manton KG, Corder L, Stallard E (1997) Chronic disability trends in the U.S. elderly populations 1982 to 1994. *PNAS* 94:2593–2598
- Manton KG, Gu X (2001) Changes in the prevalence of chronic disability in the United States black and nonblack population above age 65 from 1982 to 1999. *PNAS* 11:6354–6359
- Manton KG, Stallard E (1997) Health and disability differences among racial and ethnic groups. In: Martin LG, Soldo BJ (eds) *Racial and ethnic differences in the health of older Americans*. National Academy Press, Washington, DC, pp 43–105
- Mathers CD, Murray JL, Lopez AD, Sadana R, Salomon JA (2002) Global patterns of healthy life expectancy for older women. *J Women Aging* 14:99–117
- Matthews RJ, Jagger C, Hancock RM (2006) Does socioeconomic advantage lead to a longer, healthier old age? *Soc Sci Med* 62(10):2489–2499
- Matthews KA, Kelsey SF, Meilahn EN, Kuller LH, Wing RR (1989) Educational attainment and behavioral and biologic risk factors for coronary heart disease in middle age women. *Am J Epidemiol* 129:1132–1144
- Matthews FE, Miller LL, Brayne C, Jagger C, the Medical Research Council Cognitive Function and Aging Study (MRC CFAS) (2006) Regional differences in multidimensional aspects of health: findings from the MRC cognitive function and ageing study. *BMC Public Health* 6:90
- McCartney N, Hicks AL, Martin J, Webber CE (1996) A longitudinal trial of weight training in the elderly: Continued improvements in year 2. *J Gerontol: Biol Sci* 51A: B425–B433
- McGovern PG, Burke GL, Spafka SX, Folsom AR, Blackburn H (1992) Trends in mortality, morbidity, and risk factor levels for stroke from 1960 through 1990: The Minnesota heart survey. *J Am Med Assoc* 268:753–759
- Minicuci N, Noale M (2005) Disability free life expectancy in older Italians. *Disabil Rehabil* 27(5):221–227
- Murtagh KN, Hubert HB (2004) Gender differences in physical disability among an elderly cohort. *Am J Public Health* 94 (8):1406–1411

- National Diabetes Information Clearinghouse (1999) Diabetes statistics. Bethesda, MD, National Institute of Diabetes and Digestive and Kidney Diseases, US National Institutes of Health, NIH Publication, pp. 99–3926
- National Institute of Diabetes and Digestive and Kidney Diseases (2001) Diet and exercise dramatically delay type 2 diabetes: diabetes medication Metformin also effective. Available at: http://niddk.nih.gov/welcome/releases/8_8_01.htm. Accessed September 24, 2001
- Olshansky SJ, Carnes BA, Rogers RA, Smith L (1997) Infectious diseases: New and ancient threats to world health. *Popul Bull* 52:1–58
- Olshansky SJ, Passaro DJ, Hershow RC, Layden J, Carnes BA, Brody J, Hayflick L, Butler RN, Allison DB, Ludwig DS (2005) A potential decline in life expectancy in the United States in the 21st Century. *New Engl J Med* 352(11):1138–1145
- Olshansky SJ, Wilkins R (1998) Introduction. *J Aging Health* 10:123–135
- Olsson J, Persson U, Tollin C, Nilsson S, Melander A (1994) Comparison of excess costs of care and production losses because of morbidity in diabetic patients. *Diabetes Care* 17(11):1257–1263
- Panapasa SV (2002) Disability among older women and men in Fiji: Concerns for the future. *J Women Aging* 14:149–162
- Penninx BW, Messier SP, Rejeski WJ, Williamson JD, DiBari M, Cavazzini C, Applegate WB, Pahor M (2001) Physical exercise and the prevention of disability in activities of daily living in older persons with osteoarthritis. *Arch Intern Med* 161(19):2309–2316
- Peres K, Verret C, Alioum A, Barberger-Gateau P (2005) The disablement process: Factors associated with progression of disability and recovery in French elderly people. *Disabil Rehabil* 27(5):263–276
- Pope AM, Tarlov A (eds) (1991) Disability in America: Toward a national agenda for Prevention. National Academy Press, Washington, DC
- Porell FW, Miltiades HB (2002) Regional differences in functional status among the aged. *Soc Sci Med* 54(8):1181–1198
- Preston SH (2005) Deadweight? – The influence of obesity on longevity [editorial]. *New Engl J Med* 352(1):1135–1137
- Preston SH, Elo I, Rosenwaike I, Hill M (1996) African American mortality at older ages: Results from a matching study. *Demography* 33:193–209
- Preston SH, Taubman P (1994) Socioeconomic differences in adult mortality and health status. In: Martin LG, Preston SH (eds) *Demography of aging*, National Academy Press, Washington, DC, pp 279–318
- Réseau Espérance de Vie en Santé (International Network on Health Expectancy and the Disability Process). Available at: <http://www.prw.le.ac.uk/cgi-bin/reves/history.cgi>. Accessed October 20 2006
- Reed DM, Foley DJ, White LR, Heimovitz H, Burchfiel CM, Masaki K (1998) Predictors of healthy aging in men with high life expectancies. *Am J Public Health* 88:1463–1468
- Reyes-Beaman S, Jagger C, Garcia-Pena C, Munoz O, Beaman PE, Stafford B, the National Group of Research on Ageing (2005) Active life expectancy of older people in Mexico. *Disabil Rehabil* 27(5):213–219
- Reynolds SL, Saito Y, Crimmins EM (2005) The impact of obesity on active life expectancy in older American men and women. *Gerontologist* 45(4):438–444
- Robine JM, Jagger C, Cambois E (2002) European perspectives on healthy aging in women. *J Women Aging* 14:119–133
- Robine JM, Jagger C, Mathers C, Crimmins EM, Suzman R (eds) (2003) *Determining health expectancies*. Wiley, Baffins Lane, Chichester, Sussex, UK
- Robine JM, Mormiche P, Sermet C (1998) Examination of the causes and mechanisms for the increase in disability-free life expectancy. *J Aging Health* 10:171–191
- Robine JM, Ritchie K (1991) Healthy life expectancy: Evaluation of a global indicator of change in population health. *Br Med J* 302:457–460
- Robine JM, Romieu I, Cambois E (1997) Health expectancies and current research. *Rev Clin Gerontol* 7:73–81
- Ross CE, Wu CL (1995) The links between education and health. *Am Sociol Rev* 60:719–745
- Rowe JW, Kahn RL (1998) *Successful aging*. Pantheon, New York
- Rydwick E, Frandin K, Akner G (2004) Effects of physical training on physical performance in institutionalized elderly patients (70+) with multiple diagnoses. *Age Aging* 33(1):13–23
- Sabates R, Feinstein L (2006) The role of education in the uptake of preventive health care: The case of cervical screening in Britain. *Soc Sci Med* 62(12):2998–3010
- Sauvaget C, Tsuji I, Aonuma T, Hisamichi S (1999) Health-life expectancy according to various functional levels. *J Am Geriatr Soc* 47:1326–1331
- Schoen R (1975) Constructing increment-decrement life tables. *Demography* 12:313–324
- Schoen R (1988) *Modeling multigroup populations*. Plenum, New York
- Schoen R, Woodrow K (1980) Labor force status life tables for the United States 1972. *Demography* 17:297–322
- Schoeni RF, Freedman VA, Wallace RB (2001) Persistent, consistent, widespread, and robust? Another look at recent trends in old-age disability. *J Gerontol: Soc Sci* 56B:206–S281
- Schoeni RF, Martin LG, Andreski PM, Freedman VA (2005) Persistent and growing socioeconomic disparities in disability among the elderly, 1982–2002. *Am J Public Health* 95(11):2065–2070
- Songer TJ (2001) Disability in diabetes. *Diabetes in America*, 2nd edn. National Institutes of Health, Bethesda, MD, pp. 259–282. <http://diabetes-in-america.s-3.com>. Accessed on August 27 2001
- Spiers N, Jagger C, Clarke M (1996) Physical function and perceived health: Cohort differences and interrelationships in older people. *J Gerontol: Soc Sci* 51B:S226–S233
- Sullivan DF (1971) A single index of mortality and morbidity. *HSMHA Health Rep* 86:347–354
- Tsuji I, Sauvaget C, Hisamichi S (2002) Health expectancies in Japan: Gender differences and policy implications for women. *J Women Aging* 14:135–148
- United States Census Bureau (2000) *International Database*. Available at: <http://www.census.gov/ipc/www/idbnew.html>. Accessed on July 3 2001

- U.S. Department of Health, Education, Welfare (HEW) (1969) Towards a social report. Government Printing Office, Washington, DC
- van Baal PHM, Hoogenveen RT, de Wit GA, Boshuizen HC (2006) Estimating health-adjusted life expectancy conditional on risk factors: Results for smoking and obesity. *Popul Health Metrics* 4:1–14
- Vaupel JW, Carey JR, Christensen K, Johnson TE, Yashin AI, Holm NV, Iachine IA, Kannisto V, Khazaeli AA, Liedo P, Longo VD, Zeng Y, Manton KG, Curtsinger JW (1998) Biodemographic trajectories of longevity. *Science* 280:855–860
- Verbrugge LM (1984) Longer life but worsening health? Trends in health and mortality of middle-aged and older persons. *Milbank Q* 63:475–519
- Vita AJ, Terry RB, Hubert HB, Fries JF (1998) Aging, health risks, and cumulative disability. *New Engl J Med* 338:1035–1041
- Waidmann TA, Liu K (2000) Disability trends among elderly persons and implications for the future. *J Gerontol: Soc Sci* 55B:S298–S307
- Wen M, Browning CR, Cagney KA (2003) Poverty, affluence and income inequality: Neighborhood economic structure and its implications for health. *Soc Sci Med* 57:843–860
- Wister AV (1996) Effects of socioeconomic status on exercise and smoking: Age-related differences. *J Aging Health* 8: 467–488
- Wolf DA (2001) The role of microsimulation in longitudinal data analysis. *Canadian Studies in Population: special issue on Longitudinal Methodology* 28(2):313–339
- Wolf DA, Laditka SB, Laditka JN (2002) Patterns of active life among older women: Differences within and between groups. *J Women Aging* 14(1/2):9–26
- Yi Z, Crimmins E, Carrière Y, Robine JM (eds) (2006) Longer life and healthy aging. Springer, The Netherlands
- Yi Z, Yuzhi L, George LG (2006) Female disadvantages among the elderly in China. In: Yi Z, Crimmins E, Carrière Y, Robine JM (eds) Longer life and healthy aging, Springer, The Netherlands, pp 201–211

Chapter 25

Demography of Disability

Scott M. Lynch, J. Scott Brown and Miles G. Taylor

Introduction

The study of mortality was the foundation on which the discipline of demography was built. Over the past several decades, mortality research has expanded to include not only consideration of the remaining years of life individuals in contemporary society can expect to have but also consideration of the quality of that remaining life individuals can anticipate. A key determinant of quality of life, especially in later life, is health. In later life, it is expected that health declines and so a major concern of demographers has become the assessment of the prevalence of poor health at both individual and societal levels. Aside from health conditions that threaten survival, in later life a key issue is physical limitation that arises in part from health conditions that result from natural processes of aging and the social context within which they are experienced. At older ages, eyesight and hearing fade, joints stiffen and weaken, circulation becomes impaired, lung capacity declines, bone density diminishes and as a result, the prevalence of overall physical limitations tends to increase. Not all individuals experience declines in functioning but many do. The demography of disability is primarily concerned with understanding this decline in later-life functioning and is increasingly focused on inter-individual differences (i.e., heterogeneity) in this process.

Since the 1970s, the demography of disability has emerged in part as a response to declining mortality

in developed countries. In brief, extended longevity has allowed chronic illnesses and their accompanying physical limitations to become major concerns for researchers, especially given that most developed countries are experiencing rapid population aging with its associated financial costs in the form of medical and rehabilitative care.

In this chapter, we discuss the major issues in the demography of disability, including the current theoretical perspectives on disability in the field, the measurement of disability in demographic research, the modeling strategies employed by researchers, heterogeneity in disability across demographic indicators and the current state of knowledge regarding disability in the developed world. Our focus in this chapter largely excludes the study of disability in the developing world, because to date most research has focused on disability that has accompanied the rapid life expectancy gains seen in the developed world. Prior to the drastic increase in life expectancy seen in the developed world since WWII, old-age disability prevalence was quite low. It has only been the rapid increase in life expectancy that has brought the demography of disability to the forefront of research and policy.

Theory and Measurement of Disability

The name “the demography of disability” seems to imply that disability is easily and succinctly conceptualized and defined. In fact, conceptualizing and defining disability is notoriously difficult and studies that fall in this genre of research have studied very disparate phenomena. For example, some demographic studies have focused on work limitations (e.g., see

S. M. Lynch (✉)
Department of Sociology
Princeton University
159 Wallace Hall
Princeton, NJ 08544, USA
E-mail: slynch@princeton.edu

Burkhauser et al. 2002 for discussion), largely because few datasets and virtually no vital statistics data include more theoretically grounded disability measures. This trend is changing, however. For example, the long-running Panel Study of Income Dynamics has been used in demographic research for almost 40 years but it has recently added more extensive health measures including some traditional disability measures.

In this chapter, we do not discuss work-related disability, largely because work limitations have little to do with aging-related disability and are, thus, not used in most demographic analyzes. The primary focus of the demography of disability is on disability that occurs with aging and so we discuss theories and perspectives of aging-related disability.

Perspectives on Disability

Multiple perspectives have emerged and evolved in an attempt to conceptualize disability in a uniform manner. These perspectives differ in their emphases and applications but all of them expand on the medical model of disease, where only the characteristics of the individual – and not the environment – are salient to disability and its prediction (Freedman et al. 2004).

The classic functional model developed by Nagi in 1965 is one of the original attempts to distinguish between a purely clinical conceptualization of disability and a social one amenable to a more nuanced or holistic understanding of health in later life. Nagi's model differentiates several terms commonly used in the study of disability, including (1) pathology, (2) impairment, (3) functional limitation and (4) disability. In Nagi's schema, pathology is the ultimate

source of disability but is not an end in itself. Instead, pathology (e.g., chronic disease) produces physical impairment so that an individual cannot physically perform. The inability to perform physically becomes a functional limitation when impairment problematizes a major activity like movement. Finally, functional limitation becomes disability when impairment makes it impossible for one to fulfill social roles. For example, movement limitation is considered a disability when an individual is unable to get around and perform social and other activities necessary for independent living.

As an example of the disablement process under Nagi's schema, consider peripheral vascular disease that occurs with aging. This disease produces physical impairment when poor circulation in the legs, for example, makes the legs cramp (called claudication). This impairment becomes a functional limitation when it becomes severe enough that an individual cannot move around comfortably and it becomes a disability when the individual reports that she/he cannot walk without difficulty, making it impossible to live independently.

Nagi's conceptualization is notable because it moved past the biological characteristics of an individual and emphasized the importance of social context (1965, 1976). In addition, Nagi illustrated disability as a process starting with pathology and leading through a pathway of impairment to disability. Disability was defined as "limitation in performing socially defined roles and tasks", a great shift from a medical definition purely focusing on loss of system function or the limitation of medically defined actions.

Verbrugge and Jette (1994) refined Nagi's model, in part by focusing primarily on the functional limitation and disability relationship and the intervening social factors relevant to the process of preventing or

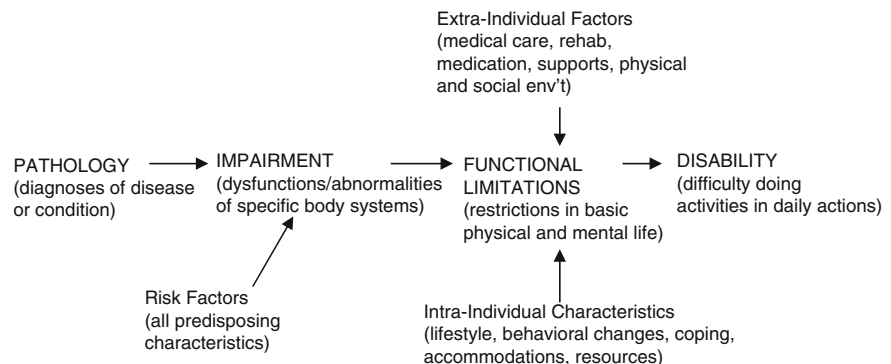


Fig. 25.1 Verbrugge and Jette Theoretical Model of Disablement (1994)

transforming functional limitation into disability. This model offers theoretical benefits to social scientists studying disability. Namely, this model emphasizes a causal path in the process leading from pathology to disability and it proposes that risk factors, extra-individual factors and intra-individual characteristics work at specific times in the disablement process (see Fig. 25.1).

Verbrugge and Jette (1994) defined disablement as “impacts that chronic and acute conditions have on the functioning of specific body systems and on people’s abilities to act in necessary, usual, expected and personally desired ways in their society”. They proposed the dynamic and social processes involved in living with, recovering from and accumulating disability. The authors emphasize the concept of disability as couched in a social context. Although functional limitations may be measured objectively using survey items capturing physical impairment, the inability to act in ways that are socially expected (such as activities of daily living) is more salient to the individual. The authors note the importance of disability as an outcome, as some pathology translates into difficulty performing in a social context.

Although it is probable that the intervening factors in this model do not work solely at the time points suggested, the emphasis on process and timing is a notable strength compared to previous work. In addition, the framework has been noted as rich in its assumptions of how varying aspects of “capital” (including human, personal and social capital) fuel the acceleration or deceleration of this negative outcome (O’Rand 2001). Further, the emphasis Verbrugge and Jette (1994) placed on heterogeneity, both among the disabled and in the process of disablement over time for an individual, make it the primary model applied to the disablement process in multiple research disciplines.

Prior to Verbrugge and Jette’s contribution, in 1980 the World Health Organization attempted to unify the conceptual frameworks and measurement of disability in order to provide a standard definition and measure by which individuals and nations could be compared. This conceptual model is consistent with the definition of health provided in 1948, which broke away from the medical model and encompassed individual health as multifaceted. In 2002, this framework was revised to emphasize a biopsychosocial model that encompasses both biological and social aspects of disability (see Fig. 25.2). This current model weighs health

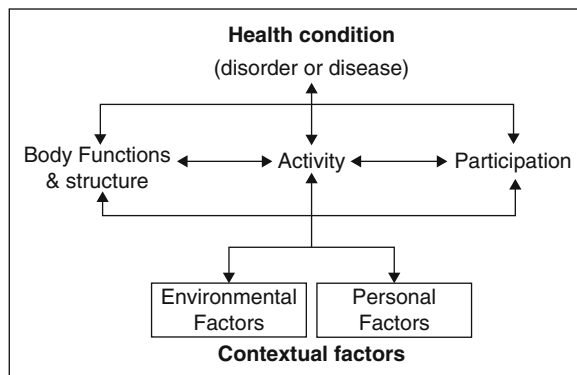


Fig. 25.2 International classification of functioning, disabilities, and health (ICF)

Source: World Health Organization (2002:9).

conditions and contextual factors as equal in salience to an individual’s functioning. In addition, this recent version accounts for the effects of different types of functioning on health conditions and contextual factors, therefore encompassing both health selection and the feedback loop that have been observed in studying disability as a process. Thus, this model helps resolve some of the temporal issues associated with the Verbrugge-Jette model and provides a more general framework for conceptualizing the disablement process across contexts (e.g., regions or nations).

Measurement of Disability

Under the models discussed, the key classes of measures studied by disability demographers include (1) measures of functional impairment or limitation and (2) measures of disability. Measures of impairment (or limitation) can be broken into two classes of measures: those which measure pain or weakness and those that evaluate the ability to perform physical tasks, like standing without help, lifting a 10 pound sack, etc. The former measures are not commonly used by demographers, while the latter are sometimes used. More commonly, demographers use broader measures of disability, which capture the ability to do larger tasks linked to basic social functioning, like being able to dress oneself. In other words, most demographic work measures disability as conceptualized under the Nagi and Verbrugge-Jette models.

The most commonly used measures of disability in this class are Activities of Daily Living (ADLs) items. The original ADL item list was constructed by Katz and colleagues (1963) and involved items measuring whether an individual could (1) bathe, (2) dress, or (3) feed him/herself, (4) use the toilet, (5) transfer (get in and out of bed or chair) by him/herself and (6) whether an individual was continent. Studies of disability since the 1960s have commonly used this, or a slightly altered, set of items, including dressing, bedding, bathing, toileting, walking, eating and/or grooming. Although the set of items for measuring ADLs has largely been standardized, the number of items included in studies has varied substantially from as many as ten (Lincare et al. 1994) to as few as three (Kempen et al. 1995). The range of items varies not only due to questionnaire design from which items are drawn but also from the division of some domains – like transferring – into subdomains. For example, researchers sometimes use separate questions on bed transfer and transfer from a chair.

ADLs, although representing distinct domains of functioning, were originally thought to occur in a particular, hierarchical order (Katz et al. 1963). The loss of each of the six original ADL items was observed in clinical studies to decline in order such that bathing and dressing abilities were lost first. The loss of ability to transfer from a bed or chair and the loss of ability to toilet independently were next, followed by incontinence and the inability to feed oneself. This order of loss was also observed to correspond directly with population prevalence rates for each limitation (i.e., bathing difficulties are typically the most prevalent and eating difficulties are the least prevalent). Critics of this hierarchy have noted, however, that about 15 per cent of the ADL disabled do not follow this pattern of decline and when scrutinized using multiple datasets and more rigorous methodologies than the scaling techniques typically used to substantiate this ordering, the hierarchy is frequently found to be multidimensional and/or the ordering to be non-unique (e.g., see Lazardis et al. 1994; Thomas et al. 1998).

The ADL index was intended to measure an individual's ability to live independently. Thus, failure to be able to perform on any one of these tasks was originally considered sufficient to determine an individual to be "disabled." Obviously, the inability to perform one or more of these tasks greatly limits the ability to live independently. However, as evidence that social

factors intervene between impairment and disability, the development of special equipment to assist with these tasks (e.g., grab bars in showers, heightened toilet seats, walkers and canes, etc.) has enabled independent living for those who could not live independently without such equipment. Therefore, recent research has begun to focus on social differentials in access to equipment, like social class or race/ethnic differences (e.g., Agree 1999; Cornman and Freedman 2008).

A closely related set of measures that are commonly used in conjunction with ADL measures – indeed, they are sometimes combined with them – are Instrumental Activities of Daily Living measures (IADLs – Lawton and Brody 1969). IADLs are tasks that are more socially complex than ADLs and that make independent living easier, though they are not absolutely necessary for independent living. Often, these items are better at capturing cognitive impairment than physical impairment. For example, some common IADL measures include the ability to do laundry, to use the phone, to put together a grocery list (and shop), to manage money and to prepare meals. Each of these tasks has a significant cognitive component, in addition to the physical component; either cognitive or physical impairment may limit the ability to perform these tasks.

There is little agreement about the appropriateness of using IADLs for capturing disability and there is not a standard set of them used in contemporary demographic research. One problem with the use of IADLs is that, especially for older birth cohorts in the United States, the items have a strong gender bias. Many older men cannot do laundry or prepare meals but this is not the result of physical impairment. Instead, it is due to traditional gender roles in which men do not do laundry nor cook. A second problem with the use of IADLs, as suggested above, is that performing IADL activities may reflect cognitive impairment as much as, or more than, physical impairment. Cognitive impairment, while important in its own right, is distinct from physical impairment and so the validity of results involving IADL measures that are purported to reflect physical disability is suspect.

In addition to the several classes of measures used to reflect impairment/limitation and disability, studies structure the wording of their measures inconsistently. Some studies ask whether respondents can perform the activity without help. Some ask whether the respondent can perform the activity with help (from either a

person or device). Some ask whether the respondent actually performs the activity; some ask whether the respondent has difficulty with the activity; and some ask the respondent to demonstrate that she/he can perform the activity – especially the items that capture the ability to perform particular muscular tasks like lifting a bag or rising from a chair. As Glass (1998) discussed, these measurement differences may lead to differences in estimates of incidence and prevalence of disability in the population. Indeed, the bias across these different question wording approaches has been shown to be in the opposite direction for ADL versus IADL items (Bootsma-van der Wiel et al. 2001), which further calls into question the relatively frequent combined use of these two disability scales.

How ADL and IADL measures are used provides yet additional heterogeneity in the measurement of disability. Separate limitation, ADL, or IADL items are rarely used in disability research. Instead, given a set of limitations or disability measures, the measurement of disability is commonly reduced either by (1) using a dichotomous indicator reflecting whether respondents have indicated that they have at least one task they cannot perform or cannot perform without difficulty, or (2) using a count of tasks an individual cannot perform or cannot perform without difficulty. Often, it seems the type of model the researcher intends to run determines the measure chosen, rather than vice versa. For example, if the goal is to use multistate life table methods to produce estimates of active life expectancy, disability free life expectancy, or some other expectancy measure, the first measurement option is commonly used. On the other hand, if regression modeling is to be used, a count of limitations or disabilities is often used. Indeed, sometimes, a total count of both ADL and IADL limitations is used (see Spector and Fleishman 1998). Fortunately, recent evidence suggests that varying the number of ADL at which one sets the disability threshold – when using a dichotomous measure of disability – matters little in multistate life table applications, especially when using a threshold of 3 or more ADLs as the threshold distinguishing disabled from non-disabled (Lynch et al. 2003a).

A growing amount of attention has been paid to how disability is measured both in terms of question wording or format and in terms of consolidating measures. Yet there seems to be relatively little consensus on producing a single, common measure in future surveys nor on using a single, common measure in current

research. While much of the recent focus on measurement has concerned the effects of question wording or using a dichotomous versus count measure, an area that has been largely neglected in the literature is the consideration of measures that attempt to capture the severity of disability or limitation. Virtually all data that include ADLs/IADLs measure them ordinarily by capturing a range of difficulty for performing each task but most researchers dichotomize the response to each item before creating a summed index or an overall single indicator of limitation/disability. Additionally, little work has examined the role that special equipment and/or personal aid from a caregiver might affect measurement. Also, context should be taken into account more directly when considering measurement issues. For example, ADL impairments may be more likely to be reported in nursing home facilities than in community populations since, in the former context, reimbursement is based on the severity of residents' disabilities. For example, a person in a nursing facility who is slow at getting to the toilet may be classified as mobility impaired, whereas a community-dwelling person with the same capabilities would be classified as non-disabled.

Modeling of Disability

Just as there are a variety of measures of limitation and disability, there are a variety of modeling strategies that have been employed in research on the demography of disability. Contemporary research involves both macro and micro level data, where “macro” is defined as population level and “micro” is defined as individual level. Studies using macro level data typically involve the use of population level mortality rates and disability prevalence rates often obtained by aggregating micro level survey data into coarse categories. Such research most often uses Sullivan's method (1971) to obtain estimates of “active life expectancy,” “disability-free life expectancy,” or “healthy life expectancy,” where these terms represent the separation of total life expectancy – the expected length of life remaining – into years healthy and unhealthy. We discuss Sullivan's method below.

Research using micro level data, on the other hand, uses a variety of approaches to studying disability. In some cases, when panel data are available, multistate life tables are produced, also with the goal of estimating

healthy life expectancy. Generally speaking, however, when multistate life table methods are used, the data historically have been aggregated into relatively coarse categories in order to obtain large cell sizes for computing stable transition probabilities.

Most often, research using micro level data has involved some type of regression analysis in order to examine factors that differentiate individuals in terms of their propensities to be disabled or otherwise unhealthy. We discuss a variety of these modeling strategies below.

Recently, there has been an integration in these latter two approaches – the use of regression modeling in conjunction with multistate life table construction. In general, under this/these approaches, some type of event history regression modeling is used to produce smoothed transition probability matrices for individuals/subpopulations with particular profiles (e.g., married white men) and these transition probability matrices are then used as inputs for multistate life table estimation. We discuss this strategy below.

Macro-Level Studies and Sullivan's Method

Some studies in the demography of disability focus on disability incidence and prevalence rates and changes therein. However, contemporary studies predominantly

report summary measures such as healthy life expectancy. Such measures can be constructed using Sullivan's method applied to cross-sectional age-specific mortality and health prevalence data. Sullivan's method involves (1) constructing a basic, single-decrement life table and (2) applying age-specific health prevalence proportions to the person-years column to apportion years of life lived into healthy and unhealthy years.

The life table is the most basic method in the demographer's toolkit of methods and so we only briefly discuss its construction here (see Preston et al. 2000 for a more detailed discussion). The key input required for a standard period life table is a series of age-specific mortality rates observed in a given year. These rates are generally applied to a hypothetical cohort of a given size (the radix; usually 100,000) to obtain a count of deaths by year of age and these death counts can be subtracted year-by-year from the original cohort. The number of person-years lived in each age interval is then computed. Each individual who lives through an n -year age interval lives n person years in the interval and an assumption is made regarding how many person-years are lived in an age interval by persons who die during the interval. The most commonly-used assumption is the linear assumption, which is equivalent to stating that all decedents died in the middle of the age interval and so each decedent lived $n/2$ years. Once the person years have been computed, life expectancy – the number

Table 25.1 Sullivan life table

Basic life table					Sullivan's additions				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Age	$l(x)$	$q(x)$	$d(x)$	$L(x)$	$e(x)$	$p_h(x)$	$L_h(x)$	$e_h(x)$	$e_h(x)/e(x)$
50	93522	0.004	415.5	93314	30.4	0.893	83330	23.1	0.76
55	91113	0.007	606.3	90810	26.1	0.867	78732	19.2	0.73
60	87498	0.010	914.0	87041	22.1	0.829	72157	15.6	0.71
65	82131	0.016	1318.9	81472	18.3	0.803	65422	12.4	0.68
70	74561	0.025	1839.6	73641	14.9	0.766	56409	9.5	0.63
75	64244	0.038	2420.4	63034	11.9	0.706	44502	6.9	0.58
80	51037	0.059	3003.1	49535	9.3	0.630	31207	4.8	0.52
85	34959	0.097	3382.3	33268	7.5	0.528	17565	3.3	0.44
90+	18839	0.148	18839	127014	6.7	0.379	48138	2.6	0.38

Notes: This table is abbreviated, not abridged. Mortality probabilities ($q(x)$) are from 2000 U.S. vital statistics. Non-disabled probabilities are from the 2000 American Community Survey (ACS).

of years an individual can expect to live at a given age – is computed by summing the total number of remaining person years to be lived from the given age forward and then dividing by the number of persons alive at the beginning of the given age interval. The left half of Table 25.1 shows a basic life table for year 2000, using data from U.S. vital statistics. The table is abbreviated and not abridged, for the sake of space. Column 3 shows mortality probabilities within each single year age group and column 4 shows the count of expected deaths to the population that begins each age interval alive. Column 5 then shows the number of person years lived in the age interval using the linear method for computing person years (decedents are assumed to contribute $\frac{1}{2}$ person years each). The usual $T(x)$ column – the sum of all person years lived from age x forward – has been omitted to save space. Finally, column 6 shows the expectation of life at age x . It is the sum of all person years to be lived from age x forward divided by the number of persons alive at age x .

The right half of Table 25.1 shows the extension of the basic life table for Sullivan's method. Sullivan's method involves taking a set of age-specific disability (or non-disability) prevalence proportions and applying them to the person-years column of the basic life table to apportion person-years lived into healthy and unhealthy years. The 2000 American Community Survey (ACS) asked a single question regarding whether respondents had *any* physical limitation that restricted usual activity. Responses to this item were aggregated to produce the proportions shown in Column 7. These proportions were then applied to the $L(x)$ values in Column 5 to obtain an estimate of the number of person years lived non-disabled in each age interval (Column 8). Column 9 shows disability-free life expectancy, which is calculated just as total life expectancy is, only using the new $L_h(x)$ column. Finally, the proportion of remaining life to be spent non-disabled is shown in Column 10 (see Table 25.1).

Sullivan's method is a powerful tool for evaluating trends in disability-free life expectancy and to date, it has been employed perhaps more than any other in the demography of disability, because of its simplicity in construction and its minimal data requirements. As stated and shown above, the method requires only cross-sectional data and the mortality and health data may come from separate sources. The method is flexible in the sense that the health prevalence

proportions need not reflect a dichotomous variable. That is, the health outcome variable can be divided into multiple, ordinal (or even nominal) categories. Furthermore, the health prevalence proportions can be obtained from micro level survey data by aggregation, or they may be macro level proportions obtained from vital statistics or some other source.

Sullivan's method does suffer from some important limitations, however. One limitation is that it is not clear that the mathematical assumptions underlying it are reasonable in representing real individual-level processes. For example, given that the basic life table is produced first, it seems that a key assumption of the method is that the death rates for healthy and unhealthy people are equal. The method also assumes that individuals either do not transition between (alive) states within an age interval, or if they do, the transitions balance out to produce person-years in each state consistent with the assumption that they do not transition. We know each of these assumptions is generally untrue, yet research has repeatedly demonstrated that Sullivan's approach performs very well. One reason may be that typical applications of Sullivan's method use linear assumptions for computation of person years lived in each state and, under the linear assumption, it turns out that the aforementioned Sullivan's assumptions have no influence. Another reason may be that Sullivan's assumptions, like most demographic assumptions, are more problematic over broad age/time intervals but most research uses data with one year age/time intervals.

Another important limitation of Sullivan's method is that the original method is limited in its ability to produce estimates for subpopulations. Subpopulations are often restricted to age, sex and race, because this is the lowest level of disaggregation (at least in the U.S.) at which mortality data are typically reported. Additionally, given that health prevalence proportions are commonly obtained from relatively small surveys, such data can often only be aggregated into coarse categories that retain large enough cell sizes to produce stable estimates. This limitation makes Sullivan's method less useful for addressing more detailed hypotheses regarding heterogeneity of disability in the population. It is equally limiting for examining disability among the oldest old, where small cell sizes frequently result in the truncation of Sullivan life tables with an aggregated 85+ age category.

Micro-Level Studies and Regression-Based Analyzes

Micro level studies in the demography of disability come in two varieties. One type of micro level study involves the use of micro level data to produce actual transition probabilities for use as input for true multistate life table generation. Figure 25.3 shows the most commonly used state space in research involving multistate life table methods. Each path in this figure corresponds to an age-specific transition probability; these probabilities can be obtained directly from a two-wave panel study by simply observing the proportion of individuals at a given age who begin in each state and recording their ending states. Once a set of age-specific transition probability matrices is obtained, standard multistate calculations are applied to obtain multistate life tables (see Schoen 1988 for a more detailed discussion of multistate methods).

This type of research is similar to that which uses Sullivan's method in that the data are generally aggregated to a coarse level in order to obtain stable transition probabilities. Panel data sets are always smaller than national mortality rate files and are frequently smaller than cross-sectional surveys from which health prevalence rates are obtained for Sullivan's method. Therefore, a key limitation of Sullivan's method – the

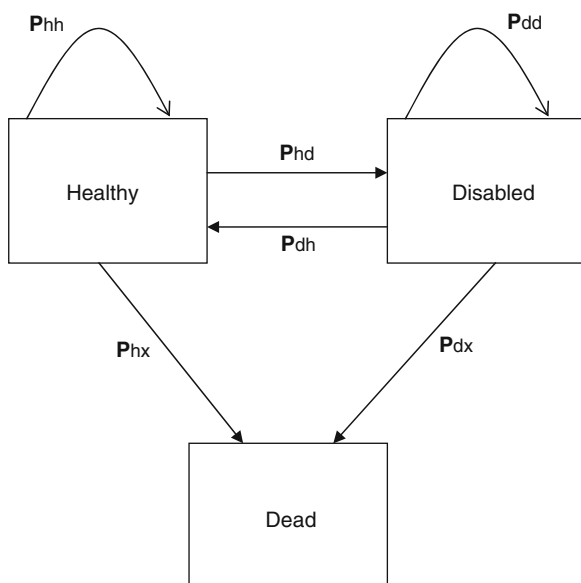


Fig. 25.3 Typical 3-state state space for multistate life table models

inability to produce state expectancy estimates for heterogeneous subpopulations including the oldest age groups – is even more applicable to studies using true multistate methods.

A second limitation to the use of panel data, for either multistate life table estimation or for regression based modeling as discussed below, is that many of the most common panel studies are now dated (e.g., the NHANES/NHEFS) and/or cover a very limited number of birth cohorts (e.g., the HRS/AHEAD). Yet, a consistent finding in the demography of disability is that disability rates and mortality rates have both fallen rapidly over the last four decades. Therefore, it is unclear whether results obtained using older panels and/or cohorts necessarily reflect the disability experience of younger cohorts as they age.

A second genre of micro level studies in the demography of disability involves the use of regression analyzes of survey data in order to address important sociological, psychological and gerontological hypotheses regarding heterogeneity in aging. Although as recently as 20 years ago such research would not have been considered true demography, the discipline of demography has expanded its focus over the last half century. Currently, documenting and understanding heterogeneity in the experience of disability and aging more generally has emerged to be perhaps more important than simply documenting large scale trends.

Research in this vein has often addressed specific hypotheses regarding disability that have been derived from sociological theories of inequality. For example, some research has examined whether a cumulative disadvantage process occurs across age such that the socioeconomic gap in disability increases at older ages. Other research in this vein on U.S. populations has focused on racial disparities in disability, examining hypotheses such as the double jeopardy hypothesis (see Ferraro 1987). Some research has adopted the focus of life course sociology and gerontology in attempting to understand how the process of disablement unfolds across age for individuals and factors that differentiate individuals' experiences.

Fundamentally, the primary limitation of the regression modeling approach is that regression coefficients have relatively little immediate implication for policy because the results are not generally interpretable in terms of their population level implications for health and mortality. In other words, whereas demographic concepts such as life expectancy at birth are easily

understood by policymakers, the large scale implications of regression coefficients are not. For example, while the policy implications of a traditional demographic finding that an average 65 year-old can expect to live about two-thirds of their remaining life non-disabled (see Table 25.1) are straightforward, a regression coefficient frequently requires considerably more policy translation.

Conjunction of Macro- and Micro-Level Research: Life Tables from Micro Studies

Recent work in the demography of disability has attempted to combine regression modeling strategies with life table methods to produce state expectancies for detailed subpopulations – like married black males in the U.S. with 12 years of schooling – while controlling on sociodemographic factors that differentiate subpopulations from one another but may not be of immediate interest in a given study – like regional variation. This work began with using hazard regression models to produce single decrement/basic life tables in the early 1970s. More recently, Land et al. (1994) showed how to use loglinear models to estimate smoothed transition probability matrices for use in multistate life table construction. The result was the ability to produce multistate life table estimates for very specific subpopulations (like the one mentioned above), even when cell sizes are too small to provide stable life table estimates if one were to use the usual technique of disaggregation and separate estimation. In a similar fashion, Manton and Stallard (1994) developed an approach that combined dynamic hazard regression modeling of individual level risk factors with complex measurement of disability using grade of membership analysis to produce detailed forecasts of active life expectancy.

A key limitation of these approaches, however, is that, while state expectancy estimates can be obtained for very specific subpopulations, such estimates cannot be compared across subpopulations to address hypotheses regarding between-group differences, because the standard errors of the state expectancy estimates cannot be directly computed. More recent research has attempted to remedy this problem. In 1999, Hayward et al. described a method involving the bootstrapping

of multivariate hazard model parameters and the production of multistate life tables for each bootstrap sample. The bootstrapping approach involves (1) taking repeated samples from the original data (“bootstrap samples”), (2) estimating a multivariate hazard model (e.g., a discrete time multinomial logit model) predicting transitions between states (e.g., healthy, unhealthy and deceased) for each bootstrap sample, (3) computing predicted/smoothed transition probability matrices from the results of these models for each sample after specifying a subpopulation for which to produce predicted values and (4) generating life tables from these transition probability matrices. The result is an empirical sampling distribution of life tables, the standard deviation of which can be used to quantify uncertainty in state expectancy estimates. Comparisons between subpopulations can then be made using t-tests and/or subsequent regression modeling of state expectancies.

A second approach in this vein, by Laditka and Wolf (1998) involved the estimation of a Markov regression model modeling transition probabilities. The parameter estimates from the model are then used to simulate life histories for a hypothetical cohort of individuals and confidence intervals are obtained from the collection of these life histories. Recent research has utilized this methodology through the IMACh (a Maximum Likelihood Computer Program using Interpolation of Markov Chains) software package developed by Lièvre, Brouard and Heathcote (2003). Under the approach developed by Lièvre, Brouard and Heathcote, standard errors for state expectancies are derived using the delta method. However, this implementation of the method is significantly restricted in the number of covariates that can be included in a model, which, similar to Sullivan’s method, limits work on detailed hypotheses regarding heterogeneity of disability in the population

Most recently, Lynch and Brown (2005) developed a Bayesian approach to regression modeling and multistate life table construction. First, a multivariate discrete time hazard model is developed. Samples of the parameters of these models are then generated using Gibbs sampling. Gibbs sampling is similar to bootstrapping but whereas bootstrapping involves resampling of the data to obtain an approximate sampling distribution for the model parameters, Gibbs sampling involves directly sampling the parameters from their “posterior distribution” (see Lynch 2007 for a general discussion of Gibbs sampling and its application to

life table estimation). Given a sample from the posterior distribution of the model parameters, transition probability matrices can be generated just as under the bootstrapping approach and multistate life table calculations can be carried out in the same fashion. This method overcomes limitations regarding the number of covariates that can be examined, thus allowing for very detailed analyses of heterogeneity in disability. However, due to the lack of a standardized software package and less experience with Bayesian statistical procedures among demographers, this method is not yet in widespread use.

Sociodemographic Differentials in Disability

Demographic analyses traditionally describe variations in subpopulations by presenting calculated life years, incidence and prevalence, transition rates, etc. broken down by age, gender and race/ethnicity. Indeed, these demographic variables, along with socioeconomic status, have been the foundation of much of the demographic research on disability over the past few decades. Here, we describe disability differentials that have been consistently found in the adult and older adult population of the United States.

Age is arguably the most basic demographic variable, since it allows the comparison of rates at different life stages and the comparison of populations with varying age structures. The U.S. Census (2000) collected data from individuals age 5 and above to determine the prevalence of disability encompassing physical, mental, sensory, self-care, etc. limitations. Among those age 5–15, 5.8 per cent report some disability. This number grows with age to 18.6 per cent among those 16–64 and 41.9 per cent among those 65 and older. As discussed previously, differences in the measurement of disability lead to inconsistencies in the rates of disability provided by varying data sources. Results from the National Long Term Care Survey (NLTC), the National Health Interview Survey (NHIS) and the Established Populations for Epidemiologic Studies of the Elderly (EPESE) placed the prevalence of ADL or IADL disability among those 65 and older at about 20 per cent in the late 1990s (see Leveille et al. 2000; Manton and Gu 2001; Schoeni, Freedman and Wallace 2001). This number increases with age, how-

ever, such that at age 80 for women and 85 for men, the percentage of disabled elderly increases from roughly 20 per cent to about half (Leveille et al. 2000).

One of the most recent debates in the demography of disability has been whether disability rates are declining among older adults. The debate regarding these trends (first reported by Manton et al. 1993) over the past two decades has been a heated one for scholars and has resulted in research contributions from multiple research traditions (see Freedman et al. 2004). Although now generally agreed upon by scholars, the magnitude of the decline in disability and whether it will continue are still under debate (Wolf et al. 2005). Furthermore, the underlying causes posed by scholars include changes in the rates of chronic disease, how disabling chronic conditions are compared to the past, the use of medical technology and other environmental changes for older adults, changes in the way “ability” and “disability” are socially constructed and defined and generally increasing socioeconomic status among older adults measured primarily through education (Crimmins 2004; Freedman and Martin 2000; Wolf et al. 2005).

Gender is also an important and sometimes perplexing variable in the demography of disability. Often called the “gender paradox” (Rieker and Bird 2005), women are more likely to experience morbidity and disability while at decreased risk of death compared to men. This finding is consistent across developed nations and suggests that both social and biological mechanisms are at work (Jagger et al. 2007; Peres et al. 2005). Previous findings on disability prevalence differentials may be both due to the fact that women have higher rates of disability and the fact that women’s increased life expectancy allows them to live to later ages when disability is most likely (Freedman et al. 2004). Various studies have also shown that women live with more severe disability compared to men (see Leveille et al. 2000) but findings vary on whether there are true differences in onset (Manton 1988; Schoeni et al. 2002).

Racial and ethnic disparities in disability are notable but more difficult to document consistently, especially at later ages. Blacks are at highest risk of all racial groups, living both the fewest years overall and the most years in poor health (Geronimus et al. 2001; Hayward and Heron 1999). A sizeable proportion of these racial differences is attributable to socioeconomic status differences between races, while

the remainder is often attributable to institutionalized and direct discrimination (see Hayward et al. 2000). Documenting and gaining a better understanding of these differences is the focus of a considerable body of contemporary research, especially given that racial disparities in disability among older adults widened during the 1980s (Clark 1997) and differentials in mortality are forecasted to increase (Levine et al. 2001). Yet, the study of racial differences in health is marred by data limitations, including race misreporting at time of death, errors in census counts, age misreporting and problems defining socioeconomic status across groups (Williams 2005).

In studying older adults, the issue of selective mortality is also highly problematic (see Vaupel et al. 1979). The black-white crossover in mortality has been debated as an artifact of age misreporting (Elo and Preston 1994) but has been found consistently across data sources with various methods of age calculation (see Dupre et al. 2006 for a recent review; Wing et al. 1985). According to a frailty argument, the least robust individuals are selected out of the population at younger ages, yielding decreased mortality, morbidity, or disability for the most robust survivors at the latest ages. Findings on racial disparities are often inconsistent at later ages due to selective mortality, especially for black/white differences (see Crimmins et al. 1996; Hayward and Heron 1999).

Finally, socioeconomic status (SES) is often studied in regard to disability differentials and is noted as an important factor in declining disability trends (Freedman and Martin 1999). A tremendous body of contemporary research has attempted to determine why SES influences disability specifically and health and mortality more generally. Although there is no entirely satisfactory answer to this question, it is clear that SES influences health care access, health behaviors, social capital, the experience of stress and responses to it and many other factors, all of which are related to health.

Education is the primary measure used to measure SES in demographic research because it is generally expected to be time invariant and temporally prior to health in later life (i.e., it is not endogenous to health in later life as is income). Although disability is agreed to be declining among older adults, the disparities by education seem to be widening (Schoeni et al. 2005), which may reflect growing socioeconomic inequality in the U.S. In studies where multiple indi-

cators of socioeconomic status are used, education is linked with lower prevalence of disability and has been shown to be most salient for the transition into disability over time (Melzer et al. 2001) where income has been shown to be protective in transitions within level of disability for adults (Taylor 2005; Zimmer and House 2003).

The pathways through which sociodemographic factors work to produce disability differences include producing an increased risk of disabling chronic conditions, increased vulnerability to disability given the same disabling conditions and decreased access to resources that may prevent, delay or reduce the amount of disability an individual accumulates (e.g., access to health care, assistive devices, or social support). Disadvantaged populations, such as racial minorities, are at higher risk of chronic conditions (Kelley-Moore and Ferraro 2004; Manton and Stallard 1997) and the health behaviors that foster or exacerbate those conditions (Bolen et al. 2000). There is also support for increased vulnerability to stress among disadvantaged groups, suggesting that poor health may be more disabling (Geronimus et al. 2001; George and Lynch 2003). The importance of neighborhood context and racism in fueling disparities has also gained notice in recent years in addition to individual behaviors (Jackson 2005; Williams 2004; Williams and Collins 2001). Finally, access to resources are lower among disadvantaged groups including access to preventive care or treatment, social support, or assistive devices making disabling chronic conditions easier to manage (Frist 2005; Rubin and White-Means 2001; Taylor 2006). However, recent research has shown that the use of assistive technologies for mobility impairment by racial and ethnic minorities is already proportional to underlying need, which questions whether equalizing technological accommodation of impairment might also equalize social disparities in disability (Cornman and Freedman 2008).

The social factors placing individuals at risk of increased disability are not mutually exclusive of one another, indeed, there is difficulty in teasing out the effects of race and socioeconomic status since these processes of disadvantage are so closely linked (Hummer 1996). Understanding the etiology and nature of risk for disadvantaged groups has been a challenge to researchers for decades and these processes will only become more important as more individuals survive to ages where disability becomes increasingly prevalent.

Contemporary Issues in the Demography of Disability

A consistent finding in the mortality demography literature has been that mortality rates at older ages have fallen drastically since the 1960s. To be sure, life expectancy increased consistently throughout the last century but much of the gains in life expectancy early in the century were due to reductions in infant and childhood mortality, in part via the epidemiologic transition – the transition in which chronic diseases have replaced acute diseases as the leading causes of death (see Omran 1971). From the 1960s to the present, additional gains in life expectancy have come about as a result of rapidly declining mortality rates for persons over 65. The virtual elimination of mortality prior to middle adulthood, along with the falling death rates in later adulthood has been called “the compression of mortality” and similarly, “the rectangularization of the survival curve.”

Coupled with this compression of mortality, most chronic disease rates and resulting disability rates have also declined, leading some to suggest a “second epidemiologic transition.” (e.g., Manton 1982). A key question that has emerged over the last three decades is: which is falling faster, age specific mortality rates or disability rates? The answer to that question determines whether individuals are spending the additional years of life afforded by declining mortality in a healthy or unhealthy state. In 1980, Fries argued that the life span was finite – that life expectancy would reach a maximum due to biological limits and that advances in medical science would continue to reduce chronic disease and disability rates, compressing morbidity against the life span limit. This “compression of morbidity” hypothesis has received considerable attention since 1980 but there has been little definitive conclusion reached regarding it, for a number of reasons. First, Fries’ assumption that there is a biological limit to the life span has no empirical basis: Life expectancy continues to increase linearly, if not faster, just as it has for more than a century (Oeppen and Vaupel 2002). Second, there has been increasing recognition that morbidity – especially disability – is not an absorbing state. That is, a significant proportion of older adults pass in and out of disabled states and so, the term “compression of morbidity” must be clarified. For instance, if individuals spend less total time disabled during their life course but periods of disability are increasingly spread across the older ages,

does this constitute compression of morbidity or expansion? Third, there is growing recognition that there is considerable subpopulation heterogeneity in mortality and disability, so that compression might occur for one group but not another in the population. Such a subgroup differentiation has already been noted regarding racial differences in mortality compression in the U.S. (Lynch et al. 2003b). Fourth, despite the fact that researchers in the demography of disability have been investigating this question for almost three decades, we still do not have the data needed to definitively answer the question, in part because the oldest birth cohorts in 1980 were not measured on disability prior to that time period. That is, most data sources on the health of older populations – at least in the U.S. – began in the 1980s and so there really is not a long enough span of data to conclusively determine whether compression of morbidity is occurring.

Demography of Disability in Other Developed Countries

While much demographic research on disability has been conducted using data from the United States, considerable comparative work has also examined disability around the globe. For example, the World Health Organization (WHO) compiled health-adjusted life expectancy data on 191 countries in 2000 (see Mathers et al. 2000). Such a comprehensive comparative assessment is extremely rare, however, due primarily to difficulty in obtaining accurate data from the most economically disadvantaged developing nations. Indeed, to fully calculate HLE across 191 nations, the authors of the WHO report were forced to use Bayesian statistical methods to estimate prevalences for the numerous countries in which no household surveys were conducted.¹

Complicating matters further are the multiple measures of disability used in comparative work. Disability-Adjusted Life Years (DALY’s) have been used by some researchers to examine health gaps within populations (see Murray et al. 2002). On the other

¹ The WHO Multi-country Household Survey Study on Health and Responsiveness was used only for 55 of the 191 countries. Estimates for the remaining nations were calculated using data from the Global Burden of Disease 2000 study (as “priors”) combined with “posterior” prevalences from the survey nations.

hand, Health-Adjusted Life Expectancy (HALE) and its predecessor, Disability-Adjusted Life Expectancy (DALE), have been used to directly compare expectancies across nations (e.g., Mathers et al. 2000). Alternatively, Disability-Free Life Expectancy (DFLE) has been used to compare OECD countries for several years (Robine et al. 1999). Additionally, normative and cultural differences in health and disability exacerbate problems of comparability across different countries even when similar survey instruments are used (see e.g., Murray et al. 2000; Robine et al. 1996; Romieu and Robine 1994; Sadana et al. 2000). Thus, considerable care must be taken when examining comparative disability research to ensure that comparable measures are used in prevalence calculations across the countries of interest.

Cross-national differences in healthy life are quite remarkable, with HALE at birth ranging from as little as 29.5 years to as much as 73.8 years (Mathers et al. 2000). While it is generally true that residents of more economically advantaged nations have longer average years to be lived healthy, this relationship is not perfectly monotonic. For example, some developing nations such as Malaysia and the Philippines have longer average HALE than seemingly more developed countries such as Russia. Mapping of HALE also shows clear regional patterns with the lowest HALE's found in sub-Saharan Africa where most people have an average expectation of less than 45 healthy years of life at birth and in central and southern Asia where many HALE at birth values are between 45 and 55 years. On the other hand, these expectations in Western Europe average 68 years or more and exceed 63 years in most of North America. These same regional patterns generally hold when examining HALE at age 60.

Still, aforementioned data limitations restrict this limited global work on disability to cross-sectional analyses and methodologies such as Sullivan's Method (1971). Comparative work using longitudinal data and multi-state analyses is generally limited to industrialized nations, especially the countries of Europe (with the U.S., Japan, Australia and New Zealand sometimes included). For example, Robine and colleagues (2005) have investigated trends in DFLE for 15 EU nations over the 1990s decade. Their results show considerable variability in LE and DFLE even among these comparably wealthy nations with a mixture of trends in DFLE. For example, DFLE for women at age 65 in 1991 ranged from as low as about 7 years in Finland to

as high as 12 years in Greece. Cross-sectional ordering, however, is not as telling as trend data in these cases. Whereas the lowest DFLE for women at age 65 remained around 7 years in Finland from 1991 to 2003, DFLE in Greece declined from 12 to about 10.5 years over the same period. Italy, on the other hand, experienced a rise in this same value from about 10.5 years in 1991 to almost 14 years by 2003. Given the variability in these trends among similarly developed nations, there is a clear need for improved longitudinal data from developing nations where levels and trends in disability are likely more volatile. While some noteworthy efforts are currently underway to remedy this lack of data (e.g., the SABE surveys in Latin America, see Pelaez et al. 2003), it will be sometime before a complete global picture of disability and disability trends is obtained.

Unfortunately, this lack of data has generally also resulted in little theoretical development to explain these cross-national differences. Indeed, even in developed nation studies with the best data, explanations of country level differences in disability trends are limited to idiosyncratic national characteristics or very general appeals to broad paradigms such as the epidemiologic transition. The infusion of theoretically-grounded explanation for these newly-noted comparative differences remains one of the most important challenges for demographers of disability.

Conclusions

In this chapter, we have compactly described the demography of disability, covering the dominant theoretical perspectives in the field, the contemporary measurement of disability and its shortcomings and the most common strategies used in research for modeling disability. In addition, we have discussed some of the empirical differentials in disability that have become increasingly studied over the last few decades. That is, while early research in the field focused predominantly on descriptive analyses of disability incidence and prevalence, contemporary research has been increasingly focused on heterogeneity in the experience of disability. In this process, investigators have learned a tremendous amount about the intervening variables/mediators in the latter half of the Verbrugge-Jette model from the physicality

of impairment through the social definition of disability. What remains is an in-depth understanding of the relationship between specific pathology (like type II diabetes) and impairment – and differentials therein – and that is the focus of a growing body of current research in the field.

References

- Agree EM (1999) The influence of personal care and assistive devices on the measurement of disability. *Soc Sci Med* 48:427–443
- Bolen JC, Rhodes L, Powell-Griner EE, Bland SD, Holtzman D (2000) State-specific prevalence of selected health behaviors, by race and ethnicity – behavioral risk factor surveillance system, 1997. *Morb Mortal Wkly Rep* 49:1–58
- Bootsma-van der Wiel A, Gussekloo J, de Craen AJ, van Exel E, Knook DL, Lagaay AM, Westendorp RG (2001) Disability in the oldest old: “can do” or “do do”? *J Am Geriatr Soc* 49:909–914
- Burkhauser RV, Daly MC, Houtenville AJ, Nargis N (2002) Self-reported work-limitation data: What they can and cannot tell us. *Demography* 39:541–555
- Clark DO (1997) U.S. trends in disability and institutionalization among older blacks and whites. *Am J Public Health* 87:438–442
- Cornman JC, Freedman VA (2008) Racial and ethnic disparities in mobility device use in late life. *J Gerontol: Soc Sci* 63B: S34–S41
- Crimmins EM (2004) Trends in the health of the elderly. *Annu Rev Public Health* 25:79–98
- Crimmins EM, Hayward MD, Saito Y (1996) Differentials in active life expectancy in the older population of the United States. *J Gerontol: Social Sci* 51:S111–S120
- Dupre ME, Franzese AT, Parrado EA (2006) Religious attendance and mortality: Implications for the black-white mortality crossover. *Demography* 43:141–164
- Elo IT, Preston SH (1994) Estimating African-American mortality from inaccurate data. *Demography* 31:427–458
- Ferraro KF (1987) Double jeopardy to health among black older adults? *J Gerontol* 42:528–533
- Freedman VA, Martin LG (1999) The role of education in explaining and forecasting trends in functional limitations among older Americans. *Am J Public Health* 88:1457–1462
- Freedman VA, Martin LG (2000) Contribution of chronic conditions to aggregate changes in old-age functioning. *Am J Public Health* 90:1755–1760
- Freedman VA, Martin LG, Schoeni RF (2004) Disability in America. *Popul Bull* 59(3):3–32
- Freedman VA, Crimmins E, Schoeni RF, Spillman BC, Aykan H, Kramarow EA, Land KC, Lubitz J (2004) Resolving inconsistencies in trends in old-age disability: Report from a technical working group. *Demography* 41(3):417–441
- Fries JF (1980) Ageing, natural death, and the compression of morbidity. *New Engl J Med* 303:130–135
- Frist WH (2005) Overcoming disparities in U.S. health care. *Health Aff* 24:445–451
- George L, Lynch SM (2003) Race differences in depressive symptoms: A dynamic perspective on stress exposure and vulnerability. *J Health and Soc Behav* 44(3):353–369
- Geronimus AT, Bound J, Waidmann TA, Colen CG, Steffick D (2001) Inequality in life expectancy, functional status, and active life expectancy across selected black and white populations in the United States. *Demography* 38:227–251
- Glass TA (1998) Conjugating the “tenses” of function: Discordance among hypothetical, experimental, and enacted function in older adults. *Gerontologist* 38:101–112
- Hayward MD, Heron M (1999) Racial inequality in active life among adult Americans. *Demography* 36: 77–91
- Hayward MD, Miles TP, Crimmins EM, Yang Y (2000) The significance of socioeconomic status in explaining the racial gap in chronic health conditions. *Am Sociol Rev* 65(6): 910–930
- Hayward MD, Rendall M, Crimmins EM (1999) Evaluating group differences in healthy life expectancy: The estimation of confidence intervals for multistate life table expectancies. Paper presented at the annual meeting of the Gerontological Society of America, San Francisco
- Hummer RA (1996) Black-white differences in health and mortality: A review and conceptual model. *Sociol Q* 37(1): 105–125
- Jackson P (2005) Health inequalities among minority populations. *J Gerontol: Soc Sci* 60B:63–67
- Jagger C, Matthews R, Melzer D, Matthews F, Brayne C, MRC CFAS. (2007) Educational differences in the dynamics of disability incidence, recovery and mortality: Findings from the MRC Cognitive Function and Ageing Study (MRC CFAS). *Int J Epidemiol* 36(2):358–365
- Katz S, Ford AB, Moskowitz RW, Jackson BA, Jaffe MW (1963) Studies of illness in the aged. The index of ADL: A standard measure of biological and psychosocial function. *J Am Med Assoc* 185: 914–919
- Kelley-Moore JA, Ferraro KF (2004) The black/white disability gap: Persistent inequality in later life? *J Gerontol: Soc Sci* 59B:S34–S43
- Kempen GI, Myers AM, Powell LE (1995) Hierarchical structure in ADL and IADL: Analytical assumptions and applications for clinicians and researchers. *J Clin Epidemiol* 48: 1299–305
- Laditka SB, Wolf DA (1998) New methods for analyzing active life expectancy. *J Aging Health* 10:214–241
- Land KC, Guralnik JM, Blazer DG (1994) Estimating increment-decrement life tables with multiple covariates from panel data: The case of active life expectancy. *Demography* 31:297–319
- Lawton MP, Brody EM (1969) Assessment of older people: Self-maintaining and instrumental activities of daily living. *Gerontologist* 9:179–186
- Lazardis EN, Rudberg MA, Furner SE, Cassel CK (1994) Do activities of daily living have a hierarchical structure? An analysis using the longitudinal study of aging. *J Gerontol* 49: m47–m51
- Leveille SG, Pennix BW, Melzer D, Izmirlian G, Guralnik JM (2000) Sex differences in the prevalence of mobility disability in old age: The dynamics of incidence, recovery, and mortality. *J Gerontol, Soc Sci* 55B:S41–S50
- Levine RS, Foster JE, Fullilove RE, Fullilove MT, Briggs NC, Hull PA, Husaini BA, Hennekens CH (2001) Black-White

- inequalities in mortality and life expectancy, 1993–1999: Implications for Healthy People 2010. *Public Health Rep* 116:474–483
- Lièvre A, Brouard N, Heathcote C (2003) Estimating health expectancies from cross-longitudinal surveys. *Math Popul Stud* 10:211–248
- Lincare JM, Heinemann AW, Wright BD, Granger CV, Hamilton BD (1994) The structure and stability of the functional independence measure. *Arch Phys Med Rehabil* 75:127–132
- Lynch SM (2007) Introduction to applied bayesian statistics and estimation for social scientists. Springer, New York
- Lynch SM, Brown JS (2005) A new approach to estimating life tables with covariates and constructing interval estimates of life table quantities. *Sociol Methodol* 35:177–225
- Lynch SM, Brown JS, Harmsen KG (2003a) The effect of altering ADL thresholds on active life expectancy estimates among older individuals. *J Gerontol: Soc Sci* 58B(3):S171–178
- Lynch SM, Brown JS, Harmsen KG (2003b) Black-White differences in mortality deceleration and compression and the mortality crossover reconsidered. *Res Aging* 25:456–483
- Manton KG (1988) A longitudinal study of functional change and mortality in the United States. *J Gerontol: Soc Sci* 43: S153–S161
- Manton, KG (1982) Changing concepts of morbidity and mortality in the elderly population. *Milbank Q* 60:183–244
- Manton KG, Corder LS, Stallard E (1993) Estimates of change in chronic disability and institutional incidence and prevalence rates in the U.S. elderly population from the 1982, 1984, and 1989 national long term care survey. *J Gerontol* 48(4):S153–S166
- Manton KG, Gu X (2001) Changes in the prevalence of chronic disability in the United States black and nonblack population above age 65 from 1982 to 1999. *PNAS* 98: 6354–6359
- Manton KG, Stallard E (1994) Medical demography: Interaction of disability dynamics and mortality. In Martin LG, Preston SH (eds) *Demography of aging*. National Academy Press, Washington, DC, pp 217–278
- Manton KG, Stallard E (1997) Health and disability differences among racial and ethnic groups. In: National Research Council, Martin LG, Soldo BJ (eds) *Racial and ethnic differences in the health of older Americans*. National Academy Press, Washington, DC, pp 48–104
- Mathers CD, Murray CJL, Lopez AD, Salomon JA, Sadana R, Tandon A, Ustün TB, Chatterji S (2000) Estimates of healthy life expectancy for 191 countries in 2000: methods and results. Global programme on evidence for healthy policy discussion Paper No. 38. World Health Organization
- Melzer D, Izmirlan G, Leveille SG, Guralnik JM (2001) Educational differences in the prevalence of mobility disability in old age: The dynamics of incidence, mortality, and recovery. *J Gerontol* 56:S294–S301
- Murray CJL, Salomon JA, Mathers CD, Lopez AD (eds) (2002) Summary measures of population health: concepts, ethics, measurement and applications. World Health Organization, Geneva
- Murray CJL, Tandon A, Salomon JA, Mathers CD (2000) Enhancing cross-population comparability of survey results. Geneva, World Health Organization (GPE Discussion Paper No. 35)
- Nagi SZ (1965) Some conceptual issues in disability and rehabilitation. In: Sussman MB (ed), *Sociology and rehabilitation*. American Sociological Association, Washington, DC, pp 100–113
- Nagi SZ (1976) An epidemiology of disability among adults in the United States. *Milbank Mem Fund Q/Health Soc* 54: 439–467
- Oeppen J, Vaupel JW (2002) Broken limits to life expectancy. *Science* 296:1029–1031
- Omran AR (1971) A Theory of the epidemiology of population change. *Milbank Mem Fund Q* 49:509–538
- O’Rand A (2001) Stratification and the life course. The forms of life course capital and their interrelationships. In: Binstock RH, George LK (eds) *Handbook of aging and the social sciences*, 5th ed. Academic Press, San Diego, pp 197–213
- Pelaez M, Palloni A, Albala C, Alfonso JC, Ham-Chande R, Hennis A, Lebrao ML, Leon-Diaz E, Pantelides A, Pratts O (2003) Survey on aging, health and wellbeing, 2000. Pan American Health Organization (PAHO), Washington, DC
- Pèrès K, Jagger C, Lièvre A, Barberger-Gateau P (2005) Disability-free life expectancy of older French people: Gender and education differentials from the PAQUID cohort. *Eur J Ageing* 2:225–233
- Preston SH, Heuveline P, Guillot M (2000) *Demography: measuring and modeling social processes*. Oxford: Blackwell
- Rieker PP, Bird CE (2005) Rethinking gender differences in health: Why we need to integrate social and biological perspectives. *J Gerontol Series B: Psychol Sci Soc Sci* 60: S40–S47
- Robine JM, Jagger C, Clavel A, Romieu I (2005) Disability-free life expectancy (DFLE) in EU countries from 1991 to 2003. EHEMU Technical Report 2005_1
- Robine JM, Mathers CD, Brouard N (1996) Trends and differentials in disability-free life expectancy: Concepts, methods and findings. In: Caselli G, Lopez A (eds) *Health and mortality among elderly populations*. Clarendon Press, Oxford, pp 182–201
- Robine JM, Romieu I, Cambois E (1999) Health expectancy indicators. *Bul World Health Organ* 77:181–185
- Romieu I, Robine JM (1994) World atlas of health expectancy calculations. In: Mathers C, McCallum J, Robine JM (eds) *Advances in health expectancies*. Australian Institute of Health and Welfare, Canberra
- Rubin RM, White-Means, SI (2001) Race, disability and assistive devices: Sociodemographics or discrimination. *Int J Soc Econ* 28:927–941
- Sadana R, Mathers C, Lopez AD, Murray CJL (2000) Comparative analysis of more than 50 household surveys on health status. Geneva, World Health Organization, 2000 (GPE Discussion Paper No. 15)
- Schoen R (1988) *Modeling multigroup populations*. Plenum, New York
- Schoeni RF, Freedman VA, Wallace R (2001) Persistent, consistent, widespread, and robust? Another look at recent trends in old age disability. *J Gerontol: Soc Sci* 56B(4): S206–S218
- Schoeni RF, Freedman VA, Wallace R (2002) Late-Life disability trajectories and socioeconomic status. *Annu Rev Gerontol Geriatr* 22:184–206
- Schoeni RF, Martin LG, Andreski PM, Freedman VA (2005) Persistent and growing socioeconomic disparities in disability among the elderly: 1982–2002 *Am J Public Health* 95:2065–2070

- Spector WD, Fleishman JA (1998) Combining activities of daily living with instrumental activities of daily living to measure functional disability. *J Gerontol, Soc Sci* 53B:S46–S57
- Sullivan DF (1971) A Single index of mortality and morbidity. *HMSHA Health Rep* 86:347–354
- Taylor MG (2005) Disaggregating disability trajectories: Exploring differences in the disability experience of older adults in the United States. Doctoral Thesis, Duke University
- Taylor MG (2006) Pathways linking socioeconomic status to disability among older adults: Disentangling transitions and trajectories. Paper presented at the Annual Meeting of the American Sociological Association, Montréal, QC
- Thomas VS, Rockwood K, McDowell I (1998) Multidimensionality in instrumental and basic activities of daily living. *J Clin Epidemiol* 51:315–21
- U. S. Census Bureau (2000) Census 2000, Summary File 3 Sample Data. Available at: http://factfinder.census.gov/servlet/ThematicMapFramesetServlet?_bm=y&_o_id=01000US&_tm_name=DEC_2000_SF3_U_M00257&ds_name=DEC_200_SF3_U&-_lang=en&-format=&-CONTEXT=tm
- Vaupel JW, Manton KG, Stallard E (1979) The impact of heterogeneity in individual frailty on the dynamics of mortality. *Demography* 16:439–454
- Verbrugge LM, Jette AM (1994) The disablement process. *Soc Sci Med* 38:1–14
- Williams DR (2004) Racism and Health. In: Whitfield KE (ed) *Closing the gap: improving the health of minority elders in the new millennium*. Gerontological Society of America, Washington DC, pp 69–80
- Williams DR (2005) The health of US. racial and ethnic populations. *J Geront, Soc Sci* 60B:53–62
- Williams DR, Collins C (2001) Racial residential segregation: A fundamental cause of racial disparities in health. *Public Health Rep* 116:404–416
- Wing S, Manton KG, Stallard E, Hames CG, Tryol HA, (1985) The Black/White mortality crossover: Investigation in a community-based study. *J Gerontol* 40:78–84
- Wolf D, Hunt K, Knickman J (2005) Perspectives on the recent decline in disability at older ages. *Milbank Q* 83(3):365–395
- World Health Organization (2002) *Towards a common language for functioning, disability and health*. Geneva: WHO
- Zimmer Z, House JS (2003) Education, income, and functional limitation transitions among American adults: Contrasting onset and progression. *Int J Epidemiol* 32:1089–1097

Chapter 26

Social Class, Health and Longevity

Pamela Herd

Introduction

Over the last century, life expectancy in the United States has steadily increased. Though much of this was due to falling infant mortality rates, older Americans have also experienced large increases in life expectancy. In 1950, those who survived to age 65 could expect to live to age 79; today, those who survive to age 65 can expect to live to age 84 (National Center for Health Statistics 2004). Moreover, though there was significant concern that rising life expectancy, particularly among the elderly, would simply mean that people were living many more years in worse health, current evidence belies this (Freedman et al. 2004; Fries 1980). In fact, age-specific disability rates have been falling among the elderly for the past 15 years (Freedman et al. 2004).

But with all the promise of longer and healthier lives among elderly Americans, this good fortune has not been distributed equally. Just as in the early and middle phases of the life course, there are large and persistent differences in health among the elderly by social class (defined in the medical sociology and social epidemiology literature as socioeconomic status) and some studies show these differences are growing (Goesling 2005; House et al. 1990; Schoeni et al. 2005). A life course shaped by unhealthy work and living environments takes an increasing toll on individuals as they move across the life course and into old age, making them more susceptible to ill health and early mortality.

P. Herd
University of Wisconsin–Madison
1180 Observatory Dr.
Madison, WI 53706, USA
E-mail: pherd@lafollette.wisc.edu

This chapter lays out the sources and explanations for socioeconomic disparities in health in old age. First, I will discuss a life course approach to studying health differences in old age by socioeconomic status, one that views socioeconomic status as a “fundamental cause” of health. Second, I will describe patterns of health by socioeconomic status in old age. Differences in health by socioeconomic status are largely consistent regardless of how socioeconomic status is defined (income, educational attainment, or occupation). Next, I will explore three debates regarding the sources of these late life socioeconomic disparities in health. First, are these differences present only at the bottom of the socioeconomic status distribution, reflecting material disadvantage, or are these differences present across the socioeconomic status distribution, reflecting the health consequences of status differences? Second, should research on socioeconomic status and health focus on understanding the pathways between socioeconomic status and health, or does this detract from understanding the root cause of these differences? Third, are socioeconomic health differences in old age driven more by early life experiences, or do later life experiences exert a more powerful impact? The last section of this chapter is devoted to debates over the causal relationship between socioeconomic status and health. In particular, to what extent might health drive stratification?

A Fundamental Cause and Life Course Approach

There are two interwoven theoretical frameworks that have shaped the sociological conceptualization of socioeconomic disparities in health in old age. The first

framework is the fundamental cause theory. In short, this theory argues that socioeconomic factors are not simply correlates of health status but are fundamental causes of health status (House et al. 1990; Link and Phelan 1995). Over the past 30 years sociologists and epidemiologists documenting the consistent and inverse relationship between socioeconomic status and measures of both morbidity and mortality across the life course, across countries and across time, began to challenge the notion that socioeconomic position was simply a proxy for other factors that negatively affect health, such as access to health care, sedentary lifestyles, smoking and obesity (Adler et al. 1994; House et al. 1994; Lantz et al. 1998; Link and Phelan 1995).

Key evidence supporting fundamental cause theory is that while the intervening links between socioeconomic status and health have changed across time, the link between low socioeconomic status and poor health has not changed. For example, while the major causes of mortality have changed over the course of the twentieth century, from infectious disease to chronic conditions, socioeconomic disparities in health have either persisted or increased (Link and Phelan 1995; Pappas et al. 1993). Further, the strong link between socioeconomic status and health persists across countries with vastly different social, political and economic institutions (World Health Organization 2006). Finally, as will be explored in this chapter, these differences also persist across the life course, even as risk factors for disease and mortality change (Herd 2006; House et al. 1990). For example, even as old age is increasingly characterized by increased life expectancy and declining disability, these advantages have not been randomly distributed across socioeconomic groups (Goesling 2005; House et al. 1990; Schoeni et al. 2005).

In addition to fundamental cause theory, research on health inequalities in old age commonly uses a life course perspective. In this framework, aging is a “lifelong process, a dynamic process embedded in social pathways and structures” (Elder and Johnson 2002; Uhlenberg 1996). A key aspect of the sociological life course framework is the role that institutions and social structures play in shaping and mediating individual choices and outcomes across the life course (O’Rand and Henretta 1999; Hooyman and Gonyea 1995; Estes 2001). Researchers who study old age in a life course framework understand it as a period significantly shaped by early and mid life experiences,

which in turn were shaped by earlier institutional and structural constraints.

Health in old age and particularly health inequality is increasingly conceptualized using this life course framework. Everything from poverty in childhood, to one’s work environment in mid life, has a profound impact on health in old age. Research has repeatedly demonstrated that old age health cannot be understood outside of the greater context of the entire life (Barker et al. 1989–1993; Wadsworth and Kuh 1997). However, there are many debates as to precisely how this process works, some of which will be touched upon in this chapter. For example, are health inequalities in old age driven primarily by disadvantage in childhood or by accumulated disadvantage across the entire life course (Ross and Wu 1996)? But the basic point is that health disparities in old age cannot be understood without linking them to people’s experiences in early and mid life.

The key link between a sociological life course perspective and fundamental cause theory is that structural factors, rather than individual choices and behaviors, drive differences in health outcomes in old age. Thus, as I explore throughout the chapter what links low socioeconomic status to poor health outcomes and mortality throughout the life course, I accept a key assumption embedded in this perspective. This assumption is that the route to ameliorating or weakening the link between socioeconomic status and health is through the redistribution of resources (income and educational attainment), what fundamental cause theorists label upstream factors, rather than through tackling intermediary factors, such as obesity and smoking, what fundamental cause theorists label downstream factors (House et al. 1990; Link and Phelan 1995).

Defining Socioeconomic Status

Throughout this chapter I primarily focus on socioeconomic status as defined by educational attainment and financial resources, though I will also include some discussion of occupational attainment. There are two main rationales for this approach. First, I focus heavily on U.S. research, where the most common measures of socioeconomic status are education and income. This differs from European studies, where measures of

Table 26.1 Adjusted odds of all cause mortality among those aged 45 and older, panel study of income dynamics, 1972–1989

5 year average annual household income, 1993	Odds ratios	95 per cent confidence Interval
Less than \$ 15,000	3.03	2.20, 4.11
\$15,000–20,000	2.49	1.89, 3.27
\$20,001–30,000	2.00	1.49, 2.68
\$30,001–50,000	1.45	1.11, 1.85
\$50,001–70,000	1.30	.95, 1.92
Greater than \$70,000	1.00	

Source: McDonough et al. 1997

social class are primarily occupational status (House 2002). Second, though I discuss how occupation may drive later life outcomes, most older adults are no longer working. Thus, the effects of occupational attainment are largely from prior periods in their life course.

It is also important to note, however, that these different facets of socioeconomic status likely have different impacts on various health outcomes (Herd et al. 2007). Education, income and occupational attainment almost certainly exert differential effects. To date, however, most studies use these measures as interchangeable, in part because they are all strongly correlated with health outcomes. Thus, for example, while I suggest some ways that income impacts health differently than education, our current state of knowledge about how these things matter differentially is somewhat limited.

Socioeconomic Differences in Health in Old Age

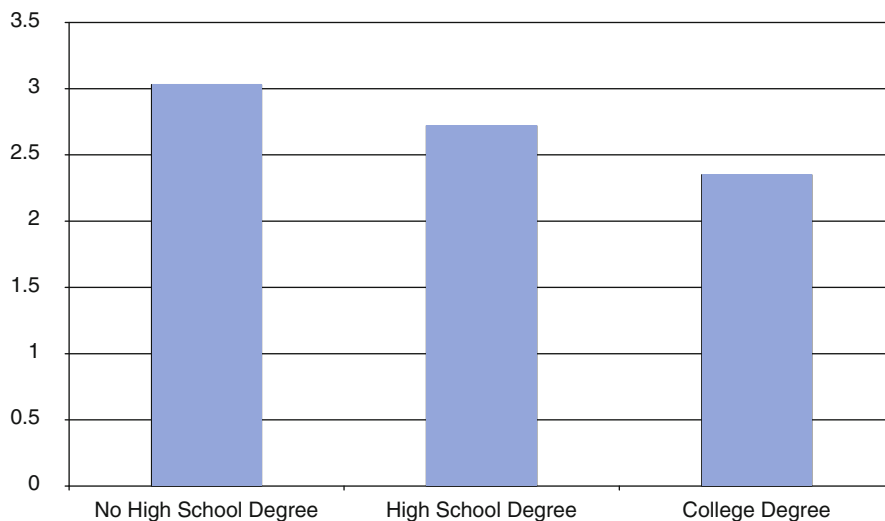
Regardless of how it is defined, there are large differences in health among older Americans by socioeconomic status. First and foremost, those with lower incomes and lower educational attainment are less likely to reach old age. Among those aged 25–64, the odds of mortality were about 50 per cent greater for those without a high school degree compared to those with a college degree (Backlund et al. 1999). In this age range, every increase in income by \$1000 up to \$22,500 was associated with a much larger mortality decline than similar increases in income above \$22,500 (Backlund et al. 1999).

This higher probability of mortality associated with lower socioeconomic status continues into late

life. Among those aged 65 and over, Manton and colleagues (1997) estimated that men with 8 or more years of education lived 2 years longer than those with less than 8 years. For women, the gap was 7.6 years. Table 26.1 shows mortality analyses for those aged 45 and over using the Panel Study of Income Dynamics between 1972 and 1989. The odds of mortality were significantly higher for those with low compared to high incomes. Among those with less than \$15,000 in average annual income over a five year period, their odds of mortality were three times that of people with incomes over \$70,000 (McDonough et al. 1997). Older individuals also face mortality risks related to prior occupational conditions. Moore and Hayward (1990) demonstrated that working in an occupation with limited complexity of tasks, more physical demands and environmentally unsafe workplaces led to higher mortality rates among men in old age. The evidence is less clear for elderly women in terms of prior occupation on health outcomes (Bassuk et al. 2002). This is likely due to limited labor force participation on the part of older women. Research in the coming decades will need to pay closer attention to how occupation affects women's health in late life.

Older individuals with low socioeconomic status face not only higher risks of mortality but also face higher risks of morbidity (House et al. 1990; House et al. 1994; Luo and Waite 2005). First, they are likely to have more chronic conditions. Figure 26.1 displays the average number of chronic conditions, by educational attainment, controlling for age, race and sex among those aged 65 and over in the 2005 National Health Interview Study. Of a total of eight different chronic conditions measured in this survey (hypertensions, diabetes, arthritis, heart disease, asthma, emphysema, stroke and cancer), those without a high school degree had an average of just over 3 conditions,

Fig. 26.1 Average number of chronic conditions among those aged 65 and over, by educational attainment

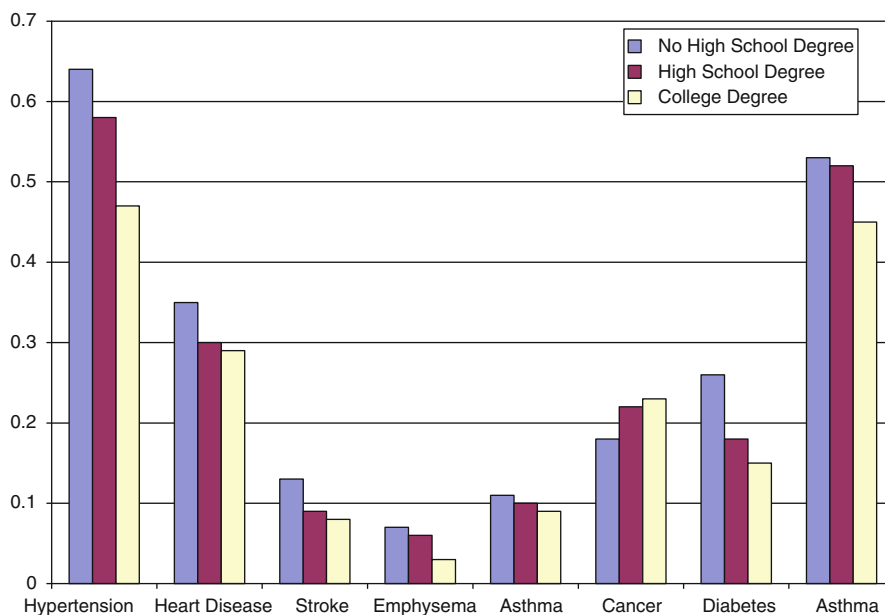


Source: National Health Interview Study, 2005, Author's Calculations.

while those with a college degree had 2.3 conditions. Figure 26.2 shows the breakdown by types of chronic conditions by education, controlling for age, race and sex. Across all categories, with the exception of cancer, those with lower educational attainment have higher probabilities of having the chronic condition. Further, it is important to point out that the differences across educational levels are likely underestimated because those with low educational attainment are more likely to underreport their chronic conditions (Mackenbach et al. 1996).

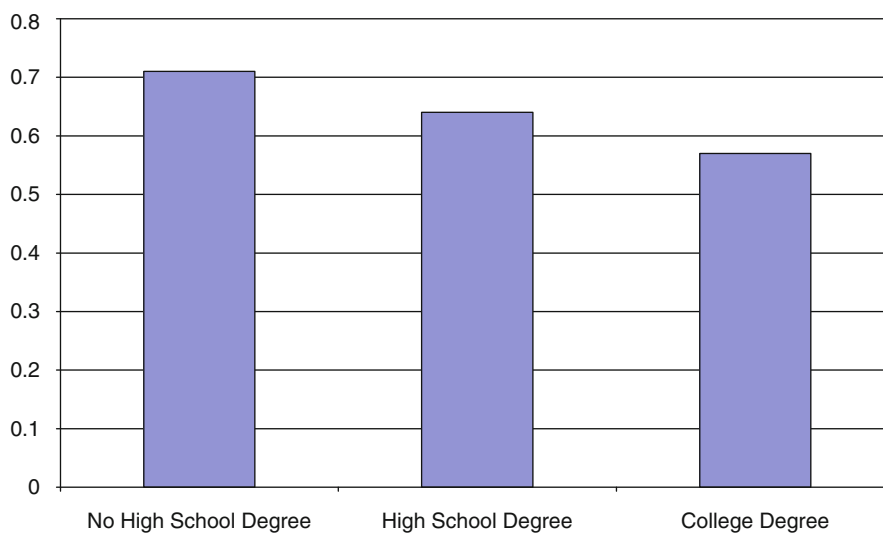
Those with lower socioeconomic status are also more likely to have functional limitations resulting from their ill health (Manton et al. 1997; Herd 2006; Lou and Waite 2005). Measuring functional limitations and not just specific disease outcomes is important because it conveys how ill health is affecting the ability of individuals to interact in the social world. Further, it gives a sense of the severity of ill health. Two individuals may have diabetes but if one's diabetes is better controlled it is less likely to lead to blindness or limb loss. Indeed, there is evidence that even

Fig. 26.2 Proportion of those aged 65 and older with chronic conditions, by educational attainment



Source: National Health Interview Study, 2005, Author's Calculations.

Fig. 26.3 Proportion of those aged 65 and older with functional limitations, by educational attainment



Source: National Health Interview Study, 2005, Author's Calculations.

among those with the same numbers of chronic conditions, those with low socioeconomic status have more functional limitations (Herd et al. 2007). Figure 26.3 shows the proportion reporting a functional limitation by educational attainment among those aged 65 and older, controlling for age, race and sex. Among those with college degrees, 56 per cent report having a functional limitation, compared to 71 per cent among those without a high school degree.

Those with lower socioeconomic status are also more likely to need assistance if they do report functional limitations. Among those aged 50–69 who died within the preceding year and who reported an activity limitation, 51 per cent of those with less than 8 years of educational attainment had needed personal care compared to 41 per cent of those with 12 or more years of educational attainment (Liao et al. 1999).

Socioeconomic status is also correlated with poorer mental health and cognitive impairment (Luo and Waite 2005; Miech et al. 2005). Among those aged 51–61 in 1992 who experienced an involuntary job loss, those with low wealth were more likely to be depressed 8 years later but those with high assets were not (Gallo et al. 2006). Among elderly Americans aged 70 and older in the AHEAD survey, those with low educational attainment were significantly more likely to have poor cognitive functioning (including memory, working memory, language, knowledge and orientation) than those with high educational attainment. A

similar relationship existed between wealth and cognitive functioning (Cagney and Lauderdale 2002).

Finally, those with low socioeconomic status are also less likely to recover when they experience ill health. Those aged 70 and older and with less than 8 years of education, compared to those with 12 or more years of education, were 1.4 times more likely to have a poor recovery 6 months after hospitalization controlling for a host of baseline health characteristics, including cognitive measures (Chaudhry et al. 2004).

There is also evidence that those with low socioeconomic status are not benefiting from general improvements in health and longevity among the elderly. As life expectancy among elderly Americans grew over the past 30 years there developed increasing concern that we would live longer but not necessarily better. In short, longer years of life might be dominated by more health problems and disability (Fries 1980). Conversely, others argued that lengthening life spans would be accompanied by a morbidity compression (Fries 1980). In other words, we might live longer and better lives.

As survey data tracking morbidity outcomes among the elderly became increasingly available throughout the 1980s and 1990s, it appeared that trends better supported the compression of morbidity theories. Though findings in the 1980s were mixed, starting in the mid 1990s, elderly Americans reported declines of between 1 and 2.5 per cent a year in activities of daily living limitations (including activities such as

eating, dressing and bathing). Similar declines were found for the per cent of elderly persons reporting that they received help for these activities. Finally, the proportion of elderly Americans reporting that they used equipment but not personal care, to bathe dropped from between 2 and 4 per cent a year (Freedman et al. 2004).

But while older Americans were generally living longer and healthier lives, these trends were not distributed randomly across the elderly population (House et al. 1994, 2005). Robert Schoeni and colleagues (2005) used data from the National Health Interview Study from 1982 to 2002 to measure how changes in morbidity over time were patterned by educational attainment and income. They employed two disability outcomes. The first measured whether individuals had any problem meeting their personal care needs, such as dressing, bathing or eating. The second measure encapsulated whether individuals had any difficulty with either personal care needs or instrumental activities of daily living, such as paying one's bills or doing shopping errands.

Though all socioeconomic groups experienced some improvements in these measures across time, the rate of decline was much higher and more consistent for those with higher incomes and educational attainment. For example, those with 16 or more years of education had declines of 2.5 per cent per year, while those with less than 9 years of education had declines of only 0.9 per cent. In terms of personal care limitations, those with low socioeconomic status had increases in needs over time, while those with high socioeconomic status had declines in needs over time. Those with 16 or more years of education experienced a 1.4 per cent decline, while those with less than 9 years of education had a 0.8 per cent increase. The results using income status paralleled the results for educational attainment.

Debates Over the Sources of Socioeconomic Disparities in Health in Old Age

The previous section made clear that there are large differences in health among older Americans by socioeconomic status. But what are the sources of these

late life socioeconomic disparities in health? I will examine three central debates in the literature regarding what drives these differences in health. First, are these differences present only at the bottom of the socioeconomic status distribution, reflecting material disadvantage, or are these differences present across the socioeconomic status distribution, reflecting the health consequences of status differences? Second, should research on socioeconomic status and health focus on understanding the pathways between socioeconomic status and health, or does this focus detract from understanding the root cause of these differences? Third, to what extent are health differences in old age driven by early life experiences?

Threshold Effects or Gradients?

There are two different perspectives on the nature of the relationship between socioeconomic status and health. One perspective holds that the relationship is largely about deprivation; there is a threshold effect. In short, those with low socioeconomic status suffer severe material disadvantages. Income and assets, as a component of socioeconomic status clearly drive these disadvantages. Poor people have difficulty meeting basic needs such as good nutrition and safe and healthy home and work environments, which are imperative to good health (Adler et al. 1994; Stokols 1992; Williams and Collins 1995). For example, poor children are more likely to report food insufficiencies and are more likely to be iron deficient (Alaimo et al. 2001). People with limited incomes must often skimp on more costly fruits, vegetables and generally fresh foods. Moreover, they are more likely to live in violent and polluted neighborhoods and have worked in jobs where noxious chemicals and physically grueling tasks undermine their health.

Generally, studies find that a substantial part of the relationship between low incomes and health can be explained by deprivation – individuals reporting they could not afford basic amenities such as housing, food and clothing (Stronks et al. 1998). Further evidence to support the threshold relationship has largely focused on the relationship between income and health. Past research has consistently found a nonlinear relationship between income and health; the relationship is strongest for those at the bottom of the income distri-

bution (Backlund et al. 1996; McDonough et al. 1997; Wolfson et al. 1993). For example, Backlund et al. (1999) found that the association between income and mortality was almost exclusively for those earning less than \$22,500 a year. This also holds true for morbidity outcomes (Lantz et al. 1998).

One commonly cited material disadvantage in the U.S. regards the lack of health insurance for many poor Americans, which adversely affects access to and quality of health care. But of course this is largely not an issue for elderly Americans because Medicare covers nearly all older Americans. Moreover, though there is some evidence that recent expansions of Medicaid have improved health outcomes in poor children and their mothers, there is little evidence that universal health care would substantially reduce socioeconomic status disparities in health (Currie and Grogger 2002). Health insurance and health care probably account for just 10–20 per cent of the relationship (McGinnis et al. 2002). Perhaps the most telling evidence that universal health care cannot eliminate socioeconomic status disparities in health is remaining socioeconomic disparities in health among elderly Americans, despite universal access to health care through Medicare. Even more strikingly, this is the case across all other developed nations that have universal health care systems. The most commonly cited study is the Black report in the United Kingdom, which found that after the implementation of a universal health care system, not only did social class differences in health not dissipate, they may have expanded.

The second perspective on the relationship between socioeconomic status and health challenges the idea that the relationship is largely driven by material disadvantage (Adler and Ostrove 1999). Many researchers argue that it is not just deprivation that drives the relationship between socioeconomic status and health but that it is about status differences. One line of evidence supporting this perspective is the relationship between income inequality and health. Countries with the highest levels of income inequality, controlling for income levels, have higher morbidity and mortality rates. This is also the case within the United States across states (Kawachi and Kennedy 1999; Lynch et al. 2004). These studies are somewhat inconclusive, however, because they are not able to demonstrate these findings across time within countries and states (Mellor and Milyo 2001).

Some of the most decisive studies on the effect of status on health have come out of the British Whitehall studies. Since the 1960s, British researchers have been conducting longitudinal research on British civil servants. Civil servant jobs, even those at the bottom of the occupational hierarchy, are considered good jobs in the overall occupational distribution, as measured by their pay, benefits and work conditions. The jobs exclude both the wealthiest and the poorest individuals. A 25 year follow up mortality study of these civil servants produced striking findings. There were measurable differences in health and mortality for different employment grades among this relatively homogenous group. For example, among men aged 45–64, those in the lowest employment grade had a 4 times greater risk of mortality than those in the highest grade (Marmot 1999).

Aside from survey designs, recent research using biomarkers has begun testing these status hypotheses on animals and even more recently on humans. Studies of hierarchies within adult baboons reveal that low status baboons have worse health outcomes than high status baboons (Sapolsky 1993). Michael Marmot pointed out that the differences in HDL cholesterol levels in high status and low status baboons looks similar to HDL cholesterol levels in high status and low status British civil servants (Marmot 1999). More recent studies have tried to replicate the experimental baboon studies on humans. Preliminary evidence indicates that imposed status hierarchies in humans are linked to physiological outcomes (Mendelson 2006).

Proximate Risk Factors and Fundamental Causes

Proximate Risk Factors

Much recent work focused on understanding the relationship between socioeconomic status and health has centered on “proximate” risk factors. These risk factors include both psychosocial factors and behavioral factors. The key link between these proximate risk factors and health is that they serve as intervening mechanisms between fundamental social causes (i.e., socioeconomic status or race) and actual health and mortality outcomes. But as I discuss at the end of this

section, there are limitations in focusing research on these proximate risk factors (House et al. 1990; Link and Phelan 1995).

The study of proximate psychosocial risk factors has dominated recent epidemiological and sociological research. Socioeconomic status is correlated with a range of psychosocial risk factors which, in turn, are predictive of health (House and Williams 2000). First, socioeconomic status is highly correlated with social supports and social supports are strongly predictive of both health and mortality (House et al. 1988; Turner and Noh 1988; Turner and Marino 1994). Those who are married, have lots of friends and participate in many outside groups (from churches to volunteer organizations) are more likely to be healthier and live longer (House et al. 1988). It should be noted, though, that while marriage is good for men's health, it is less clear that it is beneficial for women's health (Umberson and Williams 2005). But having adequate social support is also linked to socioeconomic status. Those with lower income and educational attainment tend to be more socially isolated (House et al. 1988; Turner and Noh 1988; Turner and Marino 1994). It is important to note, however, that while social supports can be viewed as an intervening mechanism between socioeconomic status and health, they also can be viewed as a fundamental cause in its own right (Link and Phelan 1995).

Another major mechanism linking socioeconomic status to health is stress, which plays a significant role in the onset of disease (Adler et al. 1994; Byrne and Whyte 1980; Cohen et al. 1993; Hayward et al. 1997; Lantz et al. 2005). In particular, individuals with low socioeconomic status are more vulnerable to undesirable and stress-producing life events, such as job loss, large financial losses, separation and divorce, widowhood and deaths of loved ones (Lantz et al. 2005; McLeod and Kessler 1990; Turner Wheaton, and Lloyd 1995). They also experience more chronic stress at home and work.

Stress can be induced by daily life events. The struggle to pay for the costs of food and shelter for family members induces significant stress and depression (Ross and Huber 1985). Violence and crime in poor urban areas generates fear and stress on a daily basis for those who cannot afford to leave these neighborhoods (Robert 1998; Ross and Mirowsky 2001). Not only are low-income individuals exposed to more stressful events, the impact of those events is much higher than it is for upper-income individuals because

they have fewer resources to manage them (Kessler 1979; Kessler and Neighbors 1986). Ultimately, more resources can mitigate many of these life stressors (Hayward et al. 1997).

Further, occupational studies have established the role that work environment plays in creating stress. Jobs characterized by repetitive action, high demands and limited control lead to higher stress levels, which in turn lead to worse mortality and health outcomes (de Jonge et al. 2000; Marmot et al. 1999). For example, older men who had worked in these kinds of jobs have higher mortality rates (Moore and Hayward 1990). Further, this kind of job strain can produce coronary disease and high blood pressure (Bobak et al. 1998; Marmot et al. 1999; Kompier and Cooper 1999; Schnall et al. 1994). There is also evidence that job pressures and conflicts can negatively affect mortality and morbidity (House 1974; House et al. 1986; Moore and Hayward 1990). Factors like job insecurity, repetitive work, work over which individuals have little control and hazardous and generally uncomfortable working conditions are connected to poor self-rated health and even coronary heart disease (Borg and Kristensen 2000; Bosma et al. 1997; Moore and Hayward 1990). A study in Sweden found that physical working conditions are the most significant explanatory variable in explaining socioeconomic differences in physical health (Lundberg 1991). Aside from emotional stress, it is not difficult to imagine how many low-income jobs, which involve significant physical stress, may negatively affect health over time (Case and Deaton 2004). Standing on your feet all day, lifting heavy objects (or people in the case of health care workers) and generally physically grueling work, over time negatively affect health. Indeed, about 9,000 workers become disabled on the job, 17 sustain fatal injuries in the workplace and 137 die from diseases related to their work every day (NORA 2001).

Another important psychosocial resource linking socioeconomic status to health is sense of control. Sense of control involves whether individuals feel they control the events in their lives. Those with a limited sense of control feel that their lives and what happens to them are out of their hands – it is luck, fate or chance that determines events in their lives (Ross and Wu 1995; Ross and Mirowsky 2003). In contrast, those with high levels of control feel that they determine the events in their lives – they control their environment rather than the other way around

(Ross and Wu 1995; Ross and Mirowsky 2003). Many studies find that sense of control is an important moderator of the effects of socioeconomic status on health (Ross and Mirowsky 2003). A recent study by Bosma and colleagues (2005) found that among those aged 57 and older, just 4 per cent of socioeconomic differences in heart disease were caused by classic risk factors (i.e., smoking, hypertension), while 30 per cent of these differences were accounted for by a sense of control.

Hostility, cynicism and anger are traits more common among those with low socioeconomic status and these are also predictive of poor health (Rodin 1986; Rowe and Kahn 1987; House et al. 1994; House and Williams 2000; Iribarren et al. 2005; Smith et al. 2004; Wen et al. 2006). These personality traits involve an “enduring, negative attitude toward others involving cognitive, affective and behavioral components” (Christensen et al. 2004: 572). These factors are linked to both poor health behaviors and specific negative health outcomes, including coronary heart disease and mortality (Christensen et al. 2004). Further, high hostility levels and depressive symptoms exacerbate social isolation, which in turn negatively impacts health (Williams and House 1985; Miech and Shananhan 2000).

Cognitive factors as an explanation for the link between socioeconomic status and health has been receiving more interest recently. In essence, does being smarter make one healthier? The cognitive impact of education, for example, might play an important role in helping individuals “manage” their disease. Dana Goldman and James Smith (2002) found that education predicts how well patients followed prescribed HIV drug regimes and diabetes insulin regimes and hypothesized that higher levels of education improved patients’ ability to follow complicated procedures necessary to manage and control both HIV and diabetes. There is even evidence that IQ differences, measured in childhood, drive long run health and mortality outcomes (Batty and Deary 2004).

One of the most cited explanations for socioeconomic differences in health is behavioral factors. Individuals with lower socioeconomic status are more likely to smoke, to be obese, to exercise less and to drink excessively (Lantz et al. 1998). Smoking is linked to cancer, heart disease and respiratory disease (Lantz et al. 1998). Obesity is strongly linked to a range of poor health outcomes, from diabetes to heart disease (Lantz et al. 1998). There is evidence

that people with low incomes do not eat well, consuming fewer fresh fruits and vegetables and more starchy filling foods (Townsend et al. 1992). Obesity, through both its relationship to disease and its impact on joints, also increases functional limitations leading to higher rates of disability. Tightly linked to obesity is more limited physical activity among those with low socioeconomic status (Lantz et al. 1998). In terms of alcohol use, those with low socioeconomic status are both more likely to drink too much or not to drink at all (Lantz et al. 1998). Though the evidence is still inconclusive, neither abstaining nor drinking too heavily is linked to better health outcomes (Ross and Mirowsky 2003). Moderate drinking is related to best health outcomes.

Although there is enormous public, media and increasingly policy attention focused on the behavioral factors discussed above, they account for a relatively small portion of the relationship between socioeconomic status and health. Studies find they account for just one-third of the relationship (Lantz et al. 1998).

Socioeconomic Status as a Fundamental Cause

Fundamental cause theorists caution that focusing research too heavily on these proximate risk factors undermines our understanding of the fundamental causes that shape the distribution of those risks (Link and Phelan 1995). Further, focusing on these proximate risks is a problematic long-term strategy towards reducing disparities in health. Proximate risk factors are constantly changing. What does not change, however, is the link between resources and health and mortality outcomes, regardless of the intervening mechanisms.

Focusing on health behaviors is one example of the problematic nature of concentrating attention on proximate causes. Most press and popular attention focus on obesity, smoking and exercise as the route to improving general population health as well as reducing disparities in health. But this ignores the context in which risky behaviors emerge. These behaviors may be adaptive for those with low socioeconomic status. For example, stress may induce coping mechanisms that are bad for people’s health. There is evidence that high levels of stress induce smoking, drinking and drug use (Selye 1956; House 1981; McGrath 1970). There is also evidence that individuals consume high

levels of starchy high cholerics foods, which tend to have little nutritional value, to deal with chronic stress (Dallman et al. 2003). Qualitative data generally support the hypothesis that these behaviors are adaptive for those with low socioeconomic status.

Of course, material disadvantage may also drive these behavioral differences. Healthy foods, such as fresh fruits, vegetables and whole grains, cost more than highly processed foods with little nutritional value. In terms of exercise, meeting federal guidelines of an hour a day may be challenging for those with low socioeconomic status for a variety of reasons. For example, one's neighborhood may preclude taking walks or running due to violence or crime and gym memberships may be unaffordable (Lenthe et al. 2005). The research on these explanations is still somewhat limited, particularly in terms of neighborhood factors but there is growing interest in exploring structural explanations for individual behaviors.

Moreover, new behavioral risk factors emerge as old risky behaviors are squashed. For example, malnutrition drove many socioeconomic disparities in health throughout much of the 20th century but currently obesity poses a much greater risk. The recent preponderance of highly processed, highly cholerics food, which is cheap but has little nutritional value, in part, has driven the trend of increasing obesity. Thus, there is a certain irony in that the War on Poverty in the 1960s, which focused on malnutrition, is gradually being replaced by a war on obesity. But the broader link to both malnutrition and obesity is socioeconomic status.

The stress model and psychological mechanisms, such as sense of control, provide additional examples of the dangers of focusing on intervening mechanisms. As Link and Phelan (1995) argued, though the original focus of stress models were linked to socioeconomic differences in health, most of the research has lost sight of the original motivation and increasingly focuses just on the links between stress and health. But, of course, stress is socially patterned, in large part by socioeconomic status (Lantz et al. 2005). Further, measures that capture sense of control or self efficacy, if not contextualized based on one's socioeconomic position, can be problematic. In fact, it is very difficult to improve someone's sense of control over their life without improving the very resources that allow individuals to exert greater control over their lives.

Finally, a key point that fundamental cause theorists emphasize is that regardless of the mechanisms, socioeconomic disparities in health have existed across time even as changing intervening mechanisms are targeted. For the elderly this is particularly striking. Even as life expectancy increased, access to medical care increased through the implementation of Medicare and the quality of medical care increased dramatically over the past 30 years, disparities in health among the elderly remain and even appear to be growing (Schoeni et al. 2005; Goesling 2005).

Early Life Factors, the Life Course and Cumulative Effects

In addition to fundamental cause theory, the life course perspective has contributed to our understanding of socioeconomic disparities in health in old age. As way of understanding late life disparities, researchers began looking at earlier experiences in the life course for clues. There are three different perspectives on the role that early life experiences play in determining socioeconomic patterns of health in old age. The first perspective is that childhood socioeconomic status is only important because it determines adult socioeconomic status, which in turn drives health outcomes. The second perspective is that socioeconomic status in childhood is the key driver of late life health outcomes. In this model, resources in adulthood cannot compensate for limited resources in childhood in terms of determining health outcomes. The third perspective is that early and midlife experiences interact to drive late life disparities in health.

There is evidence that childhood experiences, independent of experiences in adulthood, have long lasting effects on health. First, poverty in childhood has strong impacts on childhood health outcomes. Case et al. (2002) found large impacts of parental income on childhood health (measured as self-reported health status, number of days spent in bed due to illness, number of days that health restricted normal activities, the number of hospital episodes and number of school days missed due to illness) using both cross-sectional and longitudinal studies. They were able to rule out health at birth, genetic factors, parental health and health insurance as explanations for the income effects. Furthermore, the income disparities in health widened as children aged. These findings were partic-

ularly striking given the limited variation in childhood health. Infants with parents who have low socioeconomic status are also more likely to have been born with low birth weight, which itself has long lasting impacts on health throughout the life course (Conley et al. 2003).

But more importantly for this discussion, there is evidence that health problems in childhood, which are linked to low socioeconomic status, have long-run impacts on health in old age. For example, Holland et al. (2000) found that among those who had chronic health conditions in childhood, those with a father who did manual labor had higher probabilities of having chronic conditions in late life compared to those whose fathers did not do manual labor. Much of this research goes back to an even earlier stage of the life course and focuses on socioeconomic status and health in utero and infancy. The Barker hypothesis, laid out in work by Barker and his colleagues in the late 1980s and early 1990s, argued that nearly all sources of later life disparities in health could be found in fetal and infant Barker et al. 1989, 1991–1993). In particular, poor maternal health, which itself is often a product of poverty, led to an in utero environment that impeded infant development. These childhood antecedents of ill health may not emerge until much later in life. In essence, this unhealthy in utero environment led to biological programming of ill health. Further, there is significant research devoted to the long-term health effects of low birth weight, common among low socioeconomic status families, on diseases ranging from diabetes to heart disease (Frankel et al. 1996; Newsome et al. 2003). In conclusion, many studies find that childhood socioeconomic status exerts an independent effect on health above and beyond adult socioeconomic status (Poultan et al. 2002; Wamala et al. 2001).

But how important is childhood socioeconomic status relative to adult socioeconomic status? There are debates over the extent to which socioeconomic status in adulthood compensates for poverty driven ill health in childhood. Pensola and Martikainen (2003) found that although having a parent who was a manual laborer, compared to a parent who was not a manual laborer, is a predictor of later life mortality, it is not as a strong predictor as to whether or not the individual did manual labor in adulthood. In essence, adult socioeconomic status was a more important predictor than childhood socioeconomic status. Wamala and colleagues (2001) came to the

same conclusion when examining coronary heart disease in late life; adult socioeconomic status was a stronger predictor than childhood status. There are also studies that find a similar result when studying cognitive functioning in later life; upward social mobility in adulthood lead to improved cognitive mobility (Turrell et al. 2002).

Contrastingly, other studies find that effects of negative factors in childhood cannot be compensated for in adulthood. A study of physicians found that those with low socioeconomic status in childhood, compared to those with high status, were 2.4 times more likely to develop cardiac disease (Kittleson et al. 2006). In a study of almost 12,000 British women, social class status in adulthood did not offset the effects of social class in childhood in determining mortality outcomes (Power et al. 2005).

In general then, findings are decidedly mixed, with some studies finding adult socioeconomic status a more important predictor and other studies finding childhood socioeconomic status a more important predictor (Frankel et al. 1996; Huxley et al. 2002; Parsons et al. 1999; Poultan et al. 2002; Turrell et al. 2002; Wadsworth and Kuh 1997). One key distinction in terms of the importance of childhood appears to be at what age in adulthood the effects of childhood are considered. For example, Poultan and colleagues (2002) measured adult health at age 26 and found a very pronounced effect of childhood socioeconomic conditions on health, whereas Pensola and Martikainen (2003) measured adult health, via mortality, at ages 30–42 and found a much greater effect of adulthood socioeconomic status on health.

The third perspective on how health and socioeconomic status interact across the life course is that the longer one's exposure to low socioeconomic status, the worse one's health outcomes. This perspective is derived from cumulative disadvantage theory. Cumulative disadvantage theory posits that health inequalities should compound and grow as people age (Herd 2006; Lynch 2003; Ross and Wu 1996). Unhealthy work conditions, poor living environments, high levels of stress and general economic deprivation that persists should take a mounting toll on individual's health, leading to a gradual compounding and worsening of health problems as people age.

What is the evidence supporting the cumulative disadvantage theory of health outcomes? One set of evidence is derived from studies that look at the inter-

active effects of having low socioeconomic status measures. For example, Diex Roux et al. (2002) found that risk for developing hypertension increases when interacting a variety of low status measures. Those with low incomes and low educational attainment were at a greater risk of onset than those with only low educational attainment. Lawlor et al. (2005) found that there was a cumulative risk for heart disease among women aged 60–79 years of age. The more socioeconomic status risk factors they had, the more likely they were to develop coronary heart disease.

Another approach to testing cumulative disadvantage theory focuses on the duration of low socioeconomic status. Studies have found that the duration of poverty matters for health; the longer the poverty spell, the worse is its effect on ones' health (Lynch et al. 1997). Compared to those in the 1984 Panel Study of Income Dynamics who reported no poverty spells over the prior 16 years, those who reported transient poverty had self-reported health scores (excellent, very good, good, fair or poor) that were 17 per cent lower and those who had reported persistent poverty had self-reported health scores that were 32 per cent lower (McDonough and Berglund 2003). Data from the Whitehall studies also provide support for cumulative disadvantage theory. They show that more periods of the life course spent in low socioeconomic positions were correlated with poorer physical functioning, although this cumulative effect was not present for mental health outcomes (Singh-Manoux et al. 2004).

Finally, one last set of studies focuses on how the relationship between socioeconomic status and health changes people age. The basic argument is that if health inequalities accumulate, differences in health by socioeconomic status should consistently widen as individuals move across the life course. Indeed, from birth up until age 60, studies consistently find widening socioeconomic differences in health, measured by both morbidity and mortality (Beckett 2000; Herd 2006; House et al. 1990; Ross and Wu 1996). In short, as individuals move across the life course the gaps in health between those with high socioeconomic status and those with low socioeconomic status get bigger. This supports cumulative disadvantage theory. While many of these studies were conducted on cross-sectional data, the findings also hold in studies that use longitudinal data (Beckett 2000; Deaton and Paxson 1998; House et al. 1994; Kitigawa and

Hauser 1973; Kunst and Mackenbach 1994; Mustard et al. 1997).

But past age 60, particularly in U.S. studies, the evidence for cumulative disadvantage is more mixed. A few studies find widening health inequalities throughout old age. Ross and Wu (1996), using both cross-sectional and longitudinal data sets (although only a two wave one year gap study), found increasing educational differences in physical functioning, physical well-being and self reported health across the life course. Aneshensel et al. (1984) reported similar findings, although their old age group was comprised of people aged 45 and over, which is likely too broad an age sample to detect possible diminishing health inequalities. Miech and Shanahan (2000) found that depression disparities widen across as people age. Studies outside of the U.S. are even more likely to find that health inequalities continue to widen well into old age. For example, in Scotland, Hart and colleagues (1998) found widening (by occupational class in Scotland) mortality gap in adulthood and a study in Canada produced similar findings (Prus 2005).

Most studies in the U.S., however, have found that social class health inequalities peak around age 60 and start to weaken thereafter. This holds true for both morbidity and mortality (Becket 2000; Deaton and Paxson 1998; Herd 2006; House et al. 1994; Kitigawa and Hauser 1973; Kunst and Mackenbach 1994; Mustard et al. 1997). Data sets employed to demonstrate this trend include cross-sectional data, such as the National Health Interview Study and longitudinal data including the Panel Study of Income Dynamics, the American Changing Lives Study and the Health and Retirement Study.

How can these findings of declining socioeconomic health inequalities in old age be explained? One set of explanations emphasizes methodological problems with the studies that find converging health by socioeconomic status (Ross and Mirowsky 2003; Lynch 2003). Cohort effects could be driving the convergence. Using both replicated cross-sections of the National Health Interview Survey and the longitudinal National Health Epidemiologic Follow-up Study, Lynch (2003) demonstrated that cohort differences in education have been increasing over time. His results show that educational differences in self reported health are much larger among younger cohorts than they are among older cohorts. But in a study following a single cohort over time, Herd (2006) found that edu-

cational differences in functional limitations did begin to weaken after age 62.

The second methodological explanation is that declining health inequalities are due to mortality selection. People with lower socioeconomic status are more likely to die at younger ages, potentially leaving behind a more robust group of low socioeconomic status survivors relative to high socioeconomic status survivors (Becket 2000; House et al. 1994; Lynch 2003; Noymer 2001). Thus, health disparities look like they have diminished in old age, because the sickest people at low educational levels have died, leaving a biased sample of relatively healthier persons among those with limited educational attainment. But studies testing mortality selection explanations find little evidence that this is driving declining socioeconomic differences in health in old age (Beckett 2000; Herd 2006).

A second set of explanations focuses on the interaction of biological and social factors and is linked to the notion that the compression of morbidity is a phenomenon concentrated among those with high socioeconomic status. In short, people with high socioeconomic status are catching up to those with low socioeconomic status because those with high socioeconomic status can postpone health decline for only so long (Herd 2006; House et al. 1994; Beckett 2000). Indeed, there is evidence that, over time, those with high educational attainment have postponed the onset of poor health to later ages (the compression of morbidity), while those with low educational attainment have not (Crimmins and Saito 2001). Looking within a single cohort over time, Herd (2006) found a pattern by which those with high educational attainment have a rapid acceleration of health decline past age 60, compared to rates of health decline in their 50s. In contrast, those with low educational attainment have rapid acceleration of health decline in their 50s, followed by slower health declines in their 60s.

A final alternative explanation for declining health inequalities in late life, given less attention than the first two, derives from fundamental cause theory. This perspective argues that shifting resources is the way to explain declining health inequalities in late life. Retirement, which generally occurs to people in their 60s in the United States, leads to some shifts in resources. It is precisely in this phase of life when most studies start to see diminishing health inequalities. Both retirement and a massive old age welfare state alter the social context of older Americans, particularly for those at the bottom rung of the socio-

economic status ladder. In general, studies show that while income inequality remains high among older Americans, poverty and extreme economic hardship is lowest among this age group. Social Security is likely the reason for the improved status of the most disadvantaged in late life (Mirowsky and Ross 1999). Given that the effects of income on health in the U.S. are generally concentrated to those at the bottom of the distribution, this decrease in late life poverty would imply that changes in social context could lead to changes in their health.

It is possible that the interactive effects of retirement, Social Security and Medicare slow down health deterioration for those with low socioeconomic status. People in occupations that have been damaging to their health can exit the labor force, be guaranteed a stable source of income through Social Security (and to some degree pensions) and receive universal health insurance through Medicare. Studies show that manual labor and more generally occupations dominated by those with limited educational attainment, have consistently negative effects on peoples' health (Case and Deaton 2004). Furthermore, Social Security guarantees many people, who had volatile incomes through their working lives, a steady source of income in old age. This protects them against income loss, which has a negative effect on health (Herd et al. 2008). Poverty and especially extreme poverty, is less common among elderly individuals due to Social Security, Supplemental Security Income and Medicare (Mirowsky and Ross 1999). Given the nonlinear relationship between financial resources and health, it could be policies such as Social Security and Supplemental Income Security that provide an income floor for elderly Americans and offer health protection. Also, older Americans are guaranteed health insurance for the first time in their lives.

So what evidence is there to support the premise that declining health inequalities in old age may be a product of the redistribution of resources? There is a small but growing body of research on possible health consequences of income support policies in old age. There have been a handful of studies that directly estimate the causal effects of income support policies on the health of the elderly. These studies have been done both in the United States and in other countries. I will review both sets of studies, starting with studies that were conducted in Mexico and South Africa. I then focus on the United States

and the health effects of Social Security and the Supplemental Security Income program (SSI), a means tested policy that increases incomes of the poorest elderly Americans.

International Evidence

There have been a few promising studies in developing countries, though the extent of their applicability to the developed world is arguable. Under an income support experiment titled PROGRESSA, the Mexican government has been providing about \$800 million in aid to 2.6 million rural families, almost one-third of all rural families, since 1997. The program has certain conditions that families must meet in order to obtain aid. Families must seek preventative health care, children up to age five must have their growth monitored in clinic visits and mothers must receive prenatal care and receive health education counseling. Additional income supplements were also available if school age children attend school. Finally, the income was distributed directly to mothers, an important distinction in a patriarchal culture (Gertler 2000).

The results showed striking improvements in health for children, adults and those over age 50 who were in the program. Those over age 50, whose only requirement for participation was a yearly preventative health check up, had significant reductions in activity limitations due to illness, fewer days bedridden due to sickness and generally an increase in energy levels as measured by their ability to walk distances without significant fatigue. Children and adults also showed improved health outcomes. But it could not be proven that income had an independent effect on the children's health, due to the medical care requirements linked to the receipt of income benefits. Because of its success, the program is now being generalized to urban Mexico and is also being adopted by Argentina, Columbia, Honduras and Nicaragua.

Another study, though not an experimental one, looked at the effects of increasing the pension income of black South Africans to a level comparable to that of whites. Recipients of these pensions had more than twice the median per capita income of other black South Africans. Case (2004) found that in households that pooled income into a common household fund, the receipt of pension income was positively connected to the self reported health status of all household members and to the height of children. In households that

did not pool income, however, the relationship between receipt of pension and health status was only correlated for the pensioner. In general, the pension led to a half point increase in health, on a scale ranging from 1–5. The health improvements appeared to be a product of better nutrition, better living environments and less stress, all of which resulted from higher incomes.

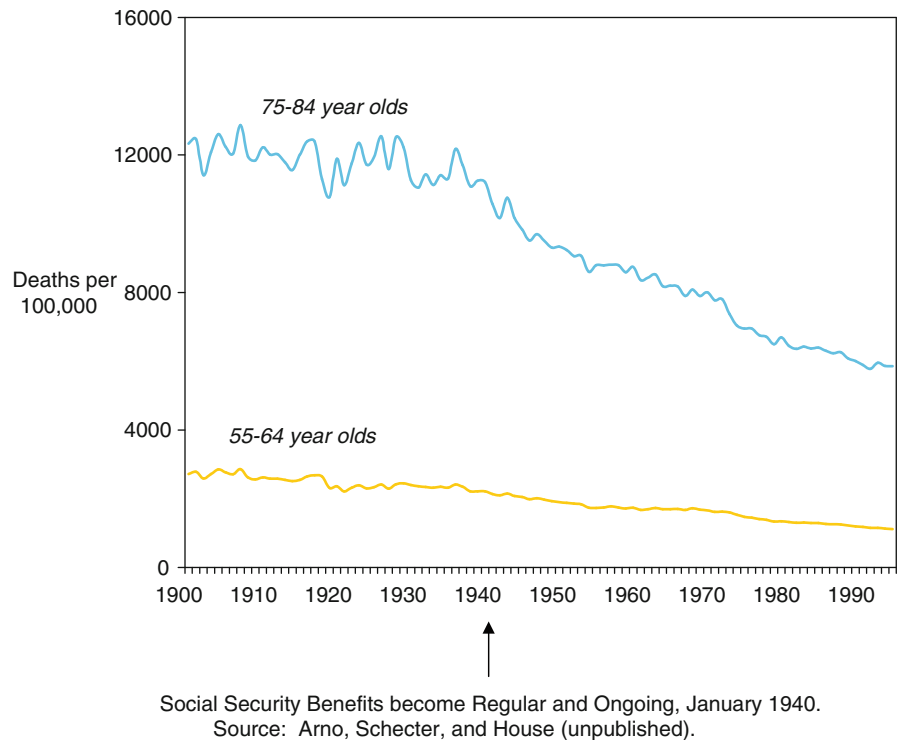
United States: Social Security and the Supplemental Security Income

The most obvious income support to examine for older people in the United States is Social Security, given the magnitude of the program's effect on incomes. In particular, Social Security has been remarkably effective at reducing poverty rates among the elderly. Between 1960 and 2005 the elderly poverty rate dropped from almost 30–10 per cent, a drop that is largely attributable to rising Social Security benefits (Engelhardt and Gruber 2004). But it is very difficult to estimate whether Social Security affects health. Simply examining whether those with higher Social Security benefits have better health will not indicate whether Social Security benefits improve health because Social Security benefits are based on individual's prior earnings, which may have been negatively affected by prior health problems.

Nonetheless, taking into account the long-term effects of Social Security on poverty rates among the elderly, ongoing work by Peter Arno, Clyde Schechter and James House has sought to detect a health impact of Social Security by examining the mortality experience of different adult age groups over the twentieth century. The hypothesis is that two large positive exogenous shocks from Social Security to the income of the elderly occurred over this period. The first followed its inception in the late 1930s and early 1940s and the second occurred after Social Security benefits were indexed to inflation during the 1960s and early 1970s (first *de facto* and then *de jure*). These changes should have produced discontinuous acceleration of rates of mortality decline in the health of the elderly (aged 65–74 and 75–84) but not adult age groups below age 65, in the 10–15 years following these changes.

Visual inspection of mortality trend lines in Fig. 26.4 show the basic pattern after the implementation of Social Security. There is a dramatic fall in mortality for those aged 75–84 compared to basically no change for those aged 55–64. The significance of this

Fig. 26.4 Mortality trends and the implementation of social security



pattern is confirmed by statistical tests for the change in slopes for the 15 years before and after 1940 and then again before and after 1970. However, these differences are not so clear or significant if mortality is logged to adjust for the very different average rates of mortality across age groups. Even if the differences are clearly sustained by more refined analysis, the greater improvement in older age mortality could also be due to the introduction of antibiotics in the 1935–1955 period and of Medicare in the 1965–1985 period. Nevertheless, the pattern shown by these aggregate data are consistent with a potentially positive impact on health of the poverty reduction and income expansion produced by Social Security for the older population.

While Social Security may have had an important impact on health, it is very difficult to design a study that can produce unbiased estimates of Social Security's effect today, if ever, because of the program's near universality and because an individual's health affects when he or she begins to receive Social Security benefits. SSI, though more limited in the population affected and in its total impact on income, has some advantages for testing the effects of income supports on health. A key advantage is that SSI is targeted at the poorest elderly Americans (though the blind and disabled under age 65 are also

eligible) and past research suggests that income supports that raise the incomes of the very poorest should have the largest health effects (Backlund et al. 1996).

SSI was implemented in 1974, though it actually evolved out of the Old Age Assistance (OAA) in the original 1935 Social Security Act. From the late 1930s through the mid 1950s, OAA was a much larger income support than Social Security, in the early phase providing upwards to 30 per cent of the income of elderly Americans. But OAA benefits varied across states, with some states providing very generous benefits and others providing few, if any, benefits. In 1974 Congress stepped in and established SSI, which provides a federal minimum income guarantee for people over age 65.

The first study to examine the health effects of SSI looked at whether the implementation of the program had any effect on health. Taubman and Sickles (1983) used the Retirement History Survey to examine how the health of elderly recipients changed after they started receiving SSI. In this survey individuals reported how their health compared to those of similar aged persons – better, the same or worse. They found that SSI had a positive impact on the health of elderly beneficiaries. The health of individuals eligible for SSI previous to implementation was statistically significantly worse than the

health of those not eligible. In both 1975 and 1977 – after SSI was implemented – the difference in health was no longer significantly different between these two groups. There are a few problems with this study, however. First, declining differences in health may have been due to mortality selection – SSI recipients may have reflected a more robust group of survivors. Also, SSI eligibility guaranteed access to Medicaid as a supplement to Medicare. Thus, improved health may have been due to receiving Medicaid, not SSI.

Work by Herd et al. (2008) seeks to build on Taubman's work, given both its promise and pitfalls, with an alternative empirical design to test whether SSI impacts health. Instead of testing whether the implementation of SSI has an effect on health, they tested whether variation in SSI maximum benefits over time within states predicts changes in health. Though there is a federal maximum SSI benefit, states can supplement the federal benefit. The federal minimum benefit is set around three-quarters of the poverty line and, as with Social Security benefits, the minimum SSI benefit is adjusted annually to account for inflation. In 2000, the federal monthly income minimum was \$532 for single individuals and \$789 for married couples.¹ In 1990 and 2000, 25 and 27 states, respectively, supplemented the federal benefit. Thus, we ask whether within state changes in maximum SSI benefits over time are correlated with within state changes in disability. We found that increases in the maximum state SSI benefit are correlated with reductions in disability rates among the elderly (Herd et al. 2008).

New Directions

Most of this chapter has focused on socioeconomic status as a predictor of health and mortality but it is also plausible that health predicts socioeconomic status. There has been increasing research devoted to sorting out the causal pathways that run between

socioeconomic status and health. In short, is poor health a source of socioeconomic stratification? I will examine the evidence regarding the effects of health on educational attainment and income. There is little or no evidence regarding the effects of health on occupational choices.

If health affects educational attainment, this effect should be largely confined to childhood and early adulthood. Is there evidence that poor health in childhood limits educational attainment, thus meaning that educational differences in health in old age are largely driven by health differences in childhood? There is some evidence that this is the case. Anne Case and colleagues (2005), employing data from a birth cohort in the United Kingdom that was followed from birth into middle age, found that poor childhood health predicted lower educational attainment and lower socioeconomic status in adulthood. Rucker Johnson and Robert Schoeni (2006), using the Panel Study of Income Dynamics, which also tracked individuals from birth to adulthood, found that poor health, in particular low birth weight, had a negative impact on both educational attainment and earnings in adulthood. The negative effects of poor health for educational attainment, however, were confined to high school completion. It is also important to keep in mind that the sources of childhood ill health appear often to be rooted in limited family resources and general low socioeconomic status (Case et al. 2002).

Despite this evidence, there is little doubt that education exerts a causal impact on health. Even after accounting for childhood health, studies find an independent effect of education on health into late life (Hayward and Gorman 2004). Another way the independent causal effects of education on health have been demonstrated is through studies using quasi experimental designs. Adriana Lleras-Muney (2005) employed the implementation of mandatory schooling laws, which varied by state and time, to test for an exogenous impact of increased educational attainment on health. Indeed, she found that mandatory schooling laws increased educational attainment, which in turn reduced mortality. Most significant, she found that the size of these effects were larger than standard ordinary least squares estimates predicting the effect of education on health. In summary, one additional year of compulsory schooling led to as much as a 1.7 year increase in life expectancy at age 35.

¹ Some income can be disregarded to obtain eligibility for SSI. An individual is allowed a disregard of \$20 for any income and \$65 for income obtained through employment. Asset levels also determine eligibility. The maximum allowed asset levels are \$2,000 for individuals and \$3,000 for couples. Currently, a house of any value and a car worth of maximum of \$4,000 can be excluded from these limits. About 6 per cent of the elderly receive SSI benefits.

Whether or not there is a causal relationship between income and health is more strongly contested. A small but growing body of research has begun to estimate the extent to which the undisputedly sizable association between income and health is a product of the effect of income on health rather than vice versa. In particular, many economists are skeptical that health causally affects income. Instead, their theory and research focuses on the opposite causal direction of the relationship: how health status affects earnings, income and wealth. Health shocks lead to high out of pocket medical expenses, job loss and wage reductions, as well as changes in consumption behavior, all of which limit the accumulation of income and assets (Smith 1999; Palumbo 1999; Lillard and Weiss 1996). Indeed, older Americans spend around 20 per cent of their income on health expenses. Health care expenditures are then reflected in the income and assets of older Americans with poor health. Alternatively, other factors may causally influence both income and health, meaning the income-health association is simply spurious. For example, perhaps genetic factors determine both health and income. Basically, the argument is that health is a human capital variable (alongside education and training) that determines economic well-being, not the reverse (Grossman 1972).

Early epidemiological and sociological work relied largely on cross-sectional data to show the relationship between income and health (House et al. 1990; Kessler and Neighbors 1986; Ross and Huber 1985). These data could provide support for the hypothesis that income affected health but not strong causal evidence. However, throughout the 1980s and 1990s longitudinal studies that tracked health and basic income, education and occupational measures became more common (e.g., Burkhauser and Gertler 1995; House et al. 1994; Lynch et al. 1997; Maddox and Clark 1992; McDonough et al. 1997; Moore and Hayward 1990). To make stronger causal claims, researchers using these data began controlling for baseline health status and then examined how income levels and trajectories predicted subsequent changes in health over time (Fox et al. 1985; Lantz et al. 1998; Haan et al. 1987; Lynch et al. 1997). Some researchers, however, question whether even this approach could establish a true causal claim, arguing it could not rule out unobserved individual characteristics that determine both income and health, such as genetic factors, childhood health and childhood socioeconomic factors. Thus, more recent studies have implemented individual fixed

effect models with panel data to control for time invariant individual characteristics (Adams et al. 2003; Frijters et al. 2005; Lindahl 2005).

Other studies have focused on children or the elderly, as health shocks are less likely to have a direct causal effect on family income for children and retirees. The evidence on children is quite clear; poverty is bad for their health (Case et al. 2002). Adams and colleagues (2003) focused on those aged 70 and over. Linking individual measures of socioeconomic status to health showed that education was predictive of diabetes, arthritis and cognitive impairment. Wealth was linked to lung disease, income was linked to psychiatric problems and poor housing conditions were linked to general low self-rated health. But given the nonlinearity between wealth and income and health, an alternative approach that compared individuals with low and high socioeconomic status produced more significant results.² Low socioeconomic status was predictive of cancer, lung disease, arthritis, hip fractures, cognitive problems, psychiatric problems, depression and low self rated health.

Other researchers have exploited quasi experimental unanticipated increases in income. Looking at unanticipated increases in income is a credible strategy because those income increases are likely not caused by an individual's health but those increases may ultimately affect health. For example, a study in Sweden focused on individuals who won the lottery. Around 20 per cent of the survey sample had lottery winnings. The findings demonstrated that these lottery winnings had a strong effect on mortality, obesity and mental health (Lindahl 2005). Most importantly, the effect size was similar to the size of the association between regular household income and these health measures.

Frijters et al. (2005) examined how increases in income associated with East Germany's transition to a market economy, which were exogenous to individuals, affected individual's satisfaction with their health as measured using a scale from 1–10 (ranging from very satisfied to very unsatisfied). They found small but significant impacts. However, given the enormity of the change associated with a transition from a centralized economy to a market-based economy, along

² High socioeconomic status was defined as top quartile in wealth and income, college education and good neighborhood and dwelling. Low socioeconomic status was defined as bottom quartile in wealth and income, less than a high school education and poor neighborhood and dwelling.

with the other profound social changes associated with the transition from Soviet bloc to Western European, there may have been unobserved factors not taken into account that affected satisfaction with health.

Finally, the studies discussed above that address the effects of income support policies on the health of the elderly provide further evidence that there is a causal effect of income, particularly poverty, on health. Studies of the Progressa experiments in Mexico, South African pensions and SSI benefits in the U.S. found morbidity outcomes that support the argument that increases in income, particularly among the poor, lead to improvements in health.

In sum, findings from recent research that have attempted to address causality have been largely consistent with the view that income has an impact on health. Some studies have found small effects for specific health measures and other studies have found large effects. While these studies have become better at addressing selective individual characteristics and the confounding effects of employment, many have other limitations, including omitted variable bias. In particular, prior research has emphasized the finding that it is poverty that is bad for health but most of the prior studies test a linear relationship between income and health. Further, almost all of these studies capture short-term changes in health despite evidence that it is chronic poverty, as opposed to short-term poverty, which has the largest association with health (McDonough and Berglund 2003).

Conclusion

The relationship between social class, in this chapter defined as socioeconomic status, and health is consistent across time and across the life course. Those with low incomes and limited educational attainment live shorter and sicker lives than their counterparts with higher incomes and higher educational attainment. Further, as older Americans live longer and healthier lives on average, it is quite clear that these gains are not being distributed equally across the population. This chapter has focused on describing these trends as well as examining the debates over their causes and consequences.

This chapter demonstrates that the research on the relationship between socioeconomic status and health

and longevity is both broad and deep but as the debates in the literature make clear, much is still unknown. Perhaps the largest gap in the literature centers on the very question of how these disparities might be contained or controlled. While those who focus on the mediating factors between socioeconomic status and health argue for policies targeted at such intervening mechanisms as stress and unhealthy behaviors, fundamental cause theorists argue for policies that redistribute resources. But to date there has been very little research on how these different approaches, as enacted through policies, actually affect health. In particular, how do social policies, particularly those not directly related to health care, shape or reshape socioeconomic disparities in health. If we want to see socioeconomic gaps in health close, rather than continue to widen, then research that addresses this question can make a contribution.

References

- Adams P, Hurd MD, McFadden D, Merrill A, Ribeiro T (2003) Healthy, wealthy, and wise? Tests for direct causal paths between health and socioeconomic status. *J Econometrics* 112:3–56
- Adler NE, Boyce T, Chesney MA, Cohen S, Folkman S, Kahn RL et al (1994) Socioeconomic status and health: The challenge of the gradient. *Am Psychol* 49:15–24
- Adler NE, Ostrove JM (1999) Socioeconomic status and health: What we know and what we don't. In: Adler NE, Marmot M, McEwan BS, Stewart J (eds) Socioeconomic status and health in industrial nations: Social psychological and biological pathways. *Annals of the New York Academy of Sciences* 896:3–15
- Alaimo K, Olson CM, Frongillo EA, Briefel RR (2001) Food insufficiency, family income, and health in US children. *Am J Public Health* 91:781–786
- Aneshensel CS, Frerichs R, Huba G (1984) Depression and physical illness. *J Health Soc Behav* 25:350–371
- Backlund E, Sorlie PD, Johnson NJ (1999) A comparison of the relationships of education and income with mortality: The national longitudinal mortality study. *Soc Sci Med* 49(10):1373–1384
- Backlund E, Sorlie P, Johnson NJ (1996) The shape of the relationship between income and mortality in the United States: Evidence from the national longitudinal mortality study. *Ann Epidemiol* 6:12–23
- Barker DJ, Bull AR, Osmond C, Simmonds SJ (1990) Fetal and placental size and risk of hypertension in adult life. *Br Med J* 301(6746):259–262
- Barker DJ, Gluckman PD, Godfrey KM, Harding JE, Owens JA, Robinson JS (1993) Fetal nutrition and cardiovascular disease in adult life. *Lancet* 10(341):938–941

- Barker DJ, Godfrey KM, Fall C, Osmond C, Winter PD, Shaheen SO (1991) Relation of birth weight and childhood respiratory infection to adult lung function and death from chronic obstructive airways disease. *Br Med J* 303(6804): 671–675
- Barker DJP (ed) (1992) Fetal and infant origins of adult disease. British Medical Journal Books, London
- Barker DJP, Winter PD, Osmond C (1989) Weight in infancy and death from ischaemic heart disease. *Lancet* 2:577–580
- Bassuk SS, Berkman LF, Amick BC (2002) Socioeconomic status and mortality among the elderly: Finding from four U.S. communities. *Am J Epidemiol* 155:520–533
- Batty GD, Deary I (2004) Early life intelligence and adult health. *Br Med J* 329:585–586
- Beckett M (2000) Converging health inequalities in later life – an artifact of mortality selection. *J Health Soc Behav* 41(2): 106–119
- Bobak M, Pikhart H, Hertzman C, Rose R, Marmot M (1998) Socioeconomic factors, perceived control, and self-reported health in Russia. *Soc Sci Med* 47(2):269–279
- Borg V, Kristensen TS (2000) Social class and self rated health: Can the gradient be explained by differences in life style or work environment? *Soc Sci Med* 51:1019–1130
- Bosma H, Van Jaarsveld CH, Tuinstra J, Sanderman R, Ranchor AV, Van Eijk T et al (2005) Low control beliefs, classic coronary risk factors, and socio-economic differences in heart disease in older persons. *Soc Sci Med* 60(4):737–745
- Bosma H, Marmot MG, Hemingway H, Nicholson AC, Brunner E, Stansfeld SA (1997) Low job control and risk of coronary heart disease in Whitehall II study. *Br Med J* 314:558–565
- Burkhauser RV, Gertler PJ (1995) The health and retirement survey: Data quality and early results. *J Human Res* 30(supplement):S1–S318
- Byrne DG, Whyte HM (1980) Life events and myocardial infarction revisited: The role of measures of individual impact. *Psychosom Med* 42(1):1–10
- Cagney KA, Lauderdale DS (2002) Education, wealth, and cognitive function in later life. *J Gerontol, B: Psychol Sci Soc Sci* 57B:163–172
- Case A (2004) Does money protect health status? Evidence from South African pensions. In: David W (ed) *Perspectives on the economics of aging*, University of Chicago Press, Chicago, pp 287–311
- Case AC, Deaton A (2004) Broken down by work and sex: How our health declines. NBER Working Paper No. W9821. Cambridge, MA, NBER
- Case A, Fertig A, Paxson C (2005) The lasting impact of childhood health and circumstance. *J Health Econ* 24:365–389
- Case A, Lubotsky D, Paxson C (2002) Economic status and health in childhood: The origins of the gradient. *Am Econ Rev* 92(5):1308–1334
- Chaudhry S, Friedkin R, Horwitz R, Inouye SK (2004) Educational disadvantage impairs functional recovery after hospitalization in older persons. *Am J Med* 117:650–656
- Christensen U, Lund R, Damsgaard M, Holstein B, Ditlevsen S, Diderichsen F et al (2004) Cynical hostility, socioeconomic position, health behaviors, and symptom load: A cross sectional analysis in a Danish population based study. *Psychosom Med* 66:572–577
- Cohen S, Tyrell D, Smith A (1993) Negative life events, perceived stress, and susceptibility to the common cold. *J Pers Soc Psychol* 64:131–140
- Conley D, Strully KW, Bennett NG (2003) *The starting gate: Birth weight and life chances*. University of California Press, Berkeley
- Crimmins E, Saito Y (2001) Trends in healthy life expectancy in the United States. *Soc Sci Med* 52(11):1629–1641
- Currie J, Grogger J (2002) Medicaid expansions and welfare contractions: Offsetting effects on prenatal care and infant health. *J Health Econ* 21:313–335
- Dallman M, Pecoraro N, Akana S, la Fleur S, Gomez F, Houshyar H et al (2003) Chronic stress and obesity: A new view of comfort food. *PNAS* 100(20):116–196
- Deaton A, Paxson C (1998) Aging and inequality in income and health. *Am Econ Rev* 88(2):248–253
- de Jonge J, Bosma H, Peter R, Siegrist J (2000) Job strain, effort-reward imbalance and employee well-being: A large-scale cross-sectional study. *Soc Sci Med* 50:1317–1327
- Diex Roux A, Chambless L, Merkin S, Arnett D, Eigenbrody M, Nieto J et al (2002) Socioeconomic disadvantage and change in blood pressure associated with aging. *Circulation* 106:703–710
- Elder GH Jr, Johnson MK (2002) The life course and aging: Challenges, lessons, and new directions. In: Settersten Jr RA (ed) *Invitation to the life course: Toward new understandings of later life*, part II, chap 2. Baywood, Amityville, NY, pp 49–81
- Engelhardt G, Gruber J (2004) Social security and the evolution of elderly poverty. NBER Working Paper No. 10466. Cambridge, MA: NBER
- Estes CL (2001) *Social policy and aging: A critical perspective*. Sage Publications, Thousand Oaks, CA
- Fox AJ, Goldblatt PO, Jones DR (1985) Social class mortality differentials: Artifact, selection, or life circumstances. *J Epidemiol Commun Health* 39:1–8
- Frankel S, Elwood P, Sweetnam P, Yarnell J (1996) Birthweight, body mass index in middle age, and incident of coronary disease. *Lancet* 388:1478–1480
- Freedman VA, Crimmins E, Schoeni RF, Spillman B, Akyan H, Kramarov E et al (2004) Resolving inconsistencies in trends in old age disability: Report from a technical working group. *Demography* 41:417–441
- Fries JF (1980) Aging, natural death, and the compression of morbidity. *New Engl J Med* 303:13–135
- Frijters P, Haisken-DeNew J, Shields M (2005) The causal effect of income on health: Evidence from German reunification. *J Health Econ* 24(5):997–1017
- Gallo W, Bradley E, Dubin J, Jones R, Falba T, Teng H et al (2006) The persistence of depressive symptoms in older workers who experience involuntary job loss: results from the health and retirement study. *J Gerontol* 61B(4):S221–S228
- Gertler P (2000) Final report: The impact of PROGRESA on health. International food policy research institute, Washington, DC
- Goesling B (2005) The rising significance of education for health. Paper presented at the annual meeting of the Population Association of America in Philadelphia, PA (April)
- Goldman D, Smith J (2002) Can patient self-management explain the SES health gradient? *PNAS* 99(16):10929–10934

- Grossman M (1972) On the concept of health capital and the demand for health. *J Political Econ* 80(2):223–255
- Haan MN, Kaplan G, Camacho T (1987) Poverty and health: Prospective evidence from the Alameda county study. *Am J Epidemiol* 125:989–998
- Hart CL, Smith GD, Blane D (1998) Inequalities in mortality by social class measured at 3 states of the life course. *Am J Public Health* 88(3):471–474
- Hayward MD, Gorman BK (2004) The long arm of childhood: The influence of early-life social conditions on men's mortality. *Demography* 41:87–107
- Hayward M, Pienta A, McLaughlin D (1997) Inequality in men's mortality. *J Health Soc Behav* 38(4):313–330
- Herd P (2006) Do health inequalities diminish in old age? Functional decline in the 1931–1941 birth cohort. *Res Aging* 28(3):375–392
- Herd P, Goesling B, House JS (2007) Unpacking the relationship between socioeconomic position and health. *J Health Soc Behav* 48(3):223–238
- Herd P, Schoeni R, House JS (2008) Does the supplemental security program reduce disability among the elderly? *Milbank Q* 86(1):5–45
- Holland P, Berney L, Blane D, Davey Smith G, Gunnell DJ, Montgomery SM (2000) Life course accumulation of disadvantage: Childhood health and hazard exposure during adulthood. *Soc Sci Med* 50:1285–1295
- Hooyman NR, Gonyea J (1995) Feminist perspectives on family care: Policies for gender justice. Family caregivers application series, vol 6. Sage Publications: Thousand Oaks, CA
- House JS (1974) Occupational stress, and coronary heart disease. *J Health Soc Behav* 15:12–27
- House JS (1981) Work stress and social support. Addison Wesley, Reading, MA
- House JS (2002) Understanding social factors and inequalities in health: 20th century progress and 21st century prospects. *J Health Soc Behav* 43(2):125–142
- House JS, Kessler R, Herzog A (1990) Age, socioeconomic status and health. *Milbank Q* 68(3):383–411
- House JS, Landis K, Umberson D (1988) Social relationships and health. *Science* 241:540–545
- House JS, Lantz PM, Herd P (2005) Continuity and change in the social stratification of aging and health over the life course: Evidence from a nationally representative longitudinal study from 1986 to 2001/2002 (the Americans' Changing Lives Study). *J Gerontol Series B: Psychol Sci Soc Sci* 60:S15–S26
- House JS, Lepkowski J, Kinney A, Mero R, Kessler R, Herzog AR (1994) The social stratification of aging and health. *J Health Soc Behav* 35(3):213–234
- House JS, Strecher V, Metzner HL, Robbins C (1986) Occupational stress among men and women in the Tecumseh community. *J Health Soc Behav* 27:62–77
- House JS, Williams D (2000) Understanding and reducing socioeconomic and racial/ethnic disparities in health. In: Smedley BD, Syme SL (eds) *Promoting health: Intervention strategies from social and behavioral*, National Academy Press, Washington DC, pp 82–124
- Huxley R, Neil A, Collins R (2002) Unraveling the fetal origins hypothesis: is there really an inverse association between birth weight and subsequent blood pressure? *Lancet* 360(9334):659–665
- Iribarren C, Jacobs DR, Kiefe CI, Lewis CE, Mathews KA, Roseman RJ et al (2005) Causes and demographic, medical, lifestyle, and psychosocial predictors of premature mortality: The CARDIA study. *Soc Sci Med* 60(3):471–482
- Johnson R, Schoeni R (2006) The influence of early life events on health, human capital accumulation, and labor market outcomes in adulthood. Paper presented at the IRP Research on Low-Income Population summer workshop in Madison, WI (June)
- Kawachi I, Kennedy B (1999) Income inequality and health: Pathways and mechanisms. *Health Serv Res* 34(1):215–220
- Kessler RC (1979) Stress, social status, and psychological distress. *J Health Soc Behav* 20(3):259–272
- Kessler R, Neighbors H (1986) A new perspective on the relationships among race, social class, and psychological distress. *J Health Soc Behav* 27(2):107–115
- Kitagawa E, Hauser P (1973) *Differential mortality in the United States: A study of social epidemiology*. Harvard University, Cambridge, MA
- Kittleson MM, Meoni LA, Wang NY, Chu AY, Ford DE, Klag MJ (2006) Association of childhood socioeconomic status with subsequent coronary heart disease. *Physicians Arch Intern Med* 166(21):2356–2361
- Kompiers M, Cooper C (1999) *Preventing stress, improving productivity: European case studies in the workplace*. Routledge, New York
- Kunst A, Mackenbach J (1994) The size of mortality differences associated with educational level in nine industrialized countries. *Am J Public Health* 84:932–937
- Lantz PM, House JS, Mero R, Williams DA (2005) Stress, life events and socioeconomic disparities in health: Results from the Americans' Changing Lives Study. *J Health Soc Behav* 46(3):274–288
- Lantz P, House JS, Lepowski JM, Williams D, Mero R, Chen J (1998) Socioeconomic factors, health behaviors, and mortality. *J Am Med Assoc* 279:1703–1708
- Lawlor DA, Ebrahim S, Davey Smith G (2005) Adverse socioeconomic position across the life course increases coronary heart disease risk cumulatively: Findings from the British Women's Heart and Health Study. *J Epidemiol Commun Health* 59:785–793
- Lenthe FJ, Brug J, Mackenbach JP (2005) Neighborhood inequalities in physical inactivity: The role of neighborhood attractiveness, proximity to local facilities and safety in the Netherlands. *Soc Sci Med* 60(4):763–765
- Liao Y, McGee D, Kaufman J, Cao G, Cooper R (1999) Socioeconomic status and morbidity in the last years of life. *Am J Public Health* 89:569–572
- Lillard L, Weiss Y (1996) Uncertain health and survival: Effect on end-of-life consumption. *J Bus Econ Stat* 15(2):254–268
- Lindahl M (2005) Estimating the effect of income on health and mortality using lottery prizes as an exogenous source of variation in income. *J Human Res* 40(1):144–168
- Link BG, Phelan J (1995) Social conditions as fundamental causes of disease. *J Health Soc Behav (Extra Issue)*:80–94
- Lleras-Muney A (2005) The relationship between education and adult mortality in the United States. *Rev Econ Stud* 72(1):847–863
- Lundberg O (1991) Causal explanations for class inequality in health. *Soc Sci Med* 32(4):385–393
- Luo Y, Waite LJ (2005) The impact of childhood and adult SES on physical, mental and cognitive well-being. *J Gerontol* 60B(2):S93–S101

- Lynch JW, Kaplan GA, Shema SR (1997) Cumulative impact of sustained economic hardship on physical, cognitive, psychological, and social functioning. *Engl J Med* 337:1889–1895
- Lynch J, Davey Smith G, Harper S, Hillemeier M, Ross N, Kaplan G et al (2004) Is income inequality a determinant of population health. *Milbank Q* 82(1):5–99
- Lynch S (2003) Cohort and life-course patterns in the relationship between education and health: A hierarchical approach. *Demography* 40:309–331
- Mackenbach JP, Looman CW, van der Meer JB (1996) Differences in the misreporting of chronic conditions by level of education. *Am J Public Health* 86(5):706–711
- Maddox G, Clark D (1992) Trajectories of functional impairments in later life. *J Health Soc Behav* 33(2):114–125
- Manton K, Stallard E, Corder L (1997) Education specific estimates of life expectancy and age-specific disability in the U.S. elderly population 1982 to 1991. *J Aging Health* 9(4):419–450
- Marmot M, Siegrist J, Theorell T, Feeney A (1999) Health and the psychosocial environment at work. In: Marmot MG, Wilkinson R (eds) *Social determinants of health*. Oxford: Oxford University Press
- Marmot M (1999) Multi-level approaches to understanding social determinants. In: Berkman L, Kawachi I (eds) *Social epidemiology*. Oxford University Press, Oxford
- McDonough P, Berglund P (2003) Histories of poverty and self-rated health trajectories. *J Health Soc Behav* 44(2):198–214
- McDonough P, Duncan GJ, Williams D, House JS (1997) Income dynamics and adult mortality in the United States, 1972 through 1989. *Am J Public Health* 87(9):1476–1483
- McGinnis MJ, Williams-Russo P, Knickman J (2002) The case for more active policy attention to health promotion. *Health Affairs* 21(2):78–93
- McGrath JE (1970) *Social and psychological factors in stress*. Holt, Rinehart and Winston, New York
- McLeod JD, Kessler RC (1990) Socioeconomic status differences in vulnerability to undesirable life events. *J Health Soc Behav* 31(2):162–172
- Mellor JM, Milyo J (2001) Reexamining the evidence of an ecological association between income inequality and health. *J Health Polit, Policy Law* 26(3):487–522
- Mendelson T (2006) Effects of experimentally-induced social status on affect and physiology: A pilot study. Paper presented at the annual meeting of the Robert Wood Johnson Health and Society Scholars in Washington, DC
- Miech R, Eaton W, Brennan K (2005) Mental health disparities across education and sex: A prospective analysis examining how they persist over the life course. *J Gerontol* 60B:93–98
- Miech R, Shanahan M (2000) Socioeconomic status and depression over the life course. *J Health Soc Behav* 41(2):162–176
- Mirowsky J, Ross CE (1999) Economic hardship across the life course. *Am Sociol Rev* 64:548–569
- Moore DE, Hayward M (1990) Occupational careers and mortality of elderly men. *Demography* 27:313–353
- Mustard CA, Derkson S, Berthelot J, Wolfson M, Roos LL (1997) Age-specific education and income gradients in morbidity and mortality in a Canadian province. *Soc Sci Med* 45:383–397
- National Center for Health Statistics (2004) Life expectancy at birth, 65 and 85 years of age, by sex and race: United States, selected years 1900–2003. Retrieved from <http://209.217.72.34/aging/TableViewer/tableView.aspx?ReportId=357>
- National Occupation Research Agenda (2001) Nora fact sheet. Publication number 2002-101. Retrieved from <http://www.cdc.gov/niosh/01-101.html>
- Newsom CA, Shiell AW, Fall CD, Phillips DI, Shier R, Law CM (2003) Is birth weight related to later life glucose and insulin metabolism. *Diabetic Med* 20(5):1464–1491
- Noymer A (2001) Mortality selection and sample selection: A comment on Beckett. *J Health Soc Behav* 42(3):326–327
- O’Rand AM, Henretta JC (1999) Age and inequality: Diverse pathways through later life. Westview Press, Boulder, CO
- Palumbo M (1999) Uncertain medical expenses and precautionary saving near the end of the life cycle. *Rev Econ Stud* 66(227):395–421
- Pappas G, Queen S, Hadden W, Fisher G (1993) The increasing disparity in mortality between socioeconomic groups in the United States, 1960 and 1986. *New Engl J Med* 329(2):103–109
- Parsons TJ, Power C, Logan S, Summerbell CD (1999) Childhood predictors of adult obesity. *Int J Obes Relat Metab Disord* 23(8):S1–S107
- Pensola TH, Martikainen P (2003) Cumulative social class and mortality from various causes of adult men. *J Epidemiol Commun Health Serv* 57:745–751
- Poulton R, Caspi A, Milne B, Thomson M, Taylor A, Sears M et al (2002) Association between children’s experience of socioeconomic disadvantage and adult health: A life course study. *Lancet* 360:1640–1645
- Power C, Hypponen E, Davey Smith G (2005) Socioeconomic position in childhood and early adult life and risk of mortality: A prospective study of the mothers of the 1958 British birth cohort. *Am J Public Health* 95(8):1396–1402
- Prus S (2005) A life course perspective on the relationship between socioeconomic status and health: Testing the divergence hypothesis. *Can J Aging (Suppl)*:S145–S153
- Robert S (1998) Community level socioeconomic effects on adult health. *J Health Soc Behav* 39:18–37
- Rodin J (1986) Aging and health: Effects of sense of control. *Science* 233:143–149
- Ross C, Huber J (1985) Hardship and depression. *J Health Soc Behav* 26(4):312–327
- Ross C, Mirowsky J (2003) *Education, social status, and health*. De Gruyter, New York
- Ross C, Mirowsky J (2001) Neighborhood disadvantage, disorder and health. *J Health Soc Behav* 42(3):258–276
- Ross C, Wu C (1995) The links between education and health. *Am Sociol Rev* 60(5):719–745
- Ross C, Wu C (1996) Education, age, and the cumulative advantage in health. *J Health Soc Behav* 37(March):104–120
- Rowe JW, Kahn RL (1987) Human aging: Usual and successful. *Science* 237:143–149
- Sapolsky R (1993) Endocrinology afresco: Psychoendocrine studies of wild baboons. *Recent Prog Horm Res* 48:437–468
- Schnall PL, Landsbergis PA, Baker D (1994) Job strain and cardiovascular disease. *Ann Rev Public Health* 15:381–411
- Schoeni RF, Martin LG, Andreski P, Freedman V (2005) Persistent and growing socioeconomic disparities in disability among the elderly: 1982–2002. *Am J Public Health* 95(11):2065–2070
- Selye H (1956) *The stress of life*. McGraw-Hill, New York

- Singh-Manoux A, Ferrie J, Chandola T, Marmot M (2004) Socioeconomic trajectories across the life course and health outcomes in midlife: Evidence for the accumulation hypothesis? *Int J Epidemiol* 33:1072–1079
- Smith JP (1999) Healthy bodies and thick wallets: The dual relation between health and economic status. *J Econ Perspect* 13(2):145–166
- Smith T, Glazer K, Ruiz J, Gallo L (2004) Hostility, anger, aggressiveness, and coronary heart disease: An interpersonal perspective on personality, emotion, and health. *J Person* 72(6):1217–1224
- Stokols D (1992) Establishing and maintaining healthy environments: Toward a social ecology of health promotion. *Am Psychol* 47(1):6–22
- Stronks K, van de Mheen HD, Mackenbach JP (1998) A higher prevalence of health problems in low income groups: Does it reflect relative deprivation? *J Epidemiol Community Health* 52:548–557
- Taubman PJ, Sickles RC (1983) Supplemental social insurance and the health of the poor. NBER Working Paper No. 1062. Cambridge, MA: NBER
- Townsend P, Davidson N, Whitehead M (1992) Inequalities in health and the health divide. Penguin, London
- Turner RJ, Marino F (1994) Social support and social structure: A descriptive epidemiology. *J Health Soc Behav* 35:193–212
- Turner RJ, Noh S (1988) Physical disability and depression. *J Health Soc Behav* 29:23–37
- Turner RJ, Wheaton B, Lloyd DA (1995) The epidemiology of social stress. *Am Sociol Rev* 60:104–125
- Turrell G, Lynch J, Kaplan G, Everson S, Helkala E, Kauhanen J et al (2002) Socioeconomic position across the lifecourse and cognitive function in late middle age. *J Gerontol* 57B, S43–S51
- Uhlenberg P (1996) Mutual attraction: Demography and life-course analysis. *Gerontologist* 36(2):226–229
- Umberson D, Williams K (2005) Marital quality, health and aging: Gender equity? *J Gerontol B: Psychol Sci Soc Sci* 60B, S109–S113
- Wadsworth MEJ, Kuh DJL (1997) Childhood influences on adult health: A review of recent work from the British 1946 national birth cohort study, the MRC national survey of health and development. *Pediatr Perinat Epidemiol* 11:2–10
- Wamala S, Lynch J, Kaplan G (2001) Women's exposure to early and later life socioeconomic disadvantage and coronary heart disease risk: The Stockholm female coronary risk study. *Int J Epidemiol* 30:275–284
- Wen M, Hawkey LC, Cacioppo JT (2006) Objective and perceived neighborhood environment, individual SES and psychosocial factors, and self-rated health: An analysis of older adults in cook county, illinois. *Soc Sci Med* 63:2575–2590
- Williams D, House JS (1985) Social support and stress reduction. In: Cooper CL, Smith MJ (eds) *Job stress and blue collar work*, Wiley, London: pp 207–224
- Williams D, Collins C (1995) US socioeconomic and racial differences in health: patterns and explanations. *Ann Rev Sociol* 21:349–386
- Wolfson M, Rowe G, Gentleman JF, Tomiak M (1993) Career earnings and death: a longitudinal analysis of older Canadian men. *J Gerontol* 48:S167–S179
- World Health Organization (2006) Commission on the social determinants of health. Retrieved from http://www.who.int/social_determinants/resources/csdh_brochure.pdf

Part VI
Health Care and Aging

Chapter 27

Population Aging and Health Care Policy in Cross-National Perspective

Stephen Crystal and Michele J. Siegel

Introduction

Across the developed nations, the impact of population aging on health care expenditures is a high-profile public policy concern. Whatever its level in a given country, the existing burden of health care costs is often perceived as being at or near the limits of societal affordability. When future costs are discussed in national policy debates, in light of the additional financial pressures associated with projected population aging, there are often dire warnings of oncoming crisis and a tone of demographic determinism.

If population aging causes unsustainable health care cost burden, presumably those developed countries that have experienced the most population aging would also incur the greatest societal burden for health care costs. It is, therefore, of interest to examine the relationship between population age structure and health care cost burdens among the wealthy developed countries. We explore this issue using the 2006 Organization for Economic Cooperation and Development (OECD) Health Data. The 30 OECD members for which these data are available now include, in addition to the most-developed nations with mature economies, some countries with less fully developed economies (for example, Mexico, Turkey and Poland each had per capita gross domestic product in 2004 that was well under half the OECD mean). In order to compare health care expenditures among countries of broadly similar levels of

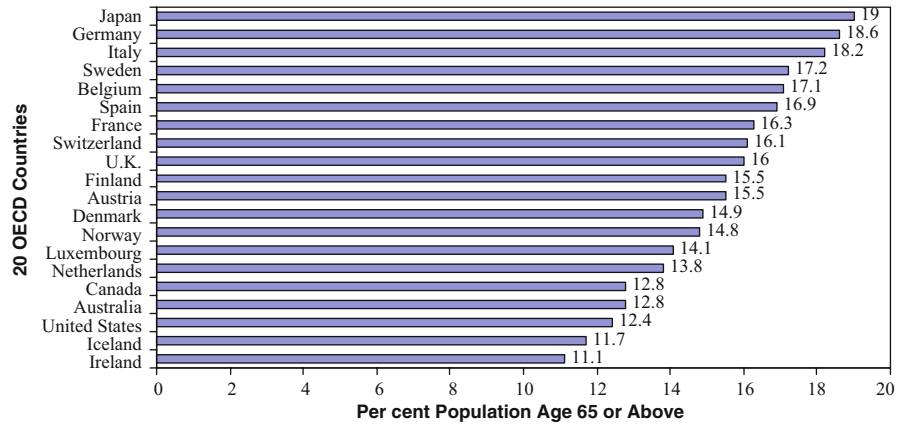
economic development, we make comparisons across the 20 OECD countries with the highest levels of per capita gross domestic product (GDP) in 2004.

It is certainly true that within a given health care system, expenditures are higher for elderly individuals. In 1999, average per capita health spending for Americans aged 65 and above was more than triple that for those aged 34–44. For Americans age 75 and older, average per capita health spending was five times as high (Reinhardt 2003). However, cross-national comparisons suggest that the old-age dependency ratio is not the key driver of the overall health cost burden. Increasing longevity and declining fertility rates have increased the old-age dependency ratio in all of the industrialized countries. For example, by 2000, the elderly accounted for more than 15 per cent of the population in Japan, Germany, France and the United Kingdom versus 12.4 per cent in the United States. The percentage of the population age 65 or above in 2003 in the 20 OECD countries with the highest GDP per capita, is shown in Fig. 27.1. The projected proportion of the U.S. population age 65 or above in the year 2020 will be comparable to the proportion age 65 or above in Japan, Germany, France and the United Kingdom that had already been reached by the year 2000 (Anderson and Hussey 2000; Weiner and Tilly 2002).

With a lower proportion of elderly than many other nations, the U.S. spends more on health care by any measure than any other country and the gap is substantial. In 2003, the U.S. spent 15.2 per cent of gross domestic product on health care, or \$5711 per capita. Adjusting local-currency expenditures to U.S. dollar purchasing power parity (PPP), 2002 per capita health expenditures in the U.S. were 240 per cent of those at the OECD median (Anderson, Hussey, Frogner and Waters 2005), and 153 per cent of those for Switzer-

S. Crystal (✉)
Rutgers University
30 College Avenue
New Brunswick, NJ 08901, USA
E-mail: scrystal@rci.rutgers.edu

Fig. 27.1 Per cent of population age 65 or above



Source: OECD Data, 2006.

land, the closest runner-up other than the tiny state of Luxembourg. Per capita expenditures for 2003 at U.S. dollar PPP for the 20 OECD countries with the highest GDP per capita are shown in Fig. 27.2.

Clearly, the United States is an outlier. Across a range of countries, however, what is the relationship between the proportion of the population that is elderly and the societal burden of health care expenditures (share of GDP spent on health care)? To examine this question, we used the most recent data on expenditures and population consistently available (for 2003), for the 20 countries. These data are shown in Table 27.1.

The relationship (shown in Table 27.1) between the proportion of the population age 65 and above and the health care cost burden across the countries is most easily appreciated when the data are displayed in scatterplot form. Figure 27.3 shows a scatterplot and linear

trend line, with proportion of the population age 65 and above on the x-axis and proportion of GDP spent on health care on the y-axis, among the 20 countries.

This scatterplot suggests that there is little systematic relationship between the percentage of GDP spent on health care and the extent of population aging that has been reached by a particular country. Indeed, with the United States included, the association is slightly negative (this is no longer the case if the United States is not included). This finding is consistent with that of an earlier study that found a slight negative correlation between the proportion of GDP spent on health care for persons age 65 and above and the proportion of the population in this age group (Anderson and Hussey 2000). Other factors, such as societal choices on the structure of health care systems, appear to be much more important than population age composition.

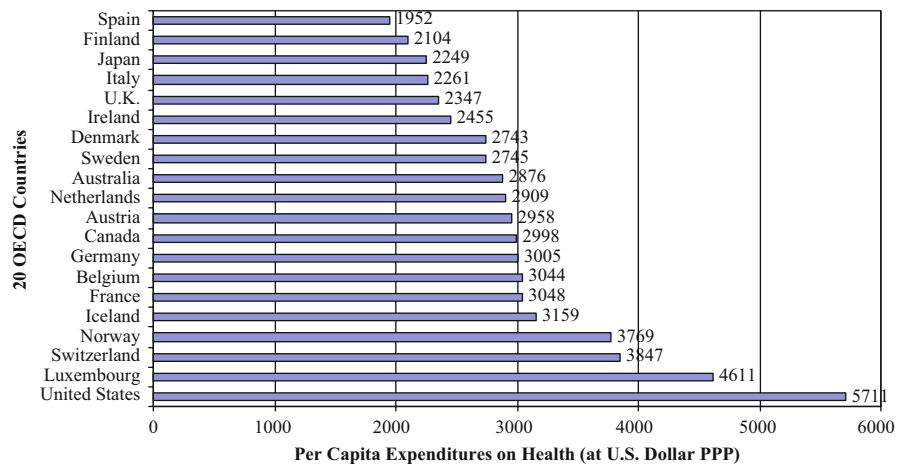


Fig. 27.2 Total per capita expenditures on health at U.S. dollar PPP (2003)

Source: OECD Health Data, 2006.

Table 27.1 Population aging and health expenditures (2003)

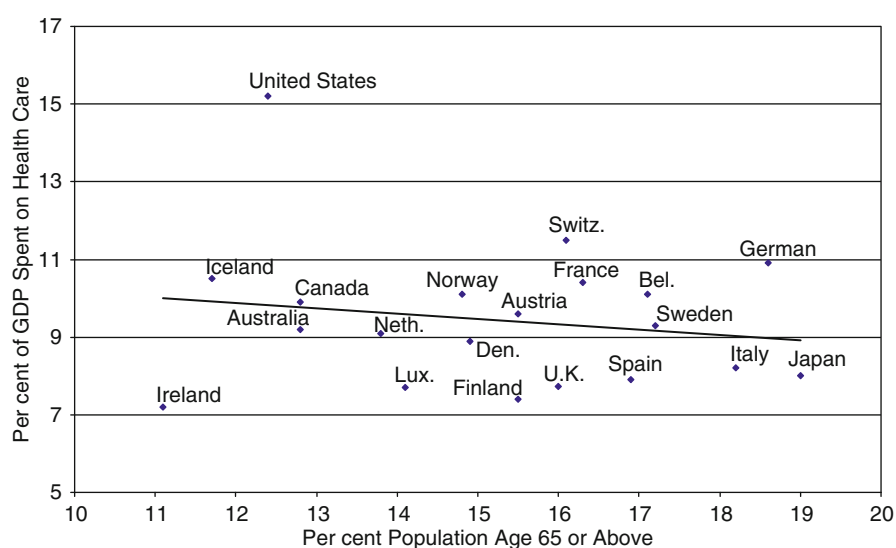
OECD Countries	Per cent population ≥ 65	Per cent GDP spent on health	Per cent health spending private
Australia	12.8	9.2	32.5
Austria	15.5	9.6	29.7
Belgium	17.1	10.1	28.2
Canada	12.8	9.9	29.9
Denmark	14.9	8.9	17.1*
Finland	15.5	7.4	23.8
France	16.3	10.4	21.7
Germany	18.6	10.9	21.8
Iceland	11.7	10.5	16.5
Ireland	11.1	7.2	22.0
Italy	18.2	8.2	24.9
Japan	19.0	8.0	18.5
Luxembourg	14.1	7.7	9.4
Netherlands	13.8	9.1	36.9
Norway	14.8	10.1	16.3
Spain	16.9	7.9	29.6
Sweden	17.2	9.3	14.6
Switzerland	16.1	11.5	41.5
United Kingdom	16.0	7.72	14.6
United States	12.4	15.2	55.4

Source: OECD Data 2006

*2002 data used

The scatterplot also facilitates comparisons on a country by country basis. Each of the countries represents, in some sense, a unique historical “experiment” in managing the provision of health care nationally, and a comprehensive country-by-country review of these variations is beyond the scope of this chapter. Wide variation in expenditures exists both among countries with

“older” populations and those with “younger” populations. For example, among the nine countries with 16 per cent or more of the population over age 65 (Great Britain, France, Spain, Sweden, Belgium, Italy, Germany, Switzerland and Japan), health care expenditures ranged from 7.7 per cent of GDP (Great Britain) to 11.5 per cent (Switzerland). Again, the outlier status of the U.S. is

**Fig. 27.3** Per cent population age 65 or above by per cent GDP spent on health care (2003)

Source: OECD Health Data, 2006.

apparent in these comparisons, as none of these, including the three with more than 18 per cent of the population age 65 or above (Germany, Japan and Italy), comes close to the level of health care spending that characterizes the U.S. Among the five countries with 13 per cent or less of the population aged 65+ (United States, Iceland, Ireland, Australia and Canada), expenditures ranged from 7.2 per cent of GDP (Ireland) to 15.2 per cent (United States). It should be noted that the outlier status of the U.S. cannot be accounted for by its somewhat higher per capita GDP. One study (Anderson, Hussey, Frogner, and Waters 2005) found that U.S. health spending per capita is \$2,037 higher than its GDP would predict.

Considering the concerns about public versus private roles in the health care system discussed below, it is of interest to compare the economic burden of health care spending across countries that vary in the roles of these sectors. To explore the relationship between expenditure burden and the financial roles of the private and public sectors, Fig. 27.4 provides a scatterplot with proportion of health care spending in the private sector on the x-axis and proportion of GDP spent on health care on the y-axis. Results indicate that health care cost burden tends to be higher in countries where more of the spending takes place in the private sector, a relationship that persists even if the United States (the great outlier) is not included.

Figure 27.4 suggests that health care cost burden has more to do with national health care policy choices than it does with population aging. The United

States and Switzerland, where the private sector plays a relatively larger role (see Figs. 27.4 and 27.5), are also the countries with the highest overall spending. Countries with mixed systems, such as Canada, Austria and Italy, have intermediate rates of spending, while health care spending as a proportion of GDP tends to be lower among countries where the private sector plays a relatively small role as a health care payer, such as Great Britain and the Scandinavian countries.

The lack of relationship between population aging and overall health care spending in cross-national comparisons, as reflected in Fig. 27.3, is consistent with findings of several earlier studies. For example, Reinhardt (2003), reviewing several studies in the economics literature, found little relationship between the relative size of a nation's elderly population and annual growth in aggregate health care use and spending. In another study, he and his colleagues predicted that population aging in 2030 would contribute one-sixteenth of the expected annual growth rate in U.S. health spending. The factors projected to have a far greater impact on the growth rate included overall population growth, increased use of health care – including expensive new technologies – by all age groups, general price inflation, and the additional inflation in the prices of medical services (Reinhardt et al. 2002). Similarly, Gruber and Wise (2002) examined cross-national relationships between population age structure and total national health spending, in

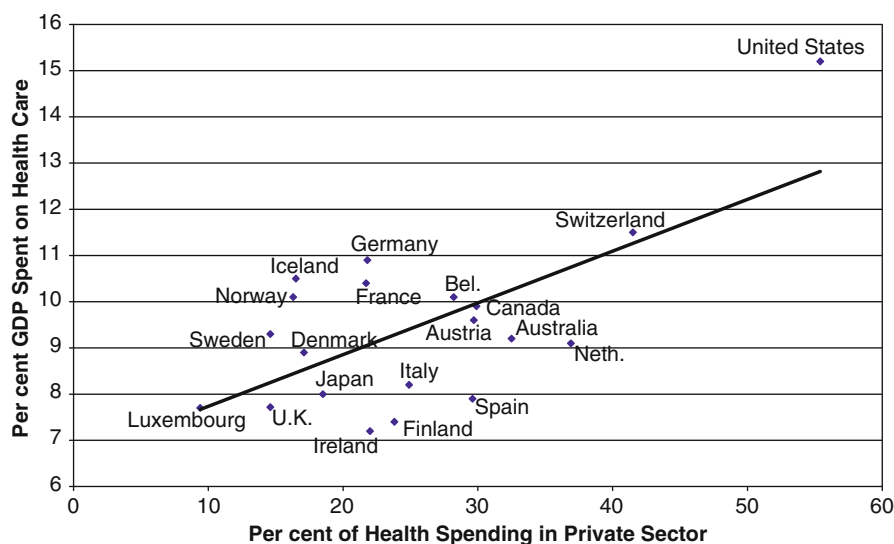
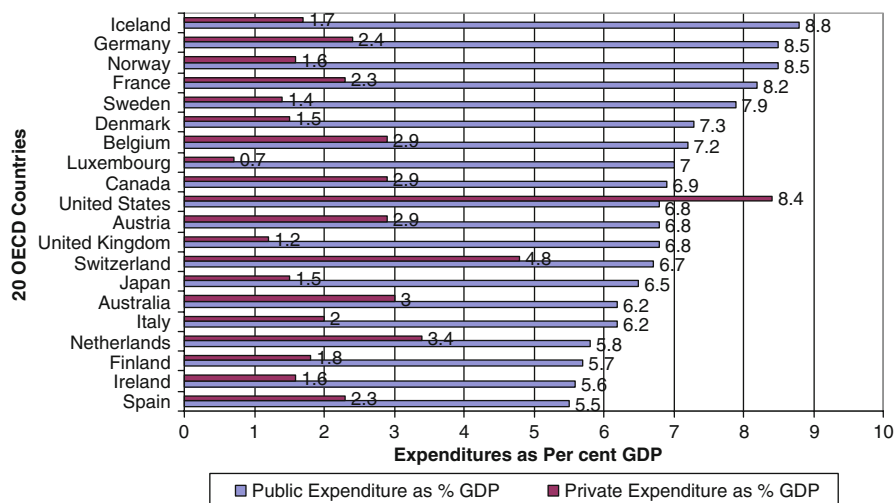


Fig. 27.4 Per cent of health expenditures in private sector by per cent of GDP spent on health care (2003)

Source: OECD Health Data, 2006.

Fig. 27.5 Public and private health expenditures as per cent GDP (2003)



Source: OECD Health Data, 2006.
Data for Denmark from 2002

a multivariate analysis with country and year fixed effects, and did not find any statistically significant relationship between the percentage of the population age 65 or above and total national health spending as a percentage of GDP (Reinhardt 2003).

Demographic Pressures, Cost Projections and Trust Funds

The public sector accounts for a large share of health care spending in every country. Indeed, although private-sector health care spending is much higher in the United States than in any of the other countries, U.S. public-sector health care spending as a percentage of GDP is in a similar range to that of many of the other OECD countries (see Fig. 27.5). Public-sector health care expenditures are financed through a variety of means across the countries, including general revenue taxation from the federal government; tax revenues from provincial or other subnational levels of government; and mandatory employer and employee contributions. Regardless of the financing mechanism, health care expenditures are usually financed from current revenues. In the U.S., however, the concept of trust fund financing, borrowed from the Social Security pension system, has been applied to Medicare, the major health care program for the elderly. While a detailed discussion

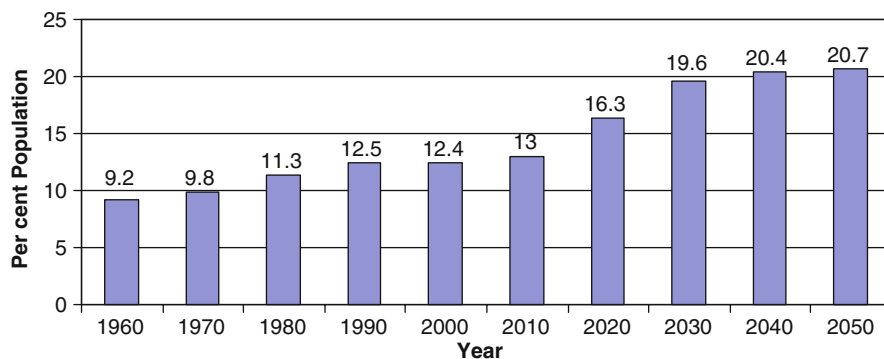
of financing mechanisms across the OECD countries is beyond the scope of this chapter, it is of interest to explore the role of the trust fund concept in debates over “sustainability” in the U.S.

Both for pensions (Social Security) and for health care for the elderly (Medicare), existing systems of trust fund financing have served as a focal point for debates over “reform,” typically focusing on coming “insolvency” of the trust funds. While our focus is on health care financing, it is instructive to first briefly examine the debate over Social Security “insolvency,” which is clearer since future obligations are more predictable. These benefits are funded through employer-employee payroll taxes and through the Old Age and Survivors Insurance (OASI) Trust Fund. If outlays fall short of payroll tax income for a given year, the surplus increases the assets of the trust fund and is invested in special Treasury bonds. (A similar trust fund exists for Social Security’s disability insurance program).

The debate in the U.S. over the sustainability of Social Security, as well as Medicare, centers on the impact of the projected increase in the proportion of the population who are elderly. A 2004 U.S. Census Bureau projection of this increase is shown below (Fig. 27.6).

Currently and (as projected) for the next several decades, payroll tax income substantially exceeds expenditures to support benefits for current retirees. In 2007, for example, OASI income at \$676 billion

Fig. 27.6 Per cent U.S. population ≥ 65 years



Source: U.S. Census Bureau, Interim Projections by Age, Sex, Race and Hispanic Origin, 2004.

exceeded its expenditures of \$492 billion by 27 per cent. Although the rest of the federal budget ran a substantial deficit, the OASI surplus increased trust fund balances by \$183 billion, an annual surplus that is projected by the Social Security Trustees to increase to \$263 billion annually in 2013 (Social Security Administration 2007). Indeed, it has been noted that in the national budgetary accounts, the Social Security surplus tends to mask a very large deficit in the rest of the budget attributable in part to the tax cuts of the early 2000s, which created a debt burden that will overhang the economy during the era of the boomers' retirement. Arguably this growing debt constitutes a more severe future economic problem than the Social Security obligations themselves.

As projected in the 2007 Social Security and Medicare Trustees' Report, OASI outgo is expected to begin to exceed income in 2028, at which time an annual net drawdown of trust fund balances would begin – small at first and increasing over time. In 2042, it is projected that the trust fund assets would be exhausted. Although sometimes referred to as an “insolvency” or “bankruptcy” scenario, this milestone would not mean that no funds would be available to pay benefits, but rather that annual revenues would begin to fall short of 100 per cent of promised benefit levels, requiring adjustments to benefit levels, revenues, or both. By 2081, tax income would cover only 70 per cent of scheduled benefits (Social Security Administration 2007). Seventy-five years are, of course, a very long time horizon for planning purposes and projections this far out are somewhat speculative. In any event, whether to consider as a present crisis the need to adjust benefits or revenues by 2028 by a modest amount to bring rev-

enues and outlays into continuing balance – or, failing that, the need to address later on a shortfall that would reach 30 per cent by 2081 – may be in the eye of the beholder.

In contrast to Social Security, Medicare relies on a combination of a payroll tax (with an associated trust fund) and general revenues, as well as substantial revenues from monthly beneficiary premiums. Medicare's largest component, the Supplementary Medical Insurance portion that covers physician and various other health services, has always been supported through a combination of general revenue and beneficiary premiums, as is the newer prescription drug insurance (Part D) program. Expenditures for the Part A or Hospital Insurance (HI) component of Medicare (which also covers some other services such as post-acute nursing home care and home health care) are currently covered through the payroll tax, with HI trust fund income exceeding expenditures by about 7 per cent in 2007 (Social Security Administration 2007). However, HI payroll taxes are projected to fall short of expenditures much sooner than is the case for OASDI, with HI trust fund balances projected to be exhausted under current law by 2019, at which point a Part A shortfall would exist that would need to be addressed by additional revenues or benefit reductions.

As with Social Security, while the projected HI shortfall has often been portrayed as constituting “insolvency” or “bankruptcy”, trust fund exhaustion does not mean that no further funds would be available to pay benefits, but rather that continuing revenues would cover less than 100 per cent of promised benefits. To the extent that the trust funds are really the issue, the post-2019 problem of imbalance between trust fund revenues and expenditures could

be corrected through any or a combination of several incremental strategies, such as shifting some of the nonhospital services currently covered by Part A to Part B, or by reducing Medicare reimbursement for managed care plans to a level closer to the cost that the same beneficiaries would have incurred in the traditional plan and crediting the savings to the trust fund. An observer of the often ideologically-tinged debate over this issue in the U.S. might reasonably conclude that for some of the critics, trust fund solvency is less the real issue than a useful stalking horse or target for attack on the existing defined-benefit Medicare program, with the objective of reducing the direct role of government in the program through various forms of privatization and defined-contribution strategies. In any event, the projected year-2019 trust fund exhaustion has less to do with population aging than with the projected rate of increase in per capita expenditures, which substantially exceeds the projected growth of revenues (and of inflation in the economy at large).

While much political debate has centered on the issue of trust fund solvency, we would argue that the real issue of sustainability is the total projected level of health care expenditures for the elderly population in relation to the total size of the economy and its ability to provide the needed resources – whether the expenditures come from a trust fund, general revenues, or out of pocket expenditures for services or insurance premiums by beneficiaries or their families,

Table 27.2 Medicare and Social Security expenditures as a share of GDP (percentages)

Calendar year	Medicare	Social Security	Medicare plus Social Security
2005	2.7	4.2	7.0
2006	3.2	4.3	7.5
2007	3.3	4.3	7.5
2008	3.4	4.2	7.6
2009	3.5	4.3	7.7
2010	3.5	4.3	7.8
2020	4.7	5.3	9.9
2030	6.5	6.2	12.7
2040	8.0	6.4	14.3
2050	9.0	6.3	15.2
2060	9.8	6.3	16.0
2070	10.5	6.3	16.8
2080	11.0	6.3	17.3

Source: American Academy of Actuaries (2006a) Medicare Trustees' Report and (2006b) Social Security Trustees' Report

former employers through retiree health plans, or other sources. The governmental part of these expenditures, under existing law, has been projected by the Social Security Trustees as shown in Table 27.2. According to these projections, by 2030, when the tail end of the boomer cohort (those born in 1965) reaches age 65, the proportion of GDP accounted for by Social Security and Medicare will have almost doubled and Medicare will account for a slightly higher share than Social Security. From some perspectives, it is only natural and not particularly shocking, that health care expenditures through Medicare would account for a higher share of national spending when the population becomes older, while the goods and services most-used by the young would account for a smaller share. However, for critics strongly wedded to “small-government” ideologies, it may be the prospect that these expenditures would take place through the public sector (and financed by taxation) that may be the greatest concern.

Who Pays the Piper? Shifting the Costs to the Consumer

In response to the perceived dilemma of sustainability, there have been recurring efforts in the U.S. by influential members of Congress to shift the impact of rising Medicare costs from the government and taxpayers to Medicare recipients. Otherwise, it is claimed, there will need to be huge cuts in services or huge increases in taxes. Such proposals have often taken the form of efforts to redesign Medicare from a “defined benefit” to a “defined contribution” program, in which the government provides a defined monetary sum to each beneficiary so that he or she may purchase health insurance in the private market.

Under such proposals, a range of plans of varying degrees of generosity would exist in the market and beneficiaries with disposable income would be able to add their own funds to the federally-provided amount in order to purchase more comprehensive coverage. This approach is argued to encourage cost-efficiency because beneficiaries are directly exposed to costs that exceed the value of the federal contribution (Marmor and Oberlander 1998). However, in contrast to single-payer, defined-benefit plans, such arrangements entail

substantial administrative and marketing costs that divert significant shares of funds from health care services to overhead (Woolhandler et al. 2003; Krugman 2007). Also, such a system for the Medicare population could well result in lower-income beneficiaries (who tend to have worse health and more health care needs) receiving coverage that is on average more limited than that of higher-income beneficiaries. Such systems are also subject to a variety of adverse selection problems that can lead to a “melt-down” of the more generous plans (Marmor and Oberlander 1998).

Another variation on the defined-contribution approach has involved various proposals to move to a privatized system of prefunding Medicare benefits through mandatory contributions to individual accounts (Feldstein 1997, 1999, 2005). Such proposals have, at least, the theoretical potential benefit of increasing national savings rates (although only if not offset by a high level of deficit spending in the general federal budget). Advocates of such proposals often focus on the labor market effects of the taxes needed to fund government health care programs. However, such approaches do not address the underlying issues of health care system inefficiency and pricing but simply shift the incidence of the cost. By moving away from a single-payer design toward a more-fragmented approach, such variations on the privatization theme may actually contribute to inflation of health care prices. This problem is even more apparent in the related “Health Savings Account” approach, which further fragments consumers’ buying power and ability to collectively negotiate lower prices from providers.

Health savings accounts and kindred models designed to shift more of the cost to the consumer until a high deductible is reached, are advocated in part on the grounds that they will constrain utilization through pocketbook pain. However, significant savings from decreased utilization in such approaches is unlikely, because most health care spending is incurred by the small percentage of beneficiaries who experience severe illness in a given year (Bodenheimer 2005a) and because so much of health care spending (especially during acute health care crises) is driven by provider rather than consumer actions. Increased cost-sharing is more likely to reduce receipt of routine primary or secondary preventive care than the cost to treat acute events such as heart attacks and strokes. Deferred preventive care may, indeed, ulti-

mately increase Medicare costs, as suggested by a 2007 study that examined Medicare costs after age 65 for beneficiaries with chronic illnesses who had been uninsured before reaching the age of Medicare eligibility. Expenditures were compared to those of medically similar beneficiaries who had not been previously uninsured. Once they became eligible for Medicare, those who were previously uninsured reported more doctor visits (13 per cent relative difference, $P=0.04$), more hospitalizations (20 per cent relative difference, $P=0.04$) and higher total medical expenditures (51 per cent relative difference, $P=0.09$) from ages 65 to 72 years than previously insured adults (McWilliams et al. 2007).

Thus, unless “consumer-driven” reforms reduced the price paid to providers for each unit of health care, reduced administrative costs, or increased the provision of primary and secondary preventive services that substantially reduce the need for acute health care – none of which appears likely with existing models – they would do little to reduce the overall societal cost of health care for an aging population. More likely, the defined-contribution approach would simply shift the incidence of the cost from the collectivity to the individual, probably exacerbating existing inequities in the process. To the extent that care is moved from the existing quasi-single-payer Medicare model to a panoply of separately marketed plans, it might increase the financial drag imposed by the high administrative costs prevalent in the U.S. health care system.

Shifting more of the costs to the consumer, therefore, is unlikely to provide much of a solution to the overall societal problem of health care cost burden and could easily exacerbate the problem. A shift in this direction large enough to significantly impact utilization would create the prospect of financial ruin for those elderly who experience major illnesses with catastrophic costs, with impact that would spill over to their families (it is worth noting in this regard that protecting family members from the costs of their elderly relatives’ care was a major original purpose both of Social Security and of Medicare). On the other hand, if existing health care arrangements are taken as a given, addressing the projected health care costs of an aging population in the U.S. through the public sector would indeed require some combination of increased federal revenues (e.g., taxes),

reductions in health care spending, or reductions in other programs (Gokhale 1998; Gokhale and Smetters 2003; Gokhale 2004). For example, in 2006, Federal Reserve Chairman Ben Bernanke estimated that if the government were to finance projected entitlement spending for Medicare and Social Security during the baby boomers' retirement years entirely by revenue increases, the taxes collected would have to rise from about 18 per cent of gross domestic product to about 24 per cent in 2030 (Aversa 2006), a level closer to that of other developed countries than is currently the case. Restoring federal revenues to the levels of the 1998–2000 period, when federal revenues ranged from 20.0 to 20.9 per cent of GDP (Office of Management and Budget 2007), would fill a significant portion of the long-term gap. However, tax-cutting has been a politically potent theme in recent U.S. history, so it is unclear to what extent it will be possible for federal revenues to be increased to address increasing societal needs resulting from population aging.

Ultimately, the societal cost of health care for a given population, such as the future United States elderly, will reflect the quantity of services used multiplied by the prices paid to providers, plus the administrative costs of managing the system. Thus, for the U.S., a third alternative to simply shifting costs within the existing system – either by increasing public funding or shifting costs to consumers – would be structural reforms that would more effectively constrain prices and administrative costs. However, this approach may be the most politically challenging of all the available alternatives, because of the established economic interests it would threaten, including the insurance industry; hospital, physician and other health care provider interests; prescription drug and medical device manufacturers; and other components of the “medical-industrial complex.” In addition, although opinions of the public and even many large employers may have become more receptive to public-sector, universal-coverage solutions in recent years as the problems of the existing system have become more burdensome, public skepticism of such approaches remains a major barrier to such solutions.

Finally, if none of these approaches offers a solution, explicit rationing of health care for the frail elderly – as opposed to the implicit rationing for some beneficiaries incorporated into current policies – remains

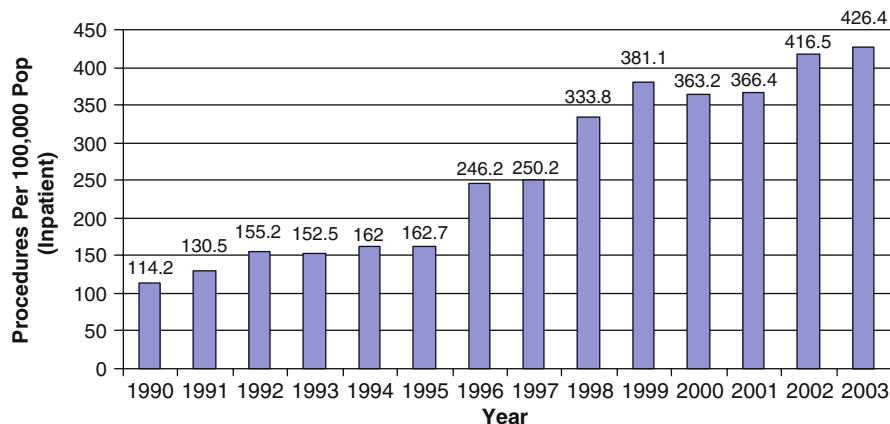
an alternative. Callahan (1987), for example, has proposed that government-financed health care should be rationed to those above the age of 80, a “natural life span”, past which life-extending technology should no longer be offered (Uhlenberg 1992). However, it appears unlikely that this solution would attain wide acceptance in American society.

The Role of Technology

Adding to (and, indeed, multiplying) the effects of price trends and administrative costs discussed above, technological intensification of health care is a major driving force both for recent increases in health care costs and those anticipated in the future. Newhouse (1992) argued that much of the increase in the costs of medical care has been due to technical change. As Pauly (2004), Reinhardt (2003) and Lee and Skinner (1999), among others, have shown, technological intensification affects health care expenditures more dramatically than population aging. Fuchs (2000), for example, pointed to the high rate of increase in per capita expenditures within elderly age groups during the 1980s and 1990s, which far exceeded changes in the number or proportion of elderly. Overall, while growth in U.S. health expenditures has been in the 7 per cent per year range in recent years (Heffler et al. 2005), population aging has accounted for at most 0.5 per cent per year. Despite variations in modeling assumptions, there is substantial agreement that the effect of population aging on future health expenditures is in the 4–6 per cent per year range, a small fraction of projected cost increases.

New health care products and services – including newly licensed prescription drugs, devices such as coronary stents and implantable cardiac defibrillators, high-tech diagnostic imaging, and many others – are often the most profitable and heavily marketed health care interventions. Managing technology, rather than being managed by it, will be a major health care system challenge for all nations in the decades to come. Vulnerability to exponential technology-driven cost increases is likely to be greatest in systems that are fragmented, have few tools for imposing expenditure constraints that do not simply shift costs elsewhere, and are characterized by limited power of buyers relative to sellers in the ongoing

Fig. 27.7 Percutaneous coronary interventions in the U.S. (PTCA and Stenting) per 100,000 population (inpatient)



Source: OECD Data, 2006.

tug-of-war over the prices of health care services and products. Thus, the question is not whether new health care technology contributes to increasing health care costs – clearly it does – but how well different national health care structures, ranging from classic single-payer systems like the British model to the highly fragmented system in the United States, are able to manage these forces. Cross-national comparisons in the years to come will reflect the results of a massive “natural experiment” examining this question. In this context, once again, population aging is simply one of several determinants of health care expenditure, and not necessarily even the dominant one.

Some new health care technology provides real clinical value, some is of marginal effectiveness, and some can actually turn out to be harmful once it is implemented in large, diverse populations that often differ from those used in premarketing trials. In public policy environments of high expenditures on health care marketing (including, in the U.S., heavy direct-to-consumer advertising), few restraints on pricing of new health care products, and strong incentives to physicians to utilize the newest technology in preference to well-established older treatments, the latest technologies are often adopted at a rate that exceeds what is clinically desirable or cost-effective. For example, in the case of pharmaceuticals, once a drug comes off patent and lower-cost generic substitutes become available, manufacturers often introduce a new, minor but patentable variation on the older drug and shift their marketing investments from the old to the new one.

In many areas of therapeutics, the diffusion of new treatments often brings with it technological cost spirals that extend well beyond these direct costs of the new treat-

ments themselves to such things as increased demand for diagnostic tests and medical monitoring of treatment regimens. For example, the popularity of arthroscopic knee surgery fuels demand for magnetic resonance imaging (MRI) of aching knee joints. Conversely, developments in diagnostic technology fuel demand for more-invasive procedures; e.g., MRI screening for lung cancer generates high rates of biopsies, often of benign lesions. Expanded treatment brings with it costs for therapy of treatment side effects; for example, increasingly-aggressive use of chemotherapy even after earlier treatment rounds have failed brings with it the cost of medications for treatment-induced nausea, anemia and other side effects. Side effects of new medications are often greater than those seen in preapproval clinical trials on selected patients in selected settings by selected physicians, and often require management with additional medications, particularly in the elderly population.

Developments in care for cardiovascular conditions, the leading cause of death and a major focus of health care for aging populations, are emblematic of technological intensification. For example, the growth of percutaneous coronary angiography (PTCA) and coronary artery stenting in the U.S. is shown in Fig. 27.7.

The Role of Trends in Fertility, Mortality and Age-Specific Disability

Discussions of demographic impact on health costs have typically focused on relative cohort size (e.g., the large size of the boomer cohort), but fertility dif-

ferences (and immigration) are also important (Lee 2001; Lee and Edwards 2001; Weiner and Tilly 2002; Uhlenberg 1992). Holding the mortality rate constant, lower fertility rates increase the fraction of the population past any given age, including retirement age, thus increasing the elderly dependency burden. However, they simultaneously decrease the proportion of the population below any given age, including age 20, which determines the dependency burden for children and youth, another group that is typically not in the workforce. Thus, under plausible assumptions, the total dependency burden in the U.S. may have fallen between 1950 and 1965 and then trended upward, returning to its 1950 level by 2015. In general, the dependency ratio will be influenced by assumptions about the fertility rate; the consumption requirements of a child compared to an adult; the age-specific labor force participation rates, which are falling overall for men but rising for women and older men; the decline in age-specific mortality rates; and the rate of wage growth. If the burden of each cohort is measured by the ratio of a birth cohort's lifetime consumption to lifetime gross wages, under plausible assumptions population aging may have reduced the lifetime consumption sacrifice each generation must make to support other generations (Burtless 2002).

Holding the fertility rate constant, declining morbidity and mortality impacts population aging and the relationship between population aging and health care costs (Lee 2001; Lee and Edwards 2001). While some argue that cost reductions due to declining morbidity and mortality are small relative to the additional costs resulting from population aging (Miller 2001), Lubitz, Beebe and Baker (1995) found that an 8 per cent increase in lifespan past age 65 resulted in only a 2 per cent increase in Medicare spending. This is because, while health care expenditures rise with age, this is largely due to the impact of end-of-life costs. These tend to take place at late ages but occur only once for each person. Thus, declining mortality is associated with cost reductions at earlier ages because it postpones these costs (Hoover et al. 2002).

Some have suggested that future declines in rates of late-life disability might be able to offset any projected increases in health care expenditures resulting from the aging of the baby boom generation (Singer and Mantton 1998; Weiner and Tilly 2002). The consensus to date suggests that there has been a decline in disability prevalence of about 1–2 per cent per year (Freedman et al. 2002). However, most of this decline has been in

the proportion of older adults needing help with instrumental activities of daily living (IADLs), such as shopping, managing money and doing laundry (Freedman et al. 2002; Spillman 2004). Declines in more severe and more costly activity of daily living (ADL) disability, such as needing help with bathing, dressing and eating, have been much smaller (Freedman 2005; Freedman et al. 2004, 2002).

It has also been noted that the baby boom generation differs from preceding generations in ways other than cohort size, which might influence their health care consumption (Crystal 2007). They have substantial, though unequally distributed economic resources (Crystal and Shea 1990; Crystal 2006), smaller family size, and a more consumerist attitude, all of which may increase their per capita demand for health care. Conversely, they are better educated and may have lower rates of disability than previous cohorts, which might reduce their demand. Ultimately, however, the effects of demographic changes are likely to be dwarfed by those of increases in the per person costs of care. Thus, the future sustainability of existing benefit systems is likely to depend less on the characteristics of the baby boom cohort than on other factors (Crystal 2007).

Reinhardt (2003) observes that while the increase in the old-age dependency ratio will require a gradual increase in the proportion of the nation's output of real goods and services allocated to the elderly, the projected difficulty in funding this increase in the United States is due to contemporary fiscal policy, not the aging of the population. In 2001, the U.S. federal government had a budget surplus that included accumulated surpluses in the Social Security and Medicare trust funds. If policies had been maintained from that point forward that continued budget surpluses, or even rough budget balance, this would have contributed to the investment in the real economy – the capital stock and the productivity of future workers – that will be needed to support the needs of an aging population in the future. However, fiscal policies implemented since 2001 – notably, the large tax cuts of the early 2000s – generated very large deficits in the general budget that, in effect, much more than offset the surpluses in the Social Security and Medicare trust funds. This negated the positive effects of Social Security and Medicare “prefunding” from the standpoint of the real economy and the overall debt obligations incurred by government, to be paid for by the postboomer cohort at the same time that it is supporting the needs of the elderly boomers.

Public and Private Roles in Organizing and Financing Health Care for the Elderly

As they address cost pressures related to population aging and other factors such as technological intensification, nations confront choices between strategies oriented to the private and to the public sector. In most of the developed countries, the public sector plays the largest role; however, as Fig. 27.4 indicates, there remains significant variation. As future policies are considered, there is widespread interest in the potential of private-sector solutions. It is therefore of considerable importance, in thinking about the health policy choices faced by nations as they confront the increasing impact of population aging, to consider the potential impact of privatization versus public-sector strategies, in the light of cross-national experience to date – and in particular the relevance of the United States model.

In many other areas of economic life in the developed countries, reforms have sought to enhance the role of private-sector, market-oriented structures – for example, state-owned enterprises have been privatized in many of the European countries. Why, then, does health care seem to be different, at least as suggested by Fig. 27.5?

One fundamental difference between health care and other areas of the economy, across the developed countries, is that most of the cost of services utilized does not fall upon the user. This has powerful consequences both for utilization by the consumer and for pricing by the provider and fundamentally changes the economic dynamics under which “normal” markets operate. Consumers are able to utilize services that they could not otherwise afford (and which, absent insurance, might be lower in priority for them than other goods and services), and providers’ prices are not constrained by the ability of individual consumers to purchase their services.

The separate incidence of use and cost is, in the parlance of the software industry, not a bug but a feature, reflecting values that are widely shared across the advanced societies. Despite different financing arrangements, policies in all the OECD countries treat access to a basic level of adequate health care as an important societal goal. Put plainly, denying urgently needed health care to sick citizens who lack the means

to pay for it is not politically acceptable in any of the advanced countries. Systems of public and/or private insurance have developed in all the higher-income countries, covering the majority of health care expenditures. In addition, even where populations exist who are uninsured and indigent, services are provided to these individuals through systems of safety-net providers, charity care and cost-shifting from the uninsured to the insured, particularly for the most acute (and costly) services such as emergency room visits and inpatient hospitalization. Such individuals often fail to receive consistent outpatient care for health conditions they may have, or health screening and preventive services, but once they fall seriously ill, they do receive acute care services, with much of the cost shifted to others.

Therefore, in contrast to most other goods and services in the economy, the incidence of health care expenditures falls mainly on third parties rather than on the user. The highly skewed distribution of health service utilization in all countries further limits the feasible extent of cost-shifting to individual patients as a way of constraining prices through “normal” processes. Among developed democracies, no examples exist of health care markets that operate according to classical Adam Smith supply and demand principles, where prices are constrained to an efficient level by the unwillingness or inability of consumers to utilize services that they cannot afford from their own resources.

Other inherent features of health care further limit the applicability of classical economic models to health care systems. For example, consumers rely on professional intermediaries to make treatment decisions on their behalf based on expert knowledge and professional standards, so that many decisions about utilization are made by physicians rather than patients. Individual consumers are poorly situated to evaluate quality and depend, again, on professionals to make treatment referrals on their behalf (nor can this fact easily be changed by efforts to develop public measures of providers’ quality, which tend to be simplistic, “lowest common denominator” measures of complex realities). Consumers are no better situated to negotiate prices with providers and indeed, prices are typically not known until after services are utilized. Prices for services used on a self-pay basis are generally substantially higher than those that are centrally negotiated. Even to the extent that consumers share in the costs of services, elasticity of demand is low given the

importance that individuals attach to their health and the uncertainties as to which services are truly crucial for outcomes.

Under these circumstances, the efficacy of “classical” constraints on health care utilization and prices is limited in all countries, and the “supply side” of the market is insulated from normal market forces in ways that do not apply to most other areas of the economy. This creates an upward bias on health care prices that national health care systems seek to counterbalance in various ways, using aggregated purchasing power of large numbers of consumers. In national health systems in which the national government is the direct purchaser of health care (for example, the British system), the demand side of the market is represented by a strong monopsonistic buyer, which seeks to set payments high enough to assure adequate supply (for example, to attract capable physicians to the profession), while limiting aggregate costs to a level considered acceptable in the light of other needs. In other cases, subnational levels of government (such as Canadian provinces) or state-regulated, quasi-public health funds (such as the German sickness funds) play a similar role as monopsonistic, or oligopsonistic, payers (Reinhardt et al. 2004).

Under such arrangements, health budgets and payment levels for key services such as physician visits are the subject of annual negotiations that include representatives of national government, key intermediaries such as Social Security or sickness funds, provider associations and other stakeholders. Such processes balance an array of competing pressures including providers’ demands (and, occasionally, direct or indirect threats to withhold services), governmental budget constraints and political considerations (such as pressures to eliminate waiting lists). Policies governing the extent to which providers can “balance bill” patients for charges beyond those in approved fee schedules are also frequently part of such negotiations, and often help to distinguish “firmer” from “softer” models of price negotiation.

In circumstances in which the public sector plays a more limited role, as in the United States, where management of the health care system and purchasing of health care services is fragmented among many entities, with no single locus of responsibility with the mandate or ability to set and enforce global budgets or to enforce uniform fee schedules, one would predict that providers would possess stronger pricing power than in systems with more central regulation. Such sys-

tems would be expected to result in higher prices for a given unit of health care services or products, consistent with what is observed (Reinhardt et al. 2004). It should be noted that in the United States, while Medicare has some “single-payer” features, it must compete with private insurance for providers’ services in the larger medical marketplace, and also that in important areas such as prescription drug coverage, Medicare has been prohibited by Congress from negotiating prices centrally. In addition, while the traditional or “original” Medicare system is a government-administered, defined-benefit, fee-for-service program, it also includes a substantial “Medicare Advantage” portion administered by private insurance plans.

The fragmentation of health care purchasing in the United States is among the key reasons for this nation’s outlier status in terms of expenditures, whether measured in purchasing-power-adjusted dollars or as a share of GDP. Fragmentation results in higher prices for the same service and this (rather than differences in utilization) is what mainly distinguishes the U.S. system (Anderson et al. 2003). Largely as a result of these price differences, the U.S. actually incurs public-sector expenditures that exceed the OECD median (\$2,051 versus \$1,502 in 2000, adjusting for purchasing power of currencies; Anderson et al. 2003). This is the case even though the public sector pays for a much smaller share of the total than in other OECD countries and the lack of health coverage for a large population of uninsured citizens. Even as a percentage of the larger U.S. GDP, public-sector expenditures were comparable to those in other OECD countries (5.8 per cent of GDP in 2000, vs an OECD median of 5.9 per cent). In the private sector, by contrast, the median OECD nation spent 2 per cent of GDP on privately financed health care in the year 2000 versus 7.2 per cent in the U.S. In 2003, private-sector spending in the U.S. reached 8.4 per cent of GDP (see Fig. 27.5). (Source: OECD Data 2006).

In addition to higher health care prices, the privatized approach taken by the U.S. results in far higher administrative costs than in other OECD nations. Davis and Cooper (2003) estimated that administrative expenses for private insurance in the U.S. are two and a half times higher than for public programs. Woolhandler, Campbell and Himmelstein (2003) estimated that administrative costs for insurers, employers and providers of health care in the U.S. were at least \$294.3 billion in 1999, or about 24 per cent of total U.S. health

spending (also reported in Bodenheimer 2005b). This estimate excluded the value of time spent by consumers. For 2002, OECD estimates of the per capita cost of health administration incurred by insurers, central and local authorities, and social security systems were as follows for selected large countries: United States, \$368; France, \$255; Germany, \$160; Canada, \$115; Australia, \$82; Japan, \$44; Sweden, \$12 (OECD Health Data 2006). Reinhardt (2003) reported that in a 1996 study, McKinsey Global Research Institute found, after adjusting for demographic characteristics and prices, Americans used \$390 less in health care services per capita than the Germans in 1990, but spent \$360 more on administration.

These comparisons reflect the fact that in the U.S., substantial administrative costs are incurred for functions that are not required in other systems or play a smaller role, such as complex coverage and eligibility determinations; medical billing in an environment in which a given service may be priced vastly differently across payers and consumers; multiple tiers of insurance “middlemen”; marketing and advertising costs; medical underwriting to determine whether coverage will be offered to an individual or preexisting conditions excluded; and many others. As a result, by one estimate, 31 per cent of health care spending in the United States goes to administrative costs (Woolhandler et al. 2003).

As single-payer advocates have argued, the cost-outlier status of United States health care is consistent with the view that market imperfections are so fundamental in the health care sector that a strong element of central regulation and monopsony or oligopsony – as in single-payer systems – is an essential element of efficient care that is affordable at the societal level. According to this view, single-payer systems are necessary to offset what is otherwise an inherent imbalance between provider and purchaser pricing power that takes place when the user is not the payer, as in all public and private insurance systems. This separation is essential unless sick people who are not rich are to be denied access to life-saving health care – an outcome that would violate widely held values in any developed country including the United States. Sales of corn, automobiles and ballpark tickets will decline as the price increases, constraining producers’ pricing decisions, but this is not necessarily the case for insured health services. Single-payer systems, and their oligopsonistic cousins, aggregate consumer pricing power to offset this effect through centralized rate

negotiations. Such systems also have more power than other models to regulate cost drivers such as capital expenditures and provider supply. As critics often point out, they can also be subject to pathologies of their own, such as waiting lists. A systematic discussion of these tradeoffs is beyond the scope of this chapter, although we discuss below some comparisons that suggest that access is not necessarily better in the mixed U.S. system than in other systems.

Market-based rhetoric on health care policies seldom fully comes to grip with the contradiction between traditional market models and the fact that whether public or private, insurance coverage insulates the consumer of the service from its cost. Whether the service in question is physician care, hospital care or pharmaceuticals, providers of health care goods and services in the United States have historically strongly opposed strong government influence in setting or negotiating health care prices as an unjust exercise of power. In contrast, single-payer advocates often argue that freeing providers to “negotiate” their own prices in a marketplace that is so distorted by public and private insurance coverage, information asymmetries, and numerous other distortions represents “unilateral disarmament” on the part of payers.

Utilizing a variety of cost management tools made possible by the more prominent role of governmental and quasi-governmental actors in the health care system, most nations at a comparable stage of economic development to the United States engage in prospective budgeting of health care to a much larger extent than is the case in the U.S. (Marmor and Oberlander 1998). On a national level, target expenditures for particular sectors of the health care system are often set prospectively as part of a global budgeting process – for example, a target may be set for physician reimbursement. Budget targets are often challenged, either by direct political opposition or by changes in provider behavior (e.g., increases in volume of services billed), but national health systems have typically been much more successful in these efforts in other countries than the United States. Hospitals as well (which are more often operated by public-sector organizations than in the U.S., and seldom operated as part of for-profit chains) are also more likely to have fixed budgets that limit expenditures, and capital investments are more closely regulated. Prescription drugs, whose prices are typically negotiated centrally by national health plans in nations with such plans, are also less expensive in most national health systems than in the U.S.

Private-Sector and Public-Sector Roles within Medicare

Within the U.S., most medical care for the elderly is paid for by the Medicare program, which occupies a contested and somewhat anomalous position within the overall health care system. As of 2006, about 81 per cent of participants were enrolled in the traditional fee-for-service portion of the program, under which most medical care expenditures are paid directly by the federal government at rates set by Medicare, through a complex process that includes considerable negotiation with provider organizations and substantial political oversight. For example, in several recent years, Congress has intervened to prevent reductions in reimbursement rates for physicians. In principle, because it aggregates purchasing power on behalf of more than 40 million enrollees, the traditional Medicare system is well-positioned to purchase health care services cost-efficiently. However, it operates under many economic and political constraints in doing so. Despite its scale, it is only one of several payers in the medical marketplace and must compete with other payers for the services of providers. Perhaps, more important are the political constraints. Notably, for example, when prescription drug coverage was added for participants in traditional Medicare, Congress prohibited the government from negotiating drug prices directly on behalf of all its beneficiaries.

About 19 per cent of Medicare participants are enrolled in managed care programs (mainly those that constitute the Medicare Advantage program). Managed care enrollment had declined during the late 1990s but increased from its 2004 nadir of 13 per cent as a result of Congressional actions to increase reimbursements to the plans. In these plans, the responsibility for negotiating payment rates and paying providers is shifted from the federal government to private plans, which has been ideologically preferable for many national elected officials, particularly Congressional and administration Republicans, who have sought to increase enrollment, with the goal of shifting the program to one that more closely resembles the “mainstream” of employment-based health plans. The assumption has been made that such a shift would eventually help to control Medicare costs. However, the Medicare managed care program has never succeeded in its original goal of saving money,

and per capita payments to plans over the years have consistently exceeded by a substantial margin the estimated cost to Medicare if their enrollees had remained in the traditional program. This “Medicare Advantage” in payment proved to be necessary in order to induce insurers to offer the plans; to cover their added administrative and marketing costs; and to add features (such as lower copayments) necessary to induce beneficiaries to enroll. In 2007, the Congressional Budget Office (CBO) estimated that it costs the government about 12 per cent more for each managed care enrollee than would have been expended had the enrollee remained in the traditional Medicare system (CBO 2007). Congressional actions to expand the role of private plans, even at increased cost, have been described by columnist Paul Krugman (2005) as a policy of “gratuitous privatization”, characterized as insistence on a role for private intermediaries whether or not they contribute to cost-efficient provision of services.

The controversy over Medicare privatization is thus one of a number of policy variables that will shape the governmental cost burden for health care for the U.S. elderly in both the short and longer term – independent from, though interacting with, the impact of population aging. Congressional testimony by CBO in 2007 noted that the faster than projected increase in managed care enrollment since 2004 had increased net Medicare spending, and estimated that Medicare could save \$149 billion over the 2009–2017 period by reducing county-level benchmarks for managed care premiums to the level of local per capita spending in the fee for service program. Such a policy would still generate a “Medicare Advantage” to private plans, since they tend to attract a healthier population than the fee-for-service program, but the margin would be substantially reduced. CBO estimated, however, that this change would discourage plan and enrollee participation, leaving enrollment in 2012 at about the 2004 level of 13 per cent.

Utilization and Supply of Health Resources

It is often suggested that it is overutilization that explains high U.S. health care costs. However, cross-national comparisons suggest that utilization of most

health care services is not particularly high in the U.S. compared to other countries. For example, Anderson et al. (2003) found that the U.S. has fewer physicians and physician visits per capita, and fewer hospital admissions, acute care beds, and acute care days per capita, than the median OECD nation. Based on economic analyses by McKinsey Global Institute, they estimated that Americans spent about 66 per cent more per capita on health care than Germans, but received 15 per cent fewer real health care resources, and that the U.S. health care system used 30 per cent more real resources per capita than the British, but spent 75 per cent more per capita as a result of higher prices. Although supporters of the privatized model often assert that access to care is much more restricted in countries where the public sector plays a more dominant role (Carroll et al. 1995; Dirnfeld 1996), health maintenance organizations and other private health plans in the U.S. have hardly been loath to impose restrictions on access to providers and, indeed, have marketed themselves to private payers as gatekeepers. High health care prices and consequent cost pressures have often led to greater intrusiveness in access for individuals than characterizes many systems that are more closely regulated by government.

The fragmented organization of U.S. health care financing results in fewer real resources devoted to health care than the high expenditures would suggest. In 1996 the U.S. had 2.6 physicians per 1,000, which was close to the OECD median of 2.8 (Anderson and Poullier 1999). However, by 2001 many industrialized nations had more physicians and nurses per capita than the U.S. In 2001, the U.S. nurse-to-population ratio of 8.1 per 1,000 was below the OECD median of 9.0. The U.S. physician-to-population ratio of 2.7 per 1,000 was below the OECD median of 3.1. U.S. hospital beds per 1,000 were also below the OECD median, 2.9 per 1,000 as compared to 3.9 (Reinhardt et al. 2004). The U.S. did have more magnetic resonance imagers (MRIs) and computed tomography (CT) than the OECD median. However, Japan had three times as many MRI machines per capita as the U.S., more than six times as many CT scanners, and a rate of dialysis almost twice the U.S. rate, but spent 7.9 per cent of GDP on health care while the U.S. spent 14 per cent (Reinhardt et al. 2004). The number of physicians and nurses per 1,000 in 2003, among the 20 higher income countries in the OECD, is shown in Fig. 27.8a. The number of hospital beds

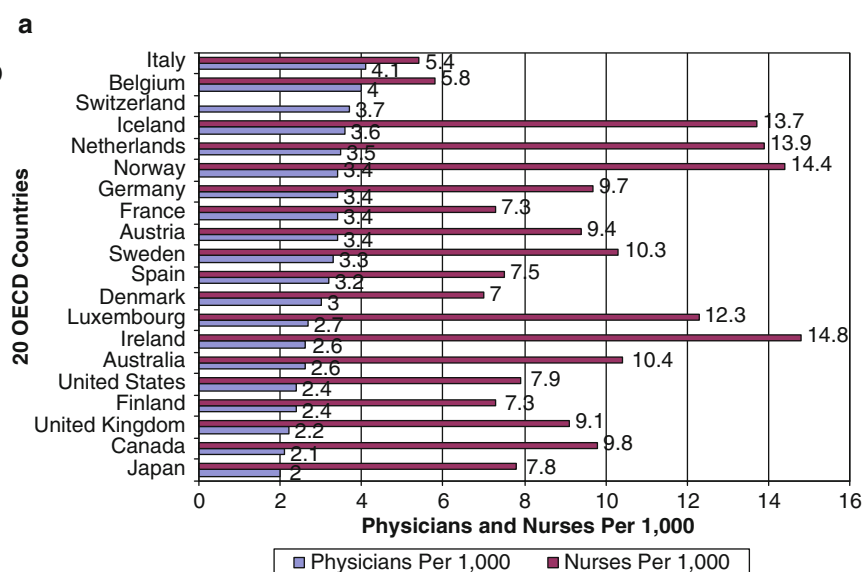
per 1,000 in the 20 high income OECD nations in 2003 is presented in Fig. 27.8b.

Cost comparisons for physician services are consistent with the theme that price differences, more than utilization differences, account for the high U.S. spending. The U.S. falls below the OECD median in supply of physicians and in per capita physician visits. However, in 1996 U.S. expenditures on physician services accounted for 19.5 per cent of total health care expenditures or \$761 per capita, versus an OECD median of 15.4 per cent or \$295 per capita. Japan had the second highest expenditures on physician services, \$542 per capita (Anderson and Poullier 1999).

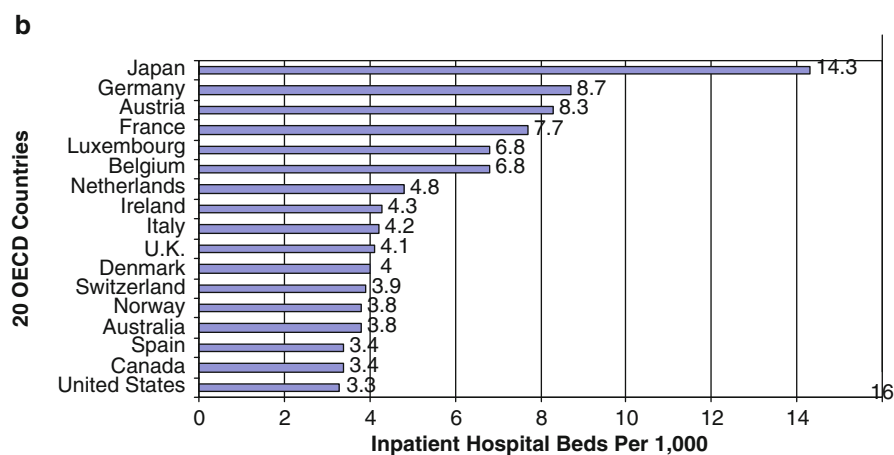
By 1999, U.S. expenditures on physician services accounted for 2.9 per cent of GDP, double the OECD median of 1.3 per cent. Per capita spending on physician services was \$988, the highest in the OECD, and far above the OECD median of \$342. Similarly, the U.S. spent an average of \$1,850 per acute hospital bed day in 1999, which was almost three times the OECD median and more than double the next highest, the Canadian average of \$788 (Reinhardt et al. 2004). Finally, despite the focus on the high cost of pharmaceuticals in the U.S., drugs accounted for 11 per cent of U.S. health spending in 1999, compared to an OECD median of 14.9 per cent. Nonetheless, since U.S. health spending was the highest in the OECD, per capita expenditures on pharmaceuticals were highest in the U.S. (Reinhardt et al. 2004). Throughout the OECD, the rapid rise in drug spending in recent years has been a key driver of the growth in total health care spending (OECD Health at a Glance 2005). Per capita expenditures on pharmaceuticals by the 20 wealthier OECD nations in 2003 are shown in Fig. 27.9.

One area of health policy in which none of the OECD nations provide a clear model is long-term care. While a trend toward deinstitutionalization of the elderly has occurred throughout the developed world, countries have differed in the degree of formal and informal home care and thus the explicit inclusion of these services in the costs of care. Among eight of the industrialized nations, Sweden had the highest proportion of the population age 65 or above in institutions in the year 2000, at 8.7 per cent. The U.K. had the lowest percentage in institutions at 5.1 per cent, followed by the U.S. at 5.7 per cent and then Japan, France, Australia, Germany and Canada. Publicly financed institutional care as a percentage of GDP in the year 2000 was highest in Sweden at 1.51 per cent and

Fig. 27.8 (a) Physicians and nurses per 1,000 (2003) (b) inpatient hospital beds per 1,000 (2003)



Source: OECD Data, 2006.
Data for Japan from 2002



Source: OECD Data, 2006.
Data for Finland, Iceland, and Sweden were not available

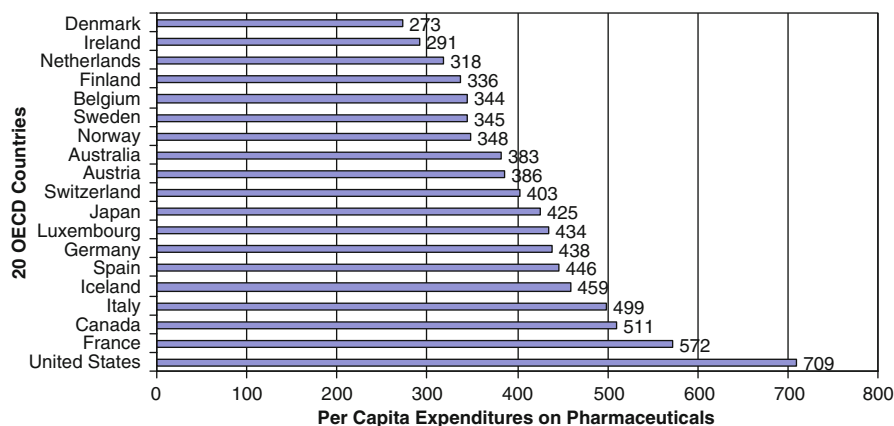
lowest in France at 0.37 per cent; followed by Germany (0.39 per cent), the U.S. (0.42 per cent), Canada (0.50 per cent), Japan and Australia (0.66 per cent), and the U.K. (0.69 per cent) (Jacobzone 2000).

Among these eight industrialized nations, the percentage of the population age 65 or above receiving publicly funded formal home care ranged from 5 per cent in Japan to 17 per cent in Canada. This percentage was second highest in the U.S. at 16 per cent. In the remaining five nations it ranged from 5.5 per cent in the U.K. to 11.7 per cent in Australia (Jacobzone 2000). The percentage of the population receiving publicly financed formal home care as a percentage of

GDP was lowest in Japan at 0.08 per cent, followed by Australia (0.15 per cent), Canada (0.21 per cent), France (0.23 per cent), U.S. (0.24 per cent), U.K. (0.31 per cent), Germany (0.32 per cent) and Sweden (1.35 per cent) (Jacobzone 2000).

Weiner and Tilly (2002) suggest that population aging may lead to a shift from acute illnesses to chronic diseases and disability, and this will increase the need for long-term care services, such as nursing homes, home health and personal care. If so, the consequent need to integrate medical and long-term care services will be more difficult in the U.S., where financing and delivery systems are more fragmented.

Fig. 27.9 Per capita expenditures on pharmaceuticals (2003)



Source: OECD Data, 2006.

Data for Australia, the Netherlands and the United States are from 2002

Data for the United Kingdom were not available

Access, Satisfaction and Outcomes

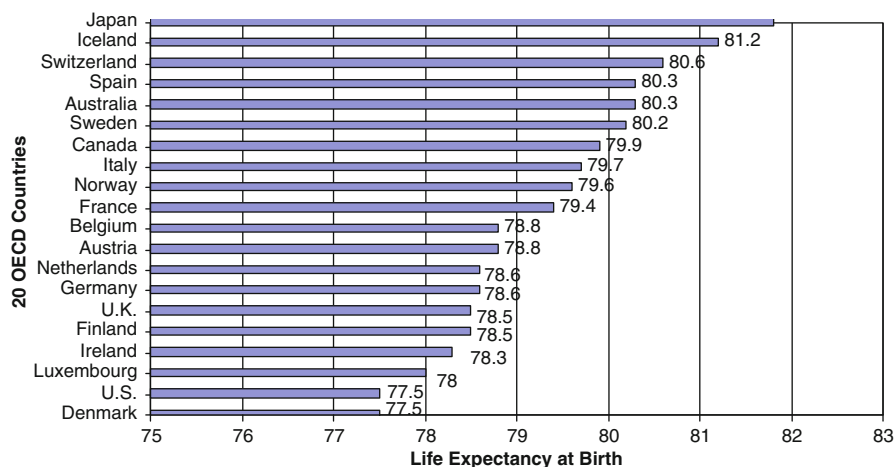
As populations age throughout the developed countries – and notwithstanding efforts in some countries to shift costs back to the individual consumer – it is likely that public payers will need to bear the principal brunt of the increased cost to care for these populations. Public insurance is nearly universal for the elderly; even in the United States, where a large uninsured population exists, coverage through the Medicare program has been extended to virtually all elderly since the program's creation in 1965. Most of the other wealthy OECD nations have attained universal coverage for those of all ages; where residual populations without public coverage exist, as in the Netherlands and Germany, they typically involve higher-income people who generally purchase private coverage.

In the United States, elected officials critical of the “single-payer” and defined-benefit aspects of the traditional Medicare program, frequently advocate that in the face of the oncoming baby-boom onslaught, there is a need for privatization measures that would make the program more similar to the private-insurance, employment-based models relied on by the working-age population. Quite apart from cost considerations, data on consumer satisfaction shed an interesting light on the viability of this approach. Overall, cross-national surveys, such as the Commonwealth Fund's 1998 International Health Policy Survey, indicate higher levels of dissatisfaction with the health care system in the United States than in other developed

countries. Particular issues that resulted in high levels of dissatisfaction with a country's health care system included high out of pocket costs, difficulties getting access to care and the perception that care is poor or inadequate (Davis 1999).

Among the U.S. elderly who receive public coverage through Medicare, satisfaction appears to be higher than among younger individuals, who mainly rely on private insurance (Davis et al. 2002). Elderly Medicare beneficiaries were 2.7 times more likely to rate their health insurance as excellent than the privately insured; Medicaid beneficiaries were 2.1 times more likely to do so. Elderly Medicare beneficiaries were also less likely to have negative experiences than the privately insured, and were more confident of their ability to get needed care in the future. Medicare beneficiaries had poorer health and lower incomes: they were more likely to pay more than \$500 a year out of pocket for health care and to spend more than 5 per cent of their income on medical expenses. Yet, they were less likely to report access problems resulting from costs and less likely to report problems paying medical bills. Controlling for income, health status and prescription drug coverage, they were one-third as likely as those with employer coverage to experience access problems due to cost (Davis et al. 2002).

It is often claimed that the United States model represents a trade-off in which higher quality is purchased for higher cost (Bush 2004). Yet despite its unusually high expenditures on health care, the U.S. ranks below the OECD median for many important health outcomes. For example, for life expectancy at birth, the U.S. was in the bottom quartile of the 29 industrialized

Fig. 27.10 Years of life expectancy at birth (2003)

Source: OECD Data, 2006.

nations in the OECD in 1995 and its relative ranking had been declining since 1960 (Anderson 1997). For most available outcome measures, the U.S. ranked in the lower half of OECD countries in 1996 and the rate of improvement for most measures was slower than for the median OECD country. (Anderson et al. 2000; Anderson and Poullier 1999) Life expectancy in the U.S. was lower than the OECD median for both men and women.

In 1999, U.S. life expectancy at birth was slightly below the OECD median for both men and women, and life expectancy at age 60 matched the OECD median. In the year 2000, life expectancy at birth was 76.8 years in the U.S., below life expectancy in Japan (81.2), Sweden (79.7), Canada (79.4), France (79), Germany (77.7) and the UK (77.8) (Walker 2004). Cross-national data on life expectancy in 2003 are shown in Fig. 27.10.

The shorter life span in the U.S. than in other industrialized nations could be a consequence of premature mortality. This is defined by the OECD as mortality that occurs below the age of 70 for reasons that are considered preventable if appropriate medical care had been provided (Reinhardt et al. 2002). The term “potential years of life lost” thus measures the number of years before age 70 that a person died from causes that could have been prevented. In the U.S., potential years of life lost per 100,000 life years in 1995 were 4,591 for women and 8,401 for men. This exceeded the OECD median of 3,256 life years for women and 6,281 life years for men (Anderson and Poullier 1999). Reinhardt, Hussey and Anderson (2002) reported that potential years of life lost due

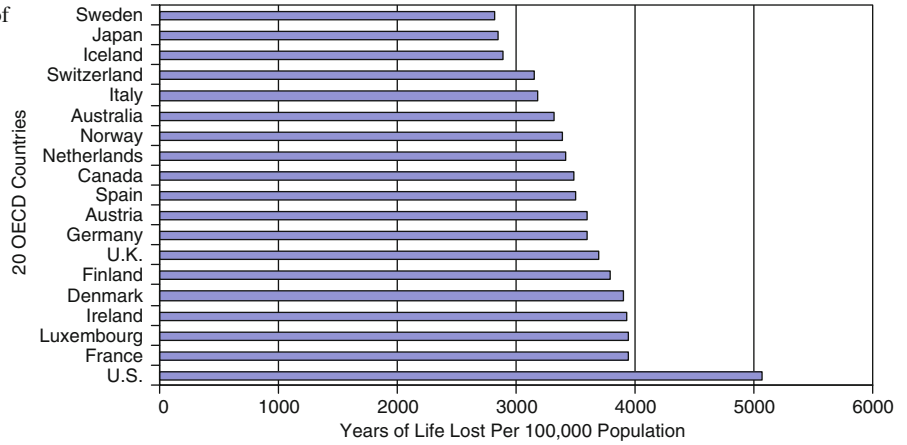
to premature mortality in the U.S. were significantly higher than the OECD median for both men and women in 1999. Preventable years of life lost in the 19 higher income OECD nations with available data in 2002, are presented in Fig. 27.11.

The higher rate of preventable years of life lost in the U.S. probably reflects multiple health care access, social, and health behavior factors, whose roles are difficult to disaggregate. Health behaviors likely play an important role, but their role in cross-national health differences is complex. For example, smoking and obesity, two important factors related to health behavior that have major impact on health outcomes, differ in their cross-national patterns. In the U.S., public health policies at the federal, state and local levels resulted in a dramatic reduction in the proportion of the population that smokes tobacco. The proportion of the population that smoked at least one cigarette a day in the U.S. declined from 30.1 per cent in 1985 to 17 per cent in 2004. Data on the percentage of the population smoking daily in 2003 in the higher income OECD nations with available data are shown in Fig. 27.12a (OECD 2005).

In contrast, the cross-national pattern for obesity rates is quite different. The proportion of the population that is overweight (BMI > 25) or obese (BMI > 30) in the U.S. is the highest among OECD nations with data available (OECD Health at a Glance 2005). Rates of obesity in 2002–2003 in high income OECD countries with available data are shown in Fig. 27.12b.

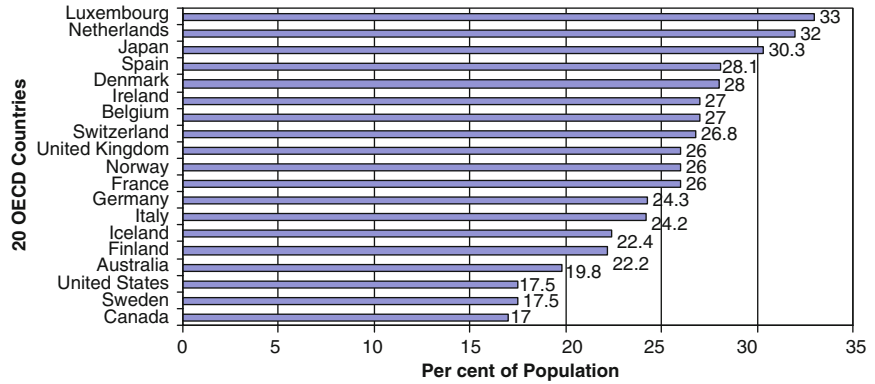
In light of the high obesity rates in the U.S., it is perhaps unsurprising that mortality rates from diseases related to obesity are high. For example, of

Fig. 27.11 Preventable years of life lost before age 70 (2002)



Source: OECD Data, 2006.
Data for Belgium were unavailable

a



Source: OECD Data, 2006.
Data for France, Ireland, and Switzerland are from 2002
Data for Australia are from 2001
Data on Austria were unavailable

b

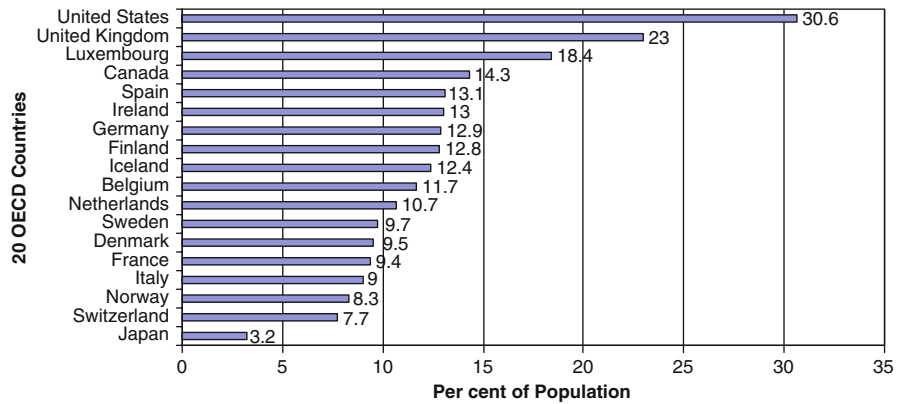
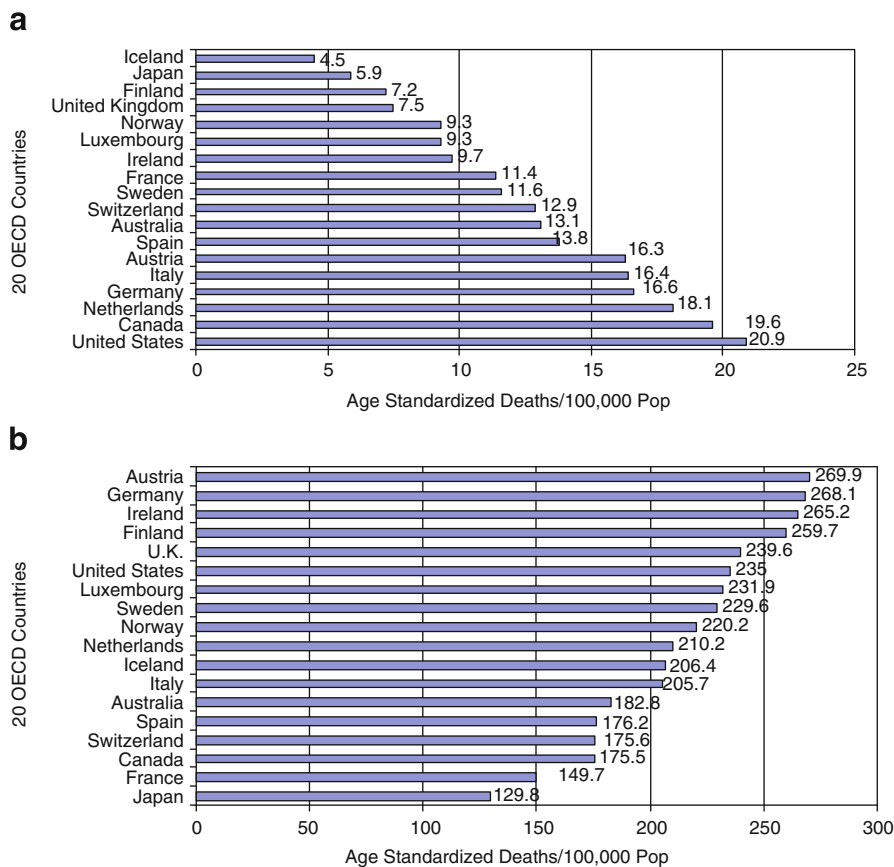


Fig. 27.12 (a) Per cent of population smoking daily (2003) (b) per cent of population obese (2002–2003)

Source: OECD Data, 2006.
Data for Belgium are from 2001
Data from Denmark are from 2000
Data on Australia and Austria were unavailable

Fig. 27.13 (a) Age standardized deaths/100,000 due to diabetes (2002) (b) age standardized deaths/100,000 due to circulatory system diseases (2002)



Source: OECD Data, 2006.

Data for Belgium and Denmark were unavailable

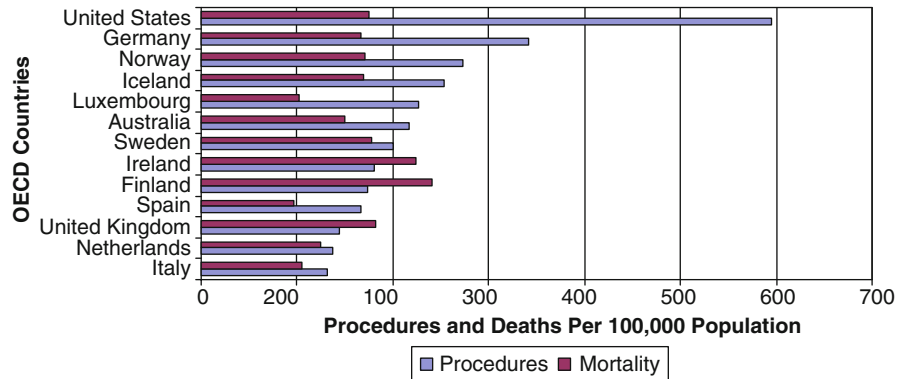
the 20 wealthiest OECD countries, age standardized deaths per 100,000 from diabetes mellitus were highest in the U.S. in 2002 (see Fig. 27.13a). Expenditures on health care for diseases related to obesity were also high. Estimates from the U.S. indicate that the costs of health care services were 36 per cent higher and the cost of medication 77 per cent higher for obese people than for people of normal weight (Sturm 2002). Since there is a several year time lag between the onset of obesity and related health problems, the increase in obesity in most OECD nations over the past two decades is likely to lead to higher future health care costs (OECD 2005).

In 2001–2002, cardiovascular diseases were the leading cause of death in all OECD countries except Japan and France, where cancer had become the main cause of mortality. In most OECD countries, between one-third and one-half of all deaths were due to cardiovascular diseases (see Fig. 27.13b).

While heart disease is the leading cause of death in most OECD countries, there is little correlation between mortality rates from heart disease in these countries and their use of cardio-vascular procedures. Coronary artery bypass graft (CABG) and coronary angioplasty (PTCA for percutaneous transluminal coronary angioplasty) have transformed the treatment of heart disease in recent decades. The U.S. has the highest rate of use of these procedures, yet its mortality from heart disease is above the OECD median (see Fig. 27.14).

Nonetheless, despite discontent with the U.S. health care system and its seemingly poor outcomes given its exceptionally high expenditures, a higher proportion of Americans age 65 and above perceive their health status to be excellent or good than in most OECD nations with available data. In 2004, 73 per cent of older Americans perceived their health status to be excellent or good. Among nations with data available for any year between 2002 and 2004,

Fig. 27.14 Coronary bypass or angioplasty and mortality from ischaemic heart disease or acute myocardial infarction (2002)



Source: OECD Data, 2006.

Data for Austria, Belgium, Canada, Denmark, France, Japan, and Switzerland were unavailable

only Switzerland, New Zealand and Luxembourg had higher rates.

Conclusion

In light of these comparisons, what conclusions are suggested about the relationship between population aging and the burden of health care costs, and what is implied about the sustainability of public commitments for health benefits for the elderly in developed countries as their populations age? Several caveats are essential at this point. Cross-national comparisons are inherently limited; the number of ways in which nations vary far exceeds the number of cases, and each country represents in many ways a unique case with respect to health policies and structures. Nevertheless, these comparisons suggest that population aging per se is only one of many factors that determine the cost burden of health care for a society, and not necessarily even the most important of these.

Ceteris paribus, increases in the proportion of a society's population that is elderly will increase the cost burden; but *ceteris* is seldom *paribus*. For example, among the high-income countries, there is little correlation between the proportion of elderly in the population and the share of gross domestic product spent on health care. Our analysis suggests that across countries, policy choices concerning the way in which health care is organized and financed are at least as important as demographics in shaping societal cost burden. From the U.S. perspective, this

analysis suggests that the crisis of "sustainability" of health benefits for the elderly has more to do with the internationally idiosyncratic and remarkably inefficient structure of U.S. health care financing and delivery systems than with the coming aging of the population.

Quite independent of population aging, increases in the cost of health care that exceed those in other areas of the economy are typical across nations with diverse health care systems. In all OECD nations in the early 2000s, growth in public expenditures on health exceeded GNP growth. However, in many countries such as the United Kingdom and Canada, these increases were intentional measures to relieve demand pressures resulting from cost containment in the mid-1990s. More recently, health expenditure growth has slowed in most OECD nations. Nonetheless, throughout the OECD, nations are studying and often modifying the structure and function of their health care delivery system and ultimately their health policies. As medical practice norms change, innovations in medical technology are introduced, and health care administration and payment mechanisms are reformed, nations across the globe are searching for a more efficient allocation of health care resources to improve health outcomes and quality of life (OECD 2005).

The expenditure comparisons discussed in this chapter suggest that developed nations in which the direct governmental role in financing and managing health care is stronger may tend to be better positioned to manage the fiscal impact of population aging than those in which the direct governmental role is more limited. This is not to suggest that any of the

other OECD countries has identified the best way to organize and finance health care. Indeed, a certain level of dissatisfaction with the health care system in one's country appears to be almost a cross-national universal, and there is much international interest in the potential for market-oriented health care reforms including some of those that have been tried in the U.S. However, such efforts in other OECD countries have typically taken place within a much more strongly government-directed framework than is the case in the U.S. Overall, the oncoming demographic changes faced by the United States appear relatively modest in cross-national context, but their impact is likely to be severely exacerbated by the fragmented structure of the U.S. health care system.

References

- American Academy of Actuaries (2006a) Medicare Trustees' Report
- American Academy of Actuaries (2006b) Social Security Trustees' Report
- Anderson GF, Poullier JP (1999) Health spending, access, and outcomes: Trends in industrialized countries. *Health Aff* 18(3):178–192
- Anderson GF, Hurst J, Hussey PS, Jee-Hughes M (2000) Health spending and outcomes: Trends in OECD countries, 1960–1998. *Health Aff* 19(3):150–157
- Anderson GF, Hussey PS, Frogner BK, Waters HR (2005) Health spending in the United States and the rest of the industrialized world. *Health Aff* 24(4):903–914
- Anderson GF (1997) In search of value: An international comparison of cost, access, and outcomes. *Health Aff* 16(6):163–171
- Anderson GF, Reinhardt UE, Hussey PS, Petrosyan V (2003) It's the prices, stupid: Why the United States is so different from other countries. *Health Affairs* 22(3):89–105
- Anderson GF, Hussey PS (2000) Population aging: A comparison among industrialized countries. *Health Aff* 19(3):191–203
- Aversa J (2006) Bernanke: Baby boomers will strain U.S. The Washington Post, Oct 4. Retrieved April 9, 2007, <http://www.washingtonpost.com/wp-yn/content/article/2006/10/04/AR2006100401596.html>
- Bodenheimer T (2005a) High and rising health care costs. Part 1: Seeking an explanation. *Ann Intern Med* 142:847–854
- Bodenheimer T (2005b) High and rising health care costs. Part 2: Technologic innovation. *Ann Intern Med* 142:932–937
- Burtless G (2002) Does population aging represent a crisis for rich societies? Annual Meetings of the American Economic Association. Atlanta, GA
- Bush GW (2004) The state of the union. January 20, 2004, <http://www.whitehouse.gov/news/releases/2004/01/20040120-7.html>
- Callahan D (1987) *Setting limits: Medical goals in an aging society*. Georgetown University Press
- Carroll RJ, Horn SD, Soderfeldt B, James BC, Malmberg L (1995) International comparison of waiting times for selected cardiovascular procedures. *J Am College Cardiol* 25(3):557–563
- Congressional Budget Office (2007) The medicare advantage program: Enrollment trends and budgetary effects. Testimony by Peter S. Orszag, Director, before the Senate Committee on Finance, April 11
- Crystal S, Shea D (1990) Cumulative advantage, cumulative disadvantage, and inequality among elderly people. *The Gerontologist* 30(4)
- Crystal S (2007) Population aging and benefit sustainability: The impact of baby boomer aging on the health care system. In: Schaie W, Uhlenberg P (eds), *Social structures, demographic changes and the well-being of older persons. Societal Impact on Aging Series* Springer, Netherlands, pp 52–70
- Crystal S (2006) Economic well-being of the elderly. In: *Blackwell Encyclopedia of sociology*. Blackwell Publishing, Oxford and Boston, pp 3254–3257
- Davis K (1999) International health policy: Common problems, alternative strategies. *Health Aff* 18(3):135–143
- Davis K, Cooper BS (2003) American health care: Why so costly? Invited testimony before the senate appropriations committee, June 11
- Davis K, Schoen C, Doty M, Tenney K (2002) Medicare versus private insurance: Rhetoric and reality. *Health Affairs – Web Exclusive*: W311–W324
- Dirnfeld V (1996) The benefits of privatization. *Can Med Assoc J* 155(4):407–410
- Feldstein M (1999) Prefunding Medicare: Prospects for the long-term reform of Medicare. *Am Econ Rev* 89(2):222–227
- Feldstein M (1997) The case for privatization. *Foreign Aff* 76(4):24–36
- Feldstein M (2005) Rethinking social insurance. NBER Working Paper No. 11250
- Freedman VA (2005) Demographic reflections on the aging of the baby boom and its implications for health care. Penn State Social Structures Conference, Oct
- Freedman VA, Crimmins E, Schoeni RF, Spillman BC, Aykan H, Kramarow E, Land K, Lubitz J, Manton K, Martin LG, Shinberg D, Waidman T (2004) Resolving inconsistencies in trend in old-age disability: Report from a Technical Work Group. *Demography* 41(3):417–441
- Freedman VA, Martin LG, Schoeni RF (2002) Recent trends in disability and functioning among older adults in the United States. *J Am Med Assoc* 288(24):3137–3146
- Fuchs VR (2000) Medicare reform: The larger picture. *J Econ Perspect* 14(2):57–70
- Gokhale J, Smetters K (2003) Fiscal and generational imbalances: New budget measures for new budget priorities. Policy Discussion Papers, Federal Reserve Bank of Cleveland 5: Dec
- Gokhale J (2004) The future of retirement in the United States. Testimony submitted to United States Senate, Special Committee on Aging, Washington DC, Jan. 22
- Gokhale J (1998) Generational equity and sustainability in US fiscal policy. Federal Reserve Bank of Cleveland. April 15

- Gruber J, Wise D (2002) An international perspective on policies of aging societies. In: Altman SH, Shactman DI (eds) *Policies for an aging society*. John Hopkins University Press, Baltimore, (Table 2.3)
- Heffler S, Smith S, Keehan S, Borger C, Clemens MK, Truffer C (2005) U.S. health spending projections for 2004–2014. *Health Affairs – Web Exclusive*. W(5)74–W(5)85
- Hoover D, Crystal S, Kumar R, Sambamoorthi U, Cantor J (2002) Medical expenditures during the last year of life: Findings from the 1992–96 Medicare Current Beneficiary Survey. *Health Serv Res* 37(6):1625–1642
- Jacobzone S (2000) Coping with aging: International challenges. *Health Aff* 19(3):213–225
- Krugman P (2007) The plot against Medicare. *The New York Times*, April 20. Retrieved May 16, 2007, <http://select.nytimes.com/search/restricted/article?res=F40916F6345B0C738EDDAD0894DF404482>
- Krugman P (2005) A private obsession. *The New York Times*, Nov 18
- Lee R (2001) The fiscal impact of population aging. Testimony prepared for the Senate Budget Committee. Feb 5
- Lee R, Edwards R (2001) The fiscal impact of population aging in the U.S.: Assessing the uncertainties. NBER's Tax Policy and the Economy Meeting. Washington DC, Oct 2
- Lee R, Skinner J (1999) Will aging baby boomers bust the federal budget? *J Econ Perspect* 13(1):117–140
- Lubitz J, Beebe J, Baker C (1995) Longevity and medicare expenditures. *New Engl J Med* 332(15):999–1003
- Marmor T, Oberlander J (1998) Rethinking Medicare reform. *Health Aff* 17(1):52–68
- McWilliams JM, Meara E, Zaslavsky AM, Ayanian JZ (2007) Use of health services by previously uninsured Medicare beneficiaries. *New Engl J Med* 357:143–153
- Miller T (2001) Increasing longevity and Medicare expenditures. *Demography* 38(2):215–226
- Newhouse JP (1992) Medical care costs: How much welfare loss? *J Econ Perspect* 6(3):3–21
- Office of Management and Budget (2007) Budget of the United States of America, Fiscal Year 2008: Historical Tables: Table 1.2. Retrieved April 10, 2007, <http://www.whitehouse.gov/omb/budget/fy2008/pdf/hist.pdf>
- Organization for Economic Cooperation and Development (2006) *OECD health data 2006: Statistics and indicators for 30 countries*. Paris: OECD
- Organization for Economic Cooperation and Development (2005) *Health at a glance: OECD indicators 2005*. Paris: OECD
- Pauly M (2004) Means-testing in Medicare. *Health Affairs – Web Exclusive*: W(4)546–W(4)557
- Reinhardt UE, Hussey PS, Anderson GF (2002) Cross-national comparisons of health systems using OECD data, 1999. *Health Aff* 21(3):169–181
- Reinhardt UE (2003) Does the aging of the population really drive the demand for health care? *Health Aff* 22(6):27–39
- Reinhardt UE, Hussey PS, Anderson GF (2004) U.S. health care spending in an international context. *Health Aff* 23(3):10–25
- Singer BH, Manton KG (1998) The effects of health changes on projections of health service needs for the elderly population of the United States. *PNAS* 98:15618–15622
- Social Security Administration (2007) Summary of the 2007 Annual Social Security and Medicare Trust Fund Reports. Washington DC Retrieved April 29, 2007, <http://www.ssa.gov/OACT/TRSUM/tr07summary.pdf>
- Spillman BC (2004) Changes in elderly disability rates and the implications for health care utilization and cost. *Milbank Q* 82(1):157–194
- Sturm R (2002) The effects of obesity, smoking, and drinking on medical problems and costs. *Health Aff* 21(2):245–253
- Uhlenberg P (1992) Population aging and social policy. *Ann Rev Sociol* 18:449–474
- United States Census Bureau, Interim projections by age, sex, race and hispanic origin, 2004
- Walker DM (2004) Health care system crisis: Growing challenges point to need for fundamental reform. Comptroller General, General Accounting Office, April 16
- Wiener JM, Tilly J (2002) Population aging in the United States of America: Implications for public programmes. *Int J Epidemiol* 31:776–781
- Woolhandler S, Campbell T, Himmelstein D (2003) Costs of health care administration in the United States and Canada. *New Engl J Med* 349(8):768–775

Chapter 28

Health Care Expenditures

Edward C. Norton and Sally C. Stearns

Introduction

Changes in the size and composition of the older population will have profound effects on future health care expenditures in developed nations. With the baby boom cohorts joining the ranks of the elderly after 2010, the absolute amount of health care spending on elderly will increase greatly. The increasing expenditures raise concerns about the effectiveness of such spending and the ability of public insurance to provide high quality coverage.

By any measure, health care expenditures on the older population are large. In the United States, personal health care expenditures for persons over age 65 were \$437 billion in 2003 (MCBS Project 2006). Medicare covered approximately 55 per cent of these expenditures, with Medicaid, private and out-of-pocket payments covering 9, 13 and 19 per cent of expenditures, respectively. Annual growth in both aggregate and per capita personal health care spending for Medicare beneficiaries has also been high, with rates as high as 10 per cent per year in 1999–2001.

Much of the anticipated increase in health care spending will be directed toward those who are near the end of life, because expenditures generally increase as death approaches. Although aggregate spending (including spending near the end of life) will almost certainly increase, substantial debate exists about the extent to which spending *per capita* will increase. The effects of demographic trends at the individual

level are more subtle, so several different forces are relevant. Changes not only in mortality but also in morbidity, marital status, availability of informal care and disability rates all affect health care expenditures for elderly persons. Some of these trends have opposing effects on health care expenditures, so the net effect is uncertain.

Over the next several decades three important demographic trends will affect population aging in developed nations. First, the baby boom generation is approaching retirement and old age. As a result, the number of elderly will increase dramatically. Second, mortality rates have fallen. Mortality rates from all causes have fallen steadily over the last century and life expectancy increased from 48 in 1900 to 76.5 in 1990 (Cutler and Meara 2001). The mean life expectancy has been projected to increase from 76 in 1998 to 86 by the year 2070 (Lee and Tuljapurkar 1998). The higher life expectancy for both men and women will increase the absolute number of elderly. Third, the percentage of persons under age 20 is projected to change little between now and 2040. The relatively low and stable proportion of young persons implies that the support ratio – the number of working-age adults to children and elderly – will fall due to the increase in the proportion of elderly. The changes in the mortality and fertility rates, which started many years ago, will accentuate the future increase in the percentage of the population that is elderly. Therefore, both the number and proportion of elderly are expected to rise rapidly in all developed countries. In particular, the number and percentage of the oldest old, defined as age 85 and older, will increase rapidly.

Given the increase in the aged population, three more subtle demographic issues shape the debate about health care expenditures, because what matters is not only how long people live in old age but also how they live. Disability rates have fallen in the United

E. C. Norton (✉)
Department of Health Management and Policy
School of Public Health
University of Michigan
Ann Arbor, MI, USA
E-mail: ecnorton@umich.edu

States. Americans now live longer and live healthier. Furthermore, mortality rates for men are falling faster than for women. Therefore, women can expect fewer years of widowhood and more years of living with their spouse. This transition lowers demand for nursing home care. While a spouse often becomes an informal caregiver, adult children (especially daughters) have historically also been an important source of informal care; changing labor force participation rates may change these roles.

In addition to demographic trends, important non-demographic trends also drive health expenditures. These factors include technological change, the effectiveness of health care and attitudes of citizens towards who is responsible for caring for elderly. Newhouse has argued that the main driver of health care costs over the last several decades is changes in technology, not insurance or demographics (Newhouse 1992). Overall, new technology raises expenditures directly. Many new procedures or diagnostic equipment, such as cardiac surgery or MRIs, are more expensive than older procedures. New drugs also tend to be expensive, particularly in the United States. These innovations tend to raise expenditures in the short run. However, if new technology is effective at lowering morbidity and mortality, then changes in expenditures over a lifetime become ambiguous, although technology is generally believed to be cost increasing. Whether health expenditures increase or not over a lifetime depends in part on how long people live and at what level of disability.

Attitudes towards alternatives to formal health care also matter. In most societies, the extended family has traditionally cared for the elderly and many older people lived with an adult child. Over the last few decades in most developed nations, the government has taken on a larger role in financing and providing long-term care. Two examples illustrate the point. One is that Japan recently implemented national long-term care insurance. The primary motivation for providing this insurance was largely to relieve adult children – especially daughters – from the daily burden of caring for infirm elderly relatives. This change reflects a major shift in attitude towards who is responsible for providing long-term care. A second example is hospices, which provides palliative care for terminally-ill patients in what are usually lower cost settings. The hospice movement has tried to change attitudes of both patients and providers, especially in the United States.

Understanding the demography of health care expenditures is tremendously important for public policy. In most developed nations, a large fraction of health insurance is public. Therefore, future health expenditures affect financing and taxation. However, private decisions affect inputs to health (such as diet, exercise and smoking) and affect access to alternatives to formal health care (such as having a spouse and children who live nearby). It is this interplay between private decisions and public policy that make health expenditures for the elderly an important and complex policy issue.

The next section identifies additional issues relevant for understanding factors that will affect future trends in health care expenditures. Subsequent sections consider financing issues, evidence pertaining to the effects of age versus proximity to death in health care expenditures and other issues including the role of technological change. Although most health care expenditures made on behalf of elderly persons are not near the end of life, much of the focus of this chapter is on expenditures at the end of life because the changing demographic trends could cause substantial shifts in these expenditures. The chapter concludes with consideration of important areas for future research.

Issues for an Aging Population

As noted earlier, much of the debate about implications of the aging population for health care expenditures centers on the level of *per capita* expenditures, because it is virtually certain that expenditures in total will increase. For someone reaching retirement age (e.g., age 65), several factors affect health expenditures for the remainder of his or her life:

- Health status at retirement;
- Health status trajectory over the remaining life span;
- Use of health care services that affect health status or life expectancy; and
- Use of health care services that improve the quality of life;

Current social trends such as declining smoking rates and increasing obesity rates have substantial implications for health status at retirement and, subsequently, per capita health expenditures of future

cohorts in later life (Manton et al. 2006). For the cohorts expected to reach retirement in the next two decades, however, trends in expenditures may rely largely on current trends in healthy life expectancy. Measures of health expectancy, which combine mortality and morbidity into a single index (Bone et al. 1998), reflect the core issue of the competing theories of the expansion versus compression of morbidity (Fries 1980; Olshansky and Ault 1986). As people live longer, lifetime health expenditures will increase but the amount of increase will be determined by whether the onset of chronic disease and disability is being delayed at a rate greater than, less than, or equal to the changing age at death.

Evidence on changes in healthy life expectancy varies. Manton and Gu (2001) found decreases in the age-adjusted prevalence of chronic disability among elderly individuals in the United States using National Long-Term Care Survey data from 1982 through 1999, with the rate of decline increasing from 0.26 per cent per year in the 1980s to a decline of 0.56 per cent per year. A re-analysis of these data found, however, that most of the improvements were among people with less severe disability (Spillman 2004). Getting comparable estimates for countries other than the U.S. is complicated by the lack of longitudinal data and by varying definitions of disability in the available data sets. National household survey evidence from a number of developed countries suggests that the proportion of the extra years of life spent in disabled states rose between 1970 and 1990 but less time was spent in the most disabled states (Bone et al. 1995; Cambois and Robine 1996; Robine et al. 1997; OECD 1998, Bone et al. 1998; Bebbington and Comas-Herrera 2000, Bissett 2002). Therefore, unlike the U.S., in many developed countries healthy life expectancy may not be rising as quickly as life expectancy, although the proportion of time spent in the most disabled states (which are potentially the most health service use intensive) appears to be declining.

Even stable estimates of healthy life expectancy, however, may not result in accurate predictions of future costs of care, especially long-term care. A recent analysis found that among community-dwelling elderly, the growth in Medicare spending was greater for less-disabled persons than among the most disabled (Chernew et al. 2005). Varying cost trajectories by disability status can therefore offset any cost savings occurring due to declining disability rates.

The composition and value of health expenditures remain critical and largely unresolved issues for the aging population. Institutionalization rates in the U.S. have been declining over the past few years (Lackdiwalla and Philipson 2002), though the reasons for the decline remain speculative rather than definitive. Most likely, declining morbidity (e.g., increased healthy life expectancy) combined with expanded availability of residential options such as assisted living have enabled elders with distaste for institutionalization to find alternative and potentially less expensive sources of care. Demographic trends also have implications for health expenditures (Manton et al. 2006). While many projections exist for reduced availability of informal care from female children due to increased labor force participation by women, the fact that longevity is increasing faster for men than for women may mean that there is a likelihood that elderly females will have spouses to provide informal care and reduce use of nursing home or formal home care (Weaver et al. 2009).

While trends in health care expenditures raise critical issues from a budgeting and affordability perspective, an additional central issue pertains to the value of outcomes from health care spending. Use of measures such as Quality-Adjusted Life Years (QALYs), a measure of the quality and quantity of life lived, has been promoted as a way of enhancing appropriate decision making across different services or spending priority areas (Gold et al. 1996). Much debate exists, however, with respect to the validity of these assessments and comparisons, using QALYs are more relevant for decisions between acute care or pharmaceutical interventions than in assessing long-term care alternatives. Life in nursing homes may be agreed to be generally of lower quality than living in the community and many types of residential care and assisted living have been developed as ways of increasing options and facilitating “aging in place” in more home-like and less institutional settings. Inevitably, some proportion of persons with high levels of disability will require institutional care for the remainder of their life, although such spending may become increasingly concentrated in the last year or two of life if the theory of compression of morbidity holds. The quality and cost of that care becomes the relevant issues.

Assuming good measures of health expenditures and quality-adjusted years of life from such expenditures, the next question might be: Is the spending worth it? This question is tricky enough when it comes to choices

between alternative treatments. Some countries, such as the United Kingdom, have embraced the idea that a cut-off for the value of life must be used to begin to add rationality to choices between treatments and to assess the value of new cost-increasing technologies. While spending for aggressive life-extending treatments in the frail elderly might seem to be a target for cost-reductions, the fact that long-term care expenditures become an increasingly large component of total health expenditures with age means that determination of the value of spending becomes even more problematic.

Financing Issues

Public Insurance

In developed nations, elderly persons receive the bulk of their health insurance through public insurance. The reason for extensive public coverage is to combat adverse selection, in which private insurers only care to insure low-risk individuals. Because elderly persons spend a lot of money, on average, on health care and because it is often predictable who will spend the most, private markets alone fail to provide health insurance. One can hypothesize, however, that end-of-life expenditures have been a major contributor to the underlying problem of adverse selection.

In the United States, Medicare provides fairly complete insurance for inpatient care and partial coverage of outpatient care. There is limited insurance for skilled nursing home care. Recently Congress added insurance for prescription drugs, although the co-payments and deductibles can be substantial. The vast majority of elderly Americans supplement public insurance with either private insurance (Medigap) or Medicaid, which is means tested.

Most other countries also have some form of universal health insurance for all citizens. The details vary by country but public insurance covers much health care. Not all types of health care are covered equally, however. Acute care generally has better coverage than long-term care; hospital services have better coverage than chronic care services. This issue has enormous implications for future health care expenditures. The kinds of care that people demand or require change with age, as well as disability and marital status. As demographic

characteristics of the population change, so will the mix of care that is covered by public insurance.

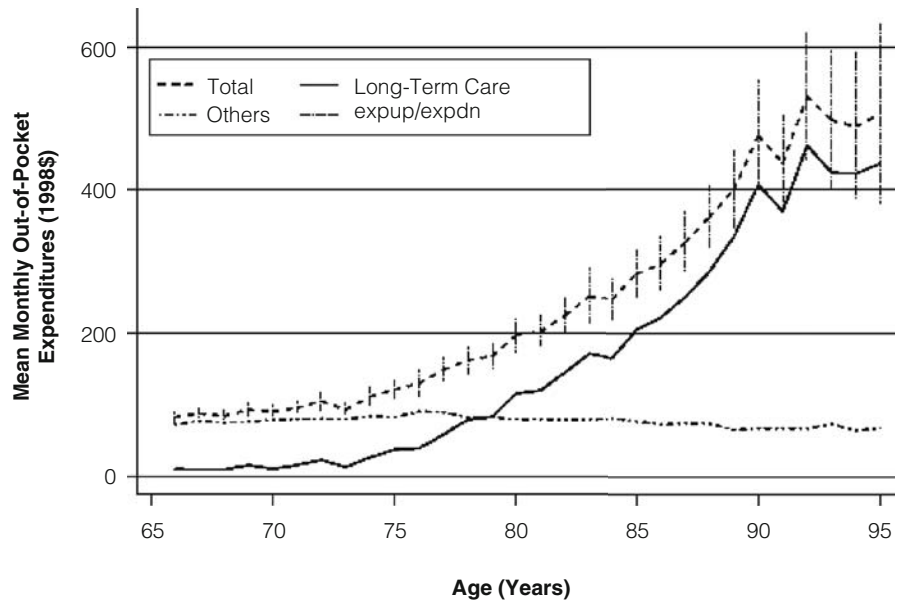
Out-of-Pocket Payments

The distinction between acute and long-term care expenditures is important for understanding out-of-pocket expenditure risk. In the U.S., out-of-pocket health care expenditures fall into two general categories, distinguished by type of care, provider and insurance. Acute illness tends to be treated by physicians in hospitals or clinics and covered by Medicare. The out-of-pocket portion of expenditures for acute illness is largely limited by Medicare, Medigap insurance, or Medicaid. Chronic illness and disability tend to be treated in nursing homes and covered primarily by out-of-pocket expenditures or Medicaid. Out-of-pocket expenditures on long-term care are not as well insured by public insurance as acute expenditures and so can add up unrelentingly (Norton 2000).

The pattern of out-of-pocket expenditure risk for long-term care is fundamentally different than all other categories combined. Medicare pays for relatively little nursing home care, with benefits falling after 20 days and constrained to 100 days per benefit period. Only a small percentage of elderly hold private long-term care insurance (Murtaugh et al. 1995; Cohen and Kumar 1997). Medicaid is the safety net for paying for nursing home care for most people. However, because Medicaid requires a deductible roughly equal to one's wealth less \$2,000 and a co-payment nearly equal to one's income, out-of-pocket expenditures for nursing home care can be high, even after becoming eligible for Medicaid. For example, for a typical middle-class elderly widow who enters a nursing home for a few years, out-of-pocket expenditures will likely exceed her income until her wealth is nearly depleted and she becomes eligible for Medicaid insurance. After this occurs, Medicaid will only pay the additional amount required over monthly income including the Social Security payment. Therefore, persons who use long-term care pay a lot out of pocket, even when covered by Medicaid.

Norton et al. (2006) showed two striking graphs about out-of-pocket health care expenditures paid by elderly Americans. The first graph shows that mean monthly out-of-pocket health care expenditures rise

Fig. 28.1 Out-of-pocket expenditures (means) by age and type



Source: Based on data from Norton, Wang, and Stearns (2006).

steadily as a function of age, based on data from the Medicare Current Beneficiary Survey 1992–1998 (see Fig. 28.1). Average out-of-pocket health care expenditures increase nearly six-fold during old age, from \$85 per month at age 66 to \$485 per month at age 95. This pattern represents a fundamental difference between long-term care expenditures and expenditures on all other services. The increase in total out-of-pocket health care expenditures is driven almost entirely by

long-term care. Other out-of-pocket expenditures – primarily inpatient care, physician services and pharmaceuticals – are essentially independent of age. So the young elderly face entirely different health care expenditure risk than older elderly in both magnitude and composition.

The second graph shows that the expenditure risk relative to income also increases with age (see Fig. 28.2). Furthermore, out-of-pocket health care expenditures

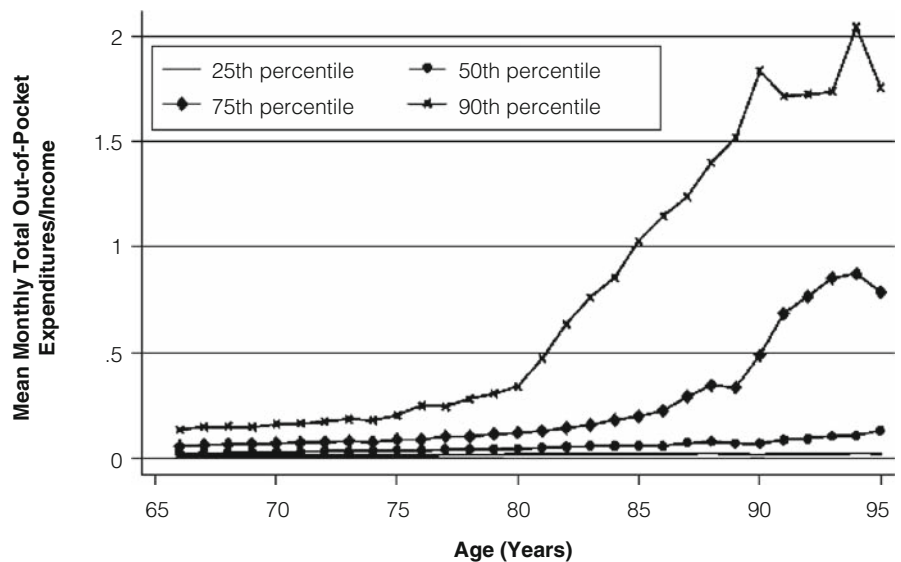


Fig. 28.2 Total out-of-pocket expenditures/income by age

Source: Based on data from Norton, Wang, and Stearns (2006).

are a substantial fraction of income for many elderly persons. By age 81, more than 10 per cent of elderly persons spend half of their income on health care. By age 90, more than 25 per cent do. When individuals face this level of financial risk, it is bound to affect personal finance decisions. Increases in longevity, if they have no other effect (such as on use of new medical technologies), will raise the risk of high long-term care expenditures during the final phase of life.

For elderly persons, out-of-pocket health care expenditures are important because health expenditures are the largest expenditure risk most elderly face. Consequently, out-of-pocket health care spending necessarily influences all other personal finance choices, as well as choices between certain types of health care services. Consumption, savings, bequests, inter-vivos transfers and decisions about formal versus informal care all depend on whether someone is likely to incur large health care bills. One reason that people do not follow the simple life-cycle model, which predicts that adults save during their working years and spend-down their wealth in retirement to die with no assets, is uncertainty about health care expenditures. It is this risk that drives many personal decisions.

Informal Care

Informal care, meaning unpaid care, is the most common form of long-term care. Informal care by definition generates no direct expenditures. However, informal care is important in any discussion of health care expenditures because informal can be either a substitute or a complement to formal care. Van Houtven and Norton (2004) laid out a conceptual model that explains how informal care can affect formal care. A sufficient condition for a substitute relationship is that the marginal benefit to health of medical care with respect to informal care be negative or zero. For example, a daughter who helps with errands, meals and cleaning may make home health care less effective, and therefore be a substitute. In contrast, a daughter who notices failing vision, schedules a cataract exam and provides transportation to the eye clinic is a complement to formal care.

Establishing whether or not informal care is a substitute or a complement has implications for future

health care expenditures, with potentially substantial implications for end-of-life expenditures. The empirical literature has produced mixed results. Providing evidence that they are complements, Langa and colleagues (2001) found that the increased paid home care in the 1990s went to people with greater social support and that paid home care shifted toward elderly living with their children. Similarly, Liu, Manton and Aragon (2000) found that the combined use of informal and formal care increased among disabled elderly between 1984 and 1994. In contrast, Spillman and Pezzin (2000) found over the same time period that while the total number of active family caregivers declined, a constant number of primary caregivers cared for more severely disabled family members and that there was a growing pattern of reliance on formal care in general. This result suggests that while informal care and formal care may be substitutes in general, they are complements among the severely disabled. Even evidence within the same large study is at odds. As a part of the Channeling Experiment Kemper (1992) found that the availability of immediate family members increased the reliance on informal care and reduced the reliance on formal care, while Christianson (1988) found that the increase in publicly-funded home care did not substantially reduce the amount of informal care received. Finally, Weaver and colleagues (2009) showed that greater availability of spousal informal support was associated with a significant decrease in the likelihood of nursing home placement at the end of life.

The lack of a consistent finding is explained by the complex nature of informal care and formal care. The two types of care can occur simultaneously or can precede or follow each other. Consider a parent with Alzheimer's recovering from a broken hip. A parent may have a caregiver to help with IADLs and then after the hip break (and subsequent hospital care) may have a paid physical therapist in the home. Or, a hip break may spur contact with a paid home health aide for help with ADLs, which in turn makes clear the need for an informal caregiver to start helping with ADL and IADL tasks. Even when the two types of care occur simultaneously, informal care may be a substitute for ADL care but a complement for higher skilled tasks such as physical therapy. Although families are increasingly being asked to provide highly skilled medical care, beyond a certain point in a parent's need for care, such as becoming bed ridden or having advanced Alzheim-

er's, a single caregiver may not be able or willing to provide care, suggesting that informal and formal care are not substitutes in some cases. This example points out the importance of using statistical methods to deal with the endogeneity inherent in formal and informal care and of examining many types of formal care that informal care might affect.

Most observational studies directly linking informal and formal care do not account for endogeneity (Wolinsky et al. 1986; Garber 1989; Bass and Noelker 1987; Soldo 1985). The few studies that control for endogeneity in models of informal care and formal care suggest that informal care and formal care are substitutes (Lo Sasso and Johnson 2002; Pezzin et al. 1996; Greene 1983). Pezzin et al. (1996) used lagged formal care to predict informal care. Lo Sasso and Johnson (2002) used a nationally representative sample of the elderly and bivariate probit methods to control for endogeneity bias between informal care and nursing home utilization. They found that, among elderly with physical problems, frequent help from an adult child with basic personal care reduced the likelihood of nursing home care by about 70 per cent over a two-year period. Regarding home care services, Greene (1983) also considered the reverse causation inherent in formal and informal care and used three-stage least squares to control for endogeneity bias. He found that people with informal care received fewer formal home health care and social services. Because the sample is limited to the disabled elderly in one state, it is not easy to generalize Greene's findings to the United States.

In more recent research, Van Houtven and Norton (2004) found that informal care by children is a net substitute not only for long-term care such as home health care and nursing home care but also for hospital care and physician visits. A 10 per cent increase in informal care leads to a 0.87 percentage point decline in the probability of any home health care use (mean of 8.3 per cent) and a two-night reduction in nursing home use (mean of 25 nights per year) among the single elderly. These results are statistically significant. Informal care is a complement to outpatient surgery. Examining the likelihood of home health care use, nursing home use and outpatient surgery collectively indicates that informal care is a net substitute for these three types of formal care. Their work controls for the endogeneity of informal care. Other researchers, using AHEAD data and instrumental variables estimation

to control for endogeneity of informal care, echo the finding that informal care is a net substitute for nursing home care (Van Houtven and Norton 2008; Charles and Sevak 2005; Lo Sasso and Johnson 2002).

End-of-Life Expenditures and the "Red Herring" Argument

Health care expenditures at the end of life are high. Lubitz and Riley (1993) estimated that 30 per cent of Medicare spending goes towards persons in their last year of life. Yang et al. (2003) showed that total health care expenditures increase gradually from three years before death to one year before death, then increase much more rapidly during the last year of life. The increase is especially pronounced in the last eight months, going from about \$2,000 per month to more than \$5,000 per month (in 1998\$). In England, health care expenditures were found to increase from about an average of £500 per quarter at one year before death to £1,700 in the quarter before death (in 1998–1999£, Seshamani and Gray 2004). Similar large increases in health care expenditures with approaching mortality have been found in Switzerland (Felder et al. 2000) and Canada (McGrail et al. 2000)

Lubitz et al. (1995) analyzed 17 years of Medicare claims data to estimate lifetime Medicare payments as a function of age and time until death. They found that expenditures rise rapidly in the three years prior to death but less so for older persons. Lifetime Medicare expenditures rise with age but at a diminishing rate. Yang et al. (2003) investigated the relative contributions of both age and time to death to health care expenditures for elderly Medicare beneficiaries. Monthly health care expenditures for elderly people increase substantially with age primarily because mortality rates increase with age and health care expenditures increase with closeness to death. Time to death is the main reason for higher inpatient care expenditures, while aging is the main reason for higher long-term care expenditures. Both increases in the absolute number of the elderly and their longevity will increase future Medicare expenditures. Yet the expected increase in per person health care expenditures due to greater longevity of Medicare beneficiaries will be less than expected because of the concentration of

expenditures at the end of life rather than during extra years of relatively healthy life.

While disability trends are undoubtedly the driving force in long-term care expenditures, a more subtle concern pertains to the competing roles of age and increasing longevity. Starting with studies in the 1980s, much work has shown that in a given year Medicare beneficiaries who are dying account for a hugely disproportionate amount of total Medicare expenditures (Lubitz et al. 1995). Furthermore, this relationship has remained relatively constant over time, thereby providing evidence consistent with compression of morbidity. While some have argued that expenditures at the end of life may follow a fairly rational pattern in that heroic expenditures at the end of life decline substantially with age, dying is often simply a fairly costly process that may involve substantial total health expenditures (with acute care expenditures accounting for a greater proportion at younger ages and long-term care expenditures accounting for a relatively greater proportion at older ages).

Substantial literature documents that proximity to death – rather than age per se – plays a pivotal role in acute health care expenditure predictions. Zweifel et al. (1999) coined the term “red herring” for this argument in reference to the fact that population aging is generally viewed as the issue of key concern for future health care expenditures for the elderly – a focus that precludes appropriate attention to the real causes of expenditure growth. Estimations by a range of authors and for a variety of developed countries (Switzerland, the United Kingdom and the United States) have shown that the effect of age in explaining acute care expenditures is substantially reduced or virtually eliminated once time-to-death is controlled (Zweifel et al. 1999; Spillman and Lubitz 2000; Yang et al. 2003; Stearns and Norton 2004; Seshamani and Gray 2004).

A smaller body of evidence shows that disease status (Seshamani and Gray 2004) or functional ability (Cutler and Meara 2001) may modify the relationship between age, proximity to death and health expenditures. In particular, Cutler and Meara showed that the effects of disability and time to death on acute care health expenditures explain most of the age effect and are largely independent.

While acute care expenditures account for a substantial portion of total health expenditures by the elderly, aging populations use many other types of

health services and the proportion of health expenditures accounted for by these other services increases with age (Yang et al. 2003). Only a limited literature has looked at long-term care expenditures in relation to proximity to death (Spillman and Lubitz 2000; Spillman and Lubitz 2002; McGrail et al. 2000). Werblow and colleagues investigated this issue for a range of services and showed that a “school of red herrings” exists in that for most services including long-term care, health care expenditures are driven largely by time to death rather than age (Werblow et al. 2007). Spillman and Lubitz (2000) showed that expenditures for long-term care increase at an increasing rate with age, in contrast with acute care expenditures that increase at a declining rate with age. Although Spillman and Lubitz (2002) showed that declines in disability between 1986 and 1993 did not substantially reduce nursing home use, this work did not explicitly control for proximity to death. Other work has shown that the implications of aging and increasing longevity for long-term care expenditures are modest relative to the effects of future increases or decreases in functional abilities of the elderly (Stearns et al. 2007).

Lakdawalla and Philipson (2002) postulated a model in which increases in life expectancy increase time in the healthy state only. This scenario is consistent with evidence that the period of disability and chronic morbidity for the elderly will become more compressed, resulting in more healthy years of life (Manton et al. 1993; Manton and Gu 2001). While other researchers have also found evidence of declines in the need for help with daily activities, some of the decline in measured disability may be due to the increased use of assistive equipment, as opposed to a change in the underlying health status (Freedman et al. 2004).

Other Issues Affecting Future Health Care Expenditures

Demographics: Changes in Mortality

Lakdawalla and Philipson (2002) argue that increased life expectancy may actually reduce long-term care expenditures. Their argument hinges on two consid-

erations. First, people who live longer may spend more time in good health than poor health. They assume that demand for long-term care depends on the number of persons in poor health, while the supply of informal caregivers depends on the number in good health, in a model with only two health states. If people live longer and spend a higher fraction of time in good health, then the supply of informal care increases faster than the demand for long-term care. Long-term care is labor intensive, so its cost depends primarily on the supply of labor, hence the number of healthy persons. The price is inversely related to the support ratio, defined as the ratio of number of persons in good health to the number of persons in poor health. In addition, the change in total expenditures depends on how demand responds to price. If demand is price elastic, then a change in longevity will have a smaller effect on total expenditures than that predicted solely by the change in demand because of price effects. These price effects may also affect public expenditures differently than private expenditures. If the government offers a means-tested insurance program for long-term care, such as Medicaid in the United States, then a price increase raises a person's desire to spend-down and public expenditures will increase.

Second, Lakdawalla and Philipson (2002) showed that marital status is important because a spouse is a close substitute for formal long-term care. If a frail person goes to a nursing home only if they are single but not if married, then aggregate long-term care expenditures will depend on the differential frailty and mortality rates of men and women. They argue that demand for formal long-term care grew more slowly during the last 20 years when male mortality rates decreased faster than female rates. When men live longer they decrease the demand for formal long-term care from women, who are not widows as long.

The implication of their work is that future long-term care expenditures depend on frailty. The period of disability and chronic morbidity for the elderly has become more compressed, resulting in more healthy years of life (Manton 1993). Laditka (1998) concluded that these observed changes in life expectancy and morbidity would not change the fraction of time spent in a nursing home, compared to the community would remain unchanged.

Technological Change and Diffusion

The global diffusion of technology has implications for health care costs in all countries. The tendency of elderly persons to use certain technologies has historically been constrained informally by assessment of likely benefit from aggressive treatment and more formally by explicit guidelines for reimbursement (e.g., Medicare generally does not pay for more than one transurethral resection of the prostate per beneficiary). Historically, the rate of growth in medical spending has exceeded income growth by about 2.5 per cent since 1929, although the difference was lower in the 1990s (Cutler and Sheiner 1998). As the elderly live longer and remain healthier, such implicit and explicit constraints will change. For example, over the past decade Congress has legislated Medicare reimbursement for specific preventive health technologies, including immunizations, mammography and flexible sigmoidoscopies, which will undoubtedly enhance technology diffusion. In other cases, where clinical data are not available for older adults, diffusion may occur more slowly or with much greater geographic variability.

Fuchs (1999) provided a useful descriptive picture of the rate of diffusion of three health technologies among the elderly population in the United States and explored ways to pay for the anticipated additional diffusion likely to occur in the future. Fuchs showed that use of cardiac catheterization, angioplasty (PTCA) and coronary artery bypass graft (CABG) increased markedly between 1987 and 1995 for both genders for persons above 65 years of age. The average annual rate of increase during this time period for persons age 85 and older was roughly 16 per cent for cardiac catheterization, 21 per cent for PTCA and 13 per cent for CABG. These high rates of diffusion were due in part to initial low rates of use by individuals age 85 and older in 1985 but still these rates represent a striking level of diffusion of expensive technology to people of considerable age.

Calculations using data from the Hospital Cost and Utilization Project (www.hcupnet.ahrq.gov) and population estimates (www.census.gov) show somewhat different patterns for the subsequent time period. From 1997 to 2005, the average annual rate of increase in cardiac catheterization and PTCA averaged 7 and 12 per cent respectively per year for persons aged 85

and older, representing continuing diffusion of these technologies. In contrast, from 1997 to 2005, the rate of CABG actually decreased an average of 5 per cent per year among persons age 85 and older. The decline in CABG reflects a broader substitution of PTCA for CABG for all age groups. So while use of some procedures may both wax and wane among the elderly, reflecting broader patterns of medical treatment, the general tendency for diffusion of popular technologies into the elderly population continues.

Diffusion of some technologies, such as the continuously expanding use of PTCA for elderly individuals, not only increases life expectancy among the elderly but also serves to transform the care of the surviving elderly from acute care for heart disease to chronic care, such as lifelong pharmacological treatment. The likelihood of older individuals receiving a particular treatment should be affected not only by the relative and absolute likelihood of improvement from treatment, however but should also be determined by considerations of risk reduction given age-specific all cause mortality and corresponding expected longevity (Welch et al. 1996). These considerations apply not only to treatments that may affect an individual's life expectancy (e.g., heart surgery) but also treatments that will more likely have greater impact on quality of life than on length of life (e.g., hip replacement).

Technology diffusion to the elderly is widespread in other countries. Dozet et al. (2002) hypothesized that technologies are often first applied in younger age groups but ultimately diffuse to older age groups. Their analysis of Swedish data from 1991 to 1994 shows striking expansion of the use of percutaneous transluminal coronary angioplasty (PTCA) by age, as well as similar evidence from 1988 to 1994 for coronary artery bypass graft (CABG).

Expenditures at the end of life are closely linked to technology. Scitovsky (1988) used data from patients at the Palo Alto Medical Clinic to explore whether people with poorer functional status are likely to receive fewer hospital services during the last year of life. Scitovsky found high levels of long-term care expenditures relative to acute care expenditures for the frail elderly and functionally impaired. Scitovsky concluded that sophisticated life-extending hospital services may already be allocated in a more rational manner than might generally be assumed. Her results were consistent with a situation in which age and functional status are taken into account, implying that implicit rationing

may be occurring and that concerns about excessive use of hospital services by persons with poor prognoses may be unfounded.

Consistent with Scitovsky's speculations, Lubitz (1995) showed that Medicare expenditures during the last two years of life decline with age. The Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatment (SUPPORT) did not show any improvement in accord between patient and physician preferences regarding resuscitation or reduction in intensive care unit or ventilator use after a specific intervention, with no clear reason for the lack of impact (Lynn et al. 2000). Alignment of patient preferences with physician preferences regarding end of life care requires good communication. Some researchers speculated that communication of preferences for severely ill patients is more efficient than is often presumed (Parrillo 1996) but other researchers still find evidence of use of expensive treatments with little benefit (Hamel et al. 1997). Levinsky and colleagues (2001) assessed whether the decrease in last year of life expenditures by age was associated with decreasing aggressiveness in medical care. Using data from Massachusetts and California, they found that the aggressiveness in treatment by age during the last year of life did decrease, as marked by reduced likelihood of use of intensive care, cardiac catheterization, dialysis, ventilators and pulmonary artery monitors.

Hospitals, where access to new technology is high, obviously play a central role in health care expenditures in the last year of life. Information from death certificates indicates that in 1998, overall 41 per cent of persons aged 65 or older were hospital inpatients when they died; persons age 85 or older are substantially less likely to die in a hospital than persons aged 65–84 (34 vs. 45 per cent, respectively) (Flory et al. 2004). Using data on a sample of decedents from the Longitudinal Study of Aging, Stearns and colleagues (1996) showed that almost three-quarters of the Medicare beneficiaries age 70 and older who died were hospitalized during that year and over half had a non-terminal hospitalization.

A great deal of the concern about future health care costs for the elderly is based on the empirical finding that per capita health expenditures are higher for older persons than younger persons. Cross-sectional analysis shows that older persons spend more on health care. Per-capita health expenditures are higher for 85-year olds than 65-year olds in part because mortality

increases with age and health expenditures are highest near the end of life (Fuchs 1990). An increase in the number of elderly, so the argument goes, should raise costs. A careful review of the evidence suggests a different conclusion. Newhouse (1992) calculated that the changing proportion of age groups was responsible for only about a 15 per cent rise in real medical expenditures per capita from 1950 through 1987, whereas real expenditures increased by more than a factor of 5. Newhouse concluded that the majority of the increase in elderly health expenditures over time is due to technological change.

Just as the aging of the population is a worldwide phenomenon in industrialized countries, as discussed above, so is the diffusion of health technologies. McClellan and Kessler (1999) reported on evidence of global diffusion of technology to treat heart attacks from 16 countries. Their framework shows that economic and regulatory provisions can affect the rate of diffusion, yet diffusion is inevitable.

The diffusion of technology into elderly cohorts has not been static in the past and is likely to increase in the future, particularly with increases in longevity and any increases in healthy life expectancy. The MCBS, through its unique characteristics, will allow tracking of technology use over time. Determining whether the inferences found in previous work are stable over time is the critical next step.

Informal Care and Substitutes for Formal Care

Over the next few decades, the relationship between informal care and formal care is likely to change. In general, demand for informal care is expected to increase and supply is expected to decrease (Van Houtven and Norton 2004). Demand for informal care will grow as baby boomers age. The last of the baby boomers turns 65 in 2030, at which time the number of people in the United States over the age of 65 will be nearly double what it is today. One countervailing trend is that the life expectancy for men has increased faster than for women. Elderly persons remain married longer at older ages (Lakdawalla and Philipson 2002). This reduces demand for long-term care because a spouse typically provides informal care.

Meanwhile, the supply of informal caregivers may shrink. More women are joining the labor force.

Migration, delayed childbearing, smaller families and dissolved marriages mean that many children have limited contact with elderly parents (Pezzin and Schone 1999; Kotlikoff 1989). Thus far, however, changes in family size and work behavior of daughters have not explained the move toward paid long-term care (Stern 1995). Although informal care has traditionally been provided by daughters who are out of the labor force, more sons and full-time workers are providing informal care (Carmichael and Charles 2003; Spector et al. 2000; Spillman and Pezzin 2000).

Despite this, trends in the United States point toward having more formal care arrangements, which is more costly than informal care (Norton 2000). Medicare and Medicaid have expanded insurance coverage of long-term care over the last fifteen years, thereby increasing demand for paid care (CBO 1999). Combined, these factors show that the market for informal care and its relationship to formal care will change over time.

Hospice Care and End-of-Life Expenditures

In a classic and frequently cited article, Emanuel and Emanuel (1994) questioned whether interventions targeting end-of-life expenditures (e.g., advance directives, hospice care and less aggressive care) can really save costs. Based on available data, the Emanuels estimate that the expenditures likely to be saved by these types of interventions are minimal:

It may be difficult to reduce substantially the percentage of health care expenditures spent on patients who die because humane care at the end of life is labor-intensive and therefore expensive. Even when patients refuse life-sustaining interventions, they do not necessarily require less medical care, just a different kind of care. High-quality palliative care – providing pain medications, helping in the activities of daily living, using radiation therapy for pain relief, and so on – requires skilled, and costly, personnel. Thus, even low-technology health care that is administered outside hospitals to terminally ill patients is not cheap.

The Emanuels did however identify several studies indicating that hospice care may result in modest cost savings if the decision to stop treatment is pushed back several weeks (Kidder 1992; Spector and Mor 1984; Mor and Kidder 1985; Greer and Mor 1986).

Studies from other countries have shown mixed evidence on the potential for real cost reductions from hospice care. A Canadian study showed that hospice care was cost neutral because increased costs from palliative care programs were offset by reductions of time in hospital (Fassbender et al. 2005). A study in Taiwan that tried to correct for self-selection into hospice using an instrumental variable approach showed that hospice costs were lower than conventional care costs (Lo 2002). This study raises the issue of whether estimates of potential savings from alternatives such as hospice have been underestimated due to methodological issues, as well as the broader issue that aspects of the benefit package itself limit the ability of hospice care to ensure rational use of health services at the end of life (Miller and Mike 1995).

Directions for Future Research

The current state of knowledge about end of life expenditures, as laid out in this chapter, leads to the question of the most fruitful areas for future research. Four areas that seem particularly important or promising include: (1) expanding the scope from health care expenditures to include behavioral expenditures related to health status; (2) empirical challenges related to distinguishing the degree of causality between health expenditures and increased longevity; (3) evaluation of emerging policy options (especially those related to end-of-life expenditures); and (4) exploration of trends in health expenditures and end-of-life expenditures in rapidly developing countries.

The first area for future research is expanding the scope of expenditures from health care expenditures – formal health care such as inpatient care, outpatient care and prescription drugs – to include all health expenditures. Expenditures on health behaviors, such as expenditures on exercise, diet, smoking, drinking and illegal drugs, might all be added. This more encompassing view originates in Grossman's (1972) model of health capital. Over time, people invest in their health capital. Investments include but are not limited to, formal health care expenditures. Other health inputs such as smoking and drinking affect a person's health but are not counted in health care expenditures.

One could imagine two general types of responses to a non-fatal health shock. A person who suffers a heart attack may decide to change a number of habits to improve his cardiovascular system and try to prevent further heart attacks. He might get daily exercise, improve his diet, stop smoking and increase the frequency of health checkups. All of these behaviors would be important investments in health. All could delay the time of death and may alter the future stream of health care expenditures. Another response could be fatalistic. A person who is told she has terminal cancer may decide not to invest further in health but to enjoy the pleasures of life. Any detrimental health effects would be swamped by the overriding problem of cancer.

The second promising area for future research on end-of-life expenditures pertains to untangling the endogenous effects of mortality and health care expenditures. If health care has any therapeutic effect, then additional health care expenditures should achieve desirable health outcomes, such as delaying death, improving function, or reducing pain or suffering. (If this is not true, then additional health care expenditures have no value.) Some people will die earlier if they receive less health care. The time of death depends in part on past health care expenditures. The underlying source of endogeneity is unobserved (omitted) variables that are correlated with both time to death and health care expenditures. Health status is always incompletely measured. Therefore, simple models that predict expenditures as a function of time until death estimate biased coefficients. The predicted bias is downward; the estimated effect is even more negative than the true coefficient. Simple models over-estimate (in absolute value) the effect of time to death on health care expenditures. Estimating the true causal effect of time until death is a statistical challenge.

The common econometric methods to deal with endogeneity are not likely to work. One approach is instrumental variables, in which at least one variable that predicts time to death – but not health expenditures – must be found to identify the model. It is hard to think of variables that affect time to death that are unrelated to health care expenditures. The other common method is person fixed effects to control for time-invariant unmeasured person level effects. Although this may control for certain unmeasured factors, it does not solve the econometric problem. Fixed effects

only control for time-invariant factors. When death approaches health status is clearly changing.

Time to death may be predicted more accurately for certain subpopulations, for example by using information about staging in patients with advanced cancer. However, even then there would be important health status information that is known to the clinicians that is unknown to the researchers, still allowing bias.

The third promising area for future research pertains to the evaluation of emerging innovations that may be able to reduce costs, improve quality, or conceivably do both. While Medicare expenditures for end-of-life care have been remarkably stable as a proportion of health expenditures for elderly cohorts, new policies could conceivably reduce end-of-life expenditures. For example, although the Medicare hospice benefit has generally been used by people very close to death and has not been shown definitively to reduce end-of-life expenditures, part of the problem may be the restrictiveness of the benefit in that people must be declared to have less than six months to live and must be willing to forego aggressive life-saving treatments. Alternative approaches, such as allowing people access to supportive hospice services while still pursuing some aggressive approaches may facilitate an earlier transition to and acceptance of palliative care in lieu of futile expenditures. As another example, 20 years ago Daniel Callahan, in his book *Setting Limits: Medical Goals in an Aging Society*, proposed that Medicare could give people a choice between an aggressive package of services focused on curative or life-extending treatments versus a package with a greater array of supported services intended to maximize function and quality of life but not extend life. In theory, the configuration of benefits could be set to have equal cost, or equal cost per quality-adjusted life year.

A fourth area for future research is to study this topic in rapidly developing countries. While there has been much research in developed nations, especially the United States and European nations, the results may not extend to developing nations due to differences in demographics and health care systems. Countries such as India and China are undergoing vast economic transformations while anticipating substantial demographic transitions. The sheer size of these countries means that investigating and applying (when relevant) insights pertaining to health care expenditures and end-of-life expenditures already gleaned from other

developed countries may help to ease the future burden of end-of-life expenditures for aging population cohorts.

Acknowledgement Edward C. Norton was supported in part by funding from an NIA Center Grant (P30 AG04001).

References

- Bass DM, Noelker LS (1987) The influence of family caregivers on elder's use of in-home services: An expanded conceptual framework. *J Health Soc Behav* 28:84–196
- Bebbington A, Comas-Herrera A (2000) Healthy life expectancy: Trends to 1998, and the implications for long term care costs: PSSRU discussion paper 1695
- Bissett B (2002) Healthy life expectancy in England at subnational level. *Health Stat Q* 14:21–29
- Bone M, Bebbington A, Jagger C, Morgan K, Nicolaas G (1995) Health expectancy and its uses. London: HMSO
- Bone M, Bebbington A, Nicolaas G (1998) Policy applications of health expectancy. *J Aging Health* 10(2):136–153
- Cambois E, Robine J (1996) An international comparison of trends in disability free life expectancy. In R. S. Eisen, F (ed.), *Long-term Care: Economic Issues and Policy Solutions*. Kluwer: Dordrecht
- Carmichael F, Charles S (2003) The opportunity costs of informal care: Does gender matter? *J Health Econ* 22(5):781–803
- CBO (1999) Projections of services for long-term care services for the elderly. Washington, DC: Congressional Budget Office
- Charles KK, Sevak P (2005) Can family caregiving substitute for nursing home care? *J Health Econ* 24(6):1174–1190
- Chernew ME, Goldman DP, Pan F, Shang B (2005) Disability and health care spending among medicare beneficiaries. *Health Affairs (Millwood)* 24(Suppl2):W5R42–52
- Christianson, JB (1988) The effect of channeling on informal caregiving. *Health Serv Res* 23(1):99–117
- Cohen MA, Kumar AKN (1997) The changing face of long-term care insurance in 1994: Profiles and innovations in a dynamic market. *Inquiry* 34:50–61
- Cutler DM, Meara E (2001) The concentration of medical spending: An Update. In: Wise DA (ed.), *Themes in the economics of aging*. Cambridge, Massachusetts: The University of Chicago Press, National Bureau of Economic Research
- Cutler DM, Sheiner L (1998) Demographic and medical care spending: standard and non-standard effects, National Bureau of Economic Research Working Paper Series, Working Paper 6866
- Dozet A, Lyttkens CH, Nystedt P (2002) Health care for the elderly: Two cases of technological diffusion. *Soc Sci Med* 54:49–65
- Emanuel EJ, Emanuel LL (1994) The economics of dying – The illusion of cost savings at the end of life. *New Eng J Med* 330(8):540–544
- Fassbender K, Fainsinger R, Brenneis C, Brown P, Braun T, Jacobs P (2005) Utilization and costs of the introduction of system-wide palliative care in Alberta 1993–2000. *Palliat Med* 19(7):513–520

- Felder S, Meier M, Schmitt, H (2000) Health care expenditure in the last months of life. *J Health Econ* 19(5):679–695
- Flory J, Young-Xu Y, Gurol P, Levinsky N, Ash A, Emanuel E (2004) Place of death: US trends since 1980. *Health Affairs* 23(3):194–200
- Freedman VA, Crimmins E, Schoeni RF, Spillman BC, Aykan H, Kramarow E, Land K, Lubitz J, Manton K, Martin LG, Shinberg D, Waidmann T (2004) Resolving inconsistencies in trends in old-age disability: Report from a technical working group. *Demography* 41(3):417–441
- Fries JF (1980) Aging, natural death, and the compression of morbidity. *New Eng J Med* 303(3):130–135
- Fuchs VR (1990) The health sectors share of the gross national product. *Sci* 247 (4942):534–538
- Fuchs VR (1999) Health care for the elderly: How much? Who will pay for it? *Health Affairs* 18(1):11–21
- Garber A (1989) Long-term care, wealth, and health of the disabled elderly living in the community. In: Wise, DA (ed.), *Econ Aging*, University of Chicago Press, Chicago, pp 255–277
- Gold MR, Siegel JE, Russell LB, Weinstein MC (1996) *Cost-effectiveness in health and medicine*. Oxford University Press, New York
- Greene VL (1983) Substitution between formally and informally provided care for the impaired elderly in the community. *Medical Care* 21(6):609–619
- Greer DS, Mor V (1986) An overview of National Hospice Study findings *J Chron Dis* 39(1):5–7
- Grossman M (1972) On the concept of health capital and the demand for health. *J Political Econ* 80(2):223–255
- Hamel MB, Phillips RS, Davis RB, et al. for the SUPPORT Investigators (1997) Outcomes and cost-effectiveness of initiating dialysis and continuing aggressive care in seriously ill hospitalized adults. *Ann Intern Med* 127:195–202
- Kemper P (1992) The use of formal and informal home care by the disabled elderly. *Health Serv Res* 27(4):421–451
- Kidder D (1992) The effects of hospice coverage on Medicare expenditures. *Health Serv Res* 27(2):195–217
- Kotlikoff L (1989) How much care do the aged receive from their children? A bimodal picture of contact and assistance. The University of Chicago Press, Chicago
- Laditka SB (1998) Modeling lifetime nursing home use under assumptions of better health. *J Gerontol: Soc Sci* 53B(4): S177–S187
- Lakdawalla D, Philipson T (2002) The rise in old age longevity and the market for long-term care. *Am Econ Rev* 92:295–306
- Langa KM, Chernew ME, Kabeto MU, Katz SJ (2001) The explosion in paid home care in the 1990s: Who received the additional services? *Med Care* 39(2):147–157
- Lee R, Tuljapurkar, S (1998) Uncertain Demographic Futures and Social Security Finance. *Am Econ Rev* 88:237–241
- Levinsky NG, Yu W, Ash A, Moskowitz M, Gazelle G, Saynina O, Emanuel E (2001) Influences of age on Medicare expenditures and medical care in the last year of life. *J Am Med Assoc* 286:1349–1355
- Liu K, Manton KG, Aragon C (2000) Changes in home care use by disabled elderly persons: 1982–1994. *J Gerontol B: Psychol Sci Soc Sci* 55 (4):S245–253
- Lo JC (2002) The impact of hospices on health care expenditures – the case of Taiwan. *Soc Sci Med* 54(6):981–991
- Lo Sasso AT, Johnson RW (2002) Does informal care from adult children reduce nursing home admissions for the elderly? *Inquiry* 39(3):279–297
- Lubitz J, Beebe J, Baker C (1995) Longevity and Medicare expenditures. *New Eng J Med* 332(15):999–1003
- Lubitz J, Riley G (1993) Trends in Medicare payments in the last year of life. *New Eng J Med* 328:1092–1096
- Lynn J, DeVries KO, Arkes HR, Stevens M, Cohn F, Murphy P, Covinsky KE, Hamel MB, Dawson NV, Tsevat J (2000) Ineffectiveness of the SUPPORT intervention: Review of explanations. *J Am Geriatr Soc* 48:S206–S213
- Manton KG, Gu X (2001) Changes in the prevalence of chronic disability in the United States black and non-black population above age 65 from 1982 to 1999. *Proceedings of the National Academy of Science USA* 98(11):6354–6359
- Manton KG, Gu X, Lamb VL (2006) Long-term trends in life expectancy and active life expectancy in the United States. *Popul Dev Rev* 32(1):81–105
- Manton KG, Stallard E, Liu K (1993) Forecasts of active life expectancy: Policy and fiscal implications. *J Gerontol* 48(Special Issue):11–26
- MCBS Project (2006) *Health & health care of the medicare population: Data from the 2003 medicare current beneficiary survey*. Rockville, MD: Westat
- McClellan M, Kessler D (1999) Global analysis of technological change in health care: the case of heart attacks. *Health Affairs* 18(3):250–255
- McGrail K, Green B, Barer ML, Evans RG, Hertzman C, Normand C (2000) Age, costs of acute and long-term care and proximity to death: evidence for 1987–88 and 1994–95 in British Columbia. *Age Aging* 29(3):249–253
- Miller PJ, Mike PB (1995) The Medicare hospice benefit: Ten years of federal policy for the terminally ill. *Death Stud* 19(6):531–542
- Mor V, Kidder D (1985) Cost savings in hospice: Final results of the National Hospice Study. *Health Serv Res* 20(4):407–422
- Murtaugh CM, Kemper P, Spillman BC (1995) Risky business: Long-term care insurance underwriting. *Inquiry* 32:271–284
- Newhouse JP (1992) Medical-care costs – how much welfare loss? *J Econ Perspect* 6(3):3–21 SUM
- Norton EC (2000) Long-term care. In *Handbook of health economics, Volume IB*, Culyer AJ, Newhouse JP (eds) New York, NY: Elsevier Science BV, pp 956–994
- Norton EC, Wang H, Stearns SC (2006) Behavioral implications of out-of-pocket health care expenditures. *Swiss J Econ Stat* 142 (Special Issue): 3–11
- OECD (1998) *The health of older persons in OECD countries: Is it improving fast enough to compensate for population ageing?* Labor Market and Social Policy Paper No. 37. Paris: Organisation for Economic Co-operation and Development
- Olshansky SJ, Ault AB (1986) The fourth stage of the epidemiologic transition: the age of delayed degenerative diseases. *Milbank Q* 64(3):355–391
- Parrillo, JE (1996) The SUPPORT project and improving care for seriously ill patients. *J Am Med Assoc (letter)* 275:1229
- Pezzini LE, Kemper P, Reschovsky J (1996) Does publicly provided home care substitute for family care? Experimental evidence with endogenous living arrangements. *J Hum Res* 31(3):650–676

- Pezzini LE, Schone BS (1999) Parental marital disruption and intergenerational transfers: An analysis of lone elderly parents and their children. *Demography* 36(3):287–297
- Robine JM, Romieu I, Combois E (1997) Health expectancies and current research. *Rev Clin Gerontol* 7:73–81
- Scitovsky A (1988) Medical care in the last 12 months of life: The relation between age, functional status, and medical care expenditures. *Milbank Q* 66(4):640–660
- Seshamani M, Gray A (2004) Ageing and health-care expenditure: The red herring argument revisited. *Health Econ* 13(4):303–314
- Soldo BJ (1985) In-home services for the dependent elderly. *Res Aging* 7:281–304
- Spector WD, Fleischman JA, Pezzini LE, Spillman BC (2000) the characteristics of long-term care users (No. AHRQ Publication No. 00-0049) Rockville, Md.: Agency for Healthcare Research and Policy
- Spector WD, Mor V (1984) Utilization and charges for terminal cancer patients in Rhode Island. *Inquiry* 21(4):328–337
- Spillman BC (2004) Changes in elderly disability rates and the implications for health care utilization and cost. *Milbank Q* 82(1):157–194
- Spillman BC, Lubitz J (2002) New estimates of lifetime nursing home use: Have patterns of use changed? *Med Care* 40(10):965–975
- Spillman BC, Lubitz J (2000) The effect of longevity on spending for acute and long-term care. *New Eng J Med* 342(19):1409–1415
- Spillman BC, Pezzini LE (2000) Potential and active family caregivers: Changing networks and the “sandwich generation”. *Milbank Q* 78(3):347+
- Stearns SC, Kovar MG, Hayes K, Koch GG (1996) Risk indicators for hospitalization during the last year of life. *Health Serv Res* 31(1):49–69
- Stearns SC, Norton EC, Yang Z (2007) How age and disability affect long-term care expenditures in the United States. *Soc Pol Society* 6(3):367–378
- Stearns SC, Norton EC (2004) Time to include time to death? The future of health care expenditure predictions. *Health Econ* 13(4):315–327
- Stern S (1995) Estimating family long-term care decisions in the presence of endogenous child characteristics. *J Hum Res* 30(3):551–580
- Van Houtven CH, Norton EC (2004) Informal care and health care use of older adults. *J Health Econ* 23(6):1159–1180
- Van Houtven CH, Norton EC (2008) Informal care and Medicare expenditures: Testing for heterogeneous treatment effects. *J Health Econ* 27(1):134–156
- Weaver F, Stearns SC, Norton EC, Spector W (In press 2009) Proximity to death and participation in the long-term care market. *Health Econ*
- Welch HG, Albertsen PC, Nease RF, Bubolz TA, Wasson JH (1996) Estimating treatment benefits for the elderly: The effect of competing risks. *Ann Int Med* 124 (6):577–584
- Werblow A, Felder S, Zweifel P (In press 2007) Population ageing and health care expenditure: A school of “red herrings”? *Health Econ*
- Wolinsky FD, Mosely II RR, Coe RM (1986) A cohort analysis of the use of health services by elderly Americans. *J Health Soc Behav* 27:209–219
- Yang Z, Norton EC, Stearns SC (2003) Longevity and health care expenditures: the real reasons older people spend more. *J Gerontol B Psychol/Soc Sci* 58(1):S2–1
- Zweifel P, Felder S, Meiers M (1999) Ageing of population and health care expenditure: a red herring? *Health Econ* 8(6):485–496

Chapter 29

Demography of Informal Caregiving

Emily M. Agree and Karen Glaser

Introduction

The impact of the widespread aging of populations around the world has become of central interest to both researchers and policymakers who wish to understand the broad social implications of these demographic changes. One of the areas of greatest interest has been the potential impact of aging populations on the provision of informal care to older persons by friends and family. These concerns have focused on changes in fertility and mortality that affect the availability of family members to provide emotional, financial and instrumental support, as well as sweeping changes in women's roles and family relationships that have transformed the responsibilities and obligations among family members (Finch 1989; Safilios-Rothschild 1989).

The issue of family care is becoming even more pressing given uncertainties regarding the future health of the older population. Most older people do not have health problems and are important providers of help and support to families; nevertheless, even projections that assume falling rates of disability show large increases in the number of older people with functional limitations, in particular among the oldest old (Jacobozone, Cambois et al. 1998). In addition, several factors have potentially limited the availability of formal help in the community in North American and in many European countries. In the United States, long term care workers tend to be poorly paid, receive no benefits and work irregular hours. High turnover and staff shortages at

nursing homes, assisted living facilities, and home health agencies are widespread, leading many to worry about a long term care "crisis" (Konetzka et al. 2005; Stone 2001). In Europe recent changes to long-term care policies have been widespread, generally with the intent of reducing domiciliary and institutional care by targeting services to the most disabled older people (OECD 2005). For example, even among "generous" providers such as Sweden there has been a significant decline in home help provision to older persons, and an increase in the number reliant on family care (Sundström et al. 2002). A consequence of such changes is likely to be a reduction in formal help available for the less disabled. Other countries have far less developed long term care policies and systems, and rely even more on family members for care (Hussein and Manthorpe 2005). The family support available to older people with assistance needs is therefore high on many policy makers' agendas.

Furthermore, the U.S. and many other societies in both developed and developing countries have experienced similar socio-demographic trends (i.e., declines in marriage and childbearing; rises in divorce and cohabitation; and increases in female labor force participation) (Coleman 2000; Stevenson and Wolfers 2007). Given such changes, even though extensive survey evidence points to high levels of interaction between older people and their families, there are concerns that the availability of family care for older people may decline just as the numbers needing it increase. Such a decline would have major implications for public policy and the public purse, and also for the well-being of the older population. The relationship between demographic change and care, and the differential use of informal and formal care resulting from such changes, is consequently at the center of current policy concerns.

E. M. Agree (✉)
Johns Hopkins Bloomberg School of Public Health
Baltimore, MD 21205, USA
E-mail: eagree@jhsph.edu

Scope of the Chapter

In this chapter we first review trends in population composition and population health that affect the demand for informal care, and the supply of caregivers. We then examine how the profiles of informal caregivers have evolved in conjunction with these demographic changes, and variations in caregiving across cultures in different parts of the world. Finally, we discuss new trends that improve the ability of older persons with disabilities to function independently, such as increases in the use of assistive technologies.

Demographic Trends Affecting Informal Care

Demographic trends have produced countervailing effects on the need for and nature of informal care. Most well known are the ways in which the aging of populations, with their concomitant declines in fertility, contribute both to growth in the demand for care and also to potential declines in the availability of children to provide care. At the same time, increased longevity and improvements in functional health promote more independent living among the older population and increased availability of same-age caregivers, such as spouses and siblings.

Population Aging

Although for many years not of much interest to demographers, population aging is a universal phenomenon, the inevitable result of declining fertility and advancing life expectancy. Thus at this time the older population is growing both in absolute size and as a share of the population. For example, in the U.S. within the next thirty-five years (and in many European countries within the next fifteen to twenty years) a fifth of the population will be over the age of 65. The initial evolution to older age structures prompted by the first demographic transition has been amplified by a more recent shift to “lowest low” fertility and substantial improvements in survivorship. This latter trend in particular is driving large increases in the numbers

and proportions of the “oldest old” aged 85 and over: precisely the group most likely to need care. By 2020, these groups will account for 3–4 per cent of the population of many industrialised countries, compared with 1–2 per cent today. Even in the developing world where fertility has remained persistently high, improvements in survival have increased the sheer numbers in the older age groups (Shrestha 2000). In fact, almost 60 million persons aged 60 and older live in Africa, where the total fertility rate is about 5 children per woman. The growth of the older population is also increasing faster in the developing world than in the more developed regions, and only 32 per cent of all persons aged 60 or older live in Europe or North America (Velkoff and Kowal 2007). As the age structure of populations rectangularize, intergenerational and inter-cohort relations are affected, raising questions about the nature of care for the elderly.

Declining Fertility

The changes in fertility and mortality that lead to population aging play out in the family as well. Lower birth rates mean smaller families; increasing education for men and women has delayed age at marriage, and increased longevity means more generations coexisting. Rosenthal (2000) points out that these changes often promote “doomsday” thinking about the future of informal caregiving, focusing on the shrinking pool of adult children to be caregivers, and the growing number of years that older parents might need care. While some of these concerns may be overstated, the increasing size of the older population and the confluence of structural and social changes in the family do mean that the demand for caregiving is increasing while the supply of traditional family caregivers is diminishing.

Concerns about declining fertility often stem from a comparison between the relatively high fertility of the parents of the baby-boom generation who comprise today’s elderly (those born in the late 1930s and early 1940s) with more recent cohorts that have had fewer children and higher levels of childlessness (Grundy 1999). However, cohorts born before the 1920s experienced similarly high levels of childlessness and many in these cohorts did not marry. The post war baby boom was more pronounced in the U.S.

than in many European countries and, until the late 1960s, fertility was substantially higher in the U. S. For example, the TFR in the U. S. peaked in 1957 at 3.8 compared to a TFR of 2.9 in Britain (Armitage and Babb 1996; U.S. Bureau of the Census 1975). Between the mid-1960s and 1970s fertility rates fell by approximately 38 per cent in U.S. and the U.K., reaching below replacement level by the mid-1970s (Werner 1988). However, since then fertility has reached replacement level in the U.S. while in most of Europe the total fertility rate has stayed below this. However, recent evidence shows increases in fertility in the U.K., France, Sweden, Denmark and Finland (Dunnell 2007).

Moreover, children are more likely to survive to older ages; for example, 95 per cent of those born today are likely to survive to age 50 (the most common age group for caregiving) when compared to those born in 1926 when only 82 per cent survived. In addition, among people aged 80 and over the proportion with at least one living child is actually increasing and by 2025 will be greater than for any past generation (Murphy and Grundy 2003). Furthermore, despite the low fertility projected for those born in 1960, as many will have living children as those born in the 1920s, and more will have two or more children (Murphy and Grundy 2003).

Though policymakers often focus on declining fertility rates, studies have shown that reduced fertility is not necessarily associated with reduced support among older people in either developed or developing countries (Knodel et al. 1992; Tomassini and Wolf 2000a). For example, Italy's low fertility rate (a total fertility rate per woman of 1.24 compared with 2.1 for the US in 2006) does not appear to have led to a reduction in the availability of family care and support for older people: Italy continues to have much higher levels of intergenerational coresidence when compared with other industrialized countries (Glaser and Tomassini 2000).

However, total fertility rates reflect both changes in family size, and the proportion of women and men who never have children. Declining family sizes for parents is less of a concern for the availability of children for caregiving than is the level of childlessness. Childlessness varies quite substantially across countries and cohorts, from as low as 5 per cent of those age 70 and older in Japan, to around 20 per cent in the U.S. and Western Europe, similar to rates experienced

by cohorts in these countries at the beginning of the twentieth century, when life expectancy was much lower (Koropeckyj-Cox and Vaughn 2007). Across countries, studies show that those without children generally use more formal long term care services including nursing homes (Cafferata 1987; Freedman 1996; Larsson and Silverstein 2004) though they also are more often actively involved in voluntary organizations that help others (Cwikela et al. 2006).

However, some researchers have questioned whether high levels of childlessness, especially for Western Europe, can continue. Sobotka and Testa (Forthcoming) argue that unprecedented increases in the age at first birth mean that fewer men and women in current cohorts will reach old age without children as resources, but the increases in generation length that accompany this behavioral change mean that more adult children may be balancing responsibility for children and parents at the same time – the so-called “sandwich” generation (Agree et al. 2003; Evandrou and Glaser 2002).

Timing of Marriage and Childbearing

In addition to affecting the numbers and types of family members potentially available for care, trends in the *timing* of demographic events like marriage and childbearing also are responsible for variation in family structures. Timing of first births tends to be carried across generations in families. Analyses across the developed world show a substantial degree of intergenerational transmission in total family size (Testa and Grilli 2006) and also the age at which people have their first child, especially between a mother and daughter's first births (Barber 2001; Liesbeth and Liefbroer 2008). In families where early parenthood is transmitted across generations, the years between generations are small and relations among family members are altered by the large number of roles they occupy, and obligations they may have to those in other generations (e.g. Burton and Bengtson 1985). At the same time, increases in childlessness and delayed childbearing decreases the number of years spent in family roles for many adults and later ages at first and last birth also increases the average number of years separating generations. This in turn has both social and economic effects, altering the

tasks which family members are likely to help each other with, the importance of inheritances, and the types of intergenerational exchanges among kin.

Increased Joint Survival

Improvements in old age mortality mean that increased survival of spouses and siblings has actually added to the support networks of older people in recent years. The most important trend has been gains in life expectancy for men, which increases the number of husbands available to provide care (Redfoot and Pandya 2002; Tomassini et al. 2004). In the United States, Freedman (1996) found that married older persons have about half the risk of nursing home admission of unmarried persons. In England and Wales those who never married had nearly 6 times the odds of entering an institution between 1991 and 2001 compared to their married counterparts (Grundy and Jitlal 2007). While some of this effect is due to the higher socioeconomic status of married relative to unmarried persons, a recent study in Finland confirmed that older Finns living alone had between a 30 and 70 per cent higher risk of being institutionalized than those living with a spouse, and that this difference persisted even when controlling for a large number of economic resources (Nihtilä and Martikainen 2008).

Siblings also are an important part of the care network, and the vast majority of older persons have one or more siblings alive and living close by (Miner and Uhlenberg 2004), though sisters are more likely to be close and in more frequent contact than brothers (Cicirelli 1995). Siblings also have been shown to be important in deferring institutionalization for older Americans (Freedman 1996). As the product of larger families, siblings are particularly salient members of the caregiving network for the aging baby boom cohort, and increases in longevity will help to attenuate the effects of smaller family sizes on availability of siblings for care in the future, as more siblings grow old together.

Thus, for most older people in the developed world in the near future there is likely to be a greater pool of kin available to provide care if necessary, and indications of postponement and later ages of first birth imply that future elderly may continue to have

adequate numbers of children (Sobotka 2004). Therefore, the long-term decline in fertility is likely to have an impact, but this is relatively far in the future (Murphy and Grundy 2003).

Declines in Disability Offset Aging of the Population

There is now substantial evidence that older persons are healthier on a number of indicators than in the past (Kramarow et al. 2007), and estimates indicate that twenty per cent or less of the population aged 65 and older in the United States report disabilities (Schoeni et al. 2001, 2008). A number of studies show that the burden of disability has been declining for the past 20 years both among older Americans (Freedman et al. 2002, 2007; Manton et al. 2006; Schoeni et al. 2001, 2008) and the old in several other more developed countries (OECD 2007; Robine et al. 1999; Waidmann and Manton 1998). In the United States, Schoeni and colleagues estimate that disability among the older population declined by 0.2 percentage points per year from 1982 to 1996, accelerating to an annual decline of 0.3 percentage points from 1997–2005 (Schoeni et al. 2008). However, the picture for most of the world is not as clear. The OECD reports that disability among the older population appears to be declining in Denmark, Finland, Italy, and the Netherlands, while increasing in Belgium, Japan and Sweden, and remains unchanged in Australia and Canada (OECD 2007). Unfortunately, evaluation of disability trends is hampered by lack of comparable measures of functional health over time and across countries. For example, in the United States trends vary with the measure of disability used, with IADL disability more consistently showing declines across data sources than ADL disability (Freedman, et al. 2002). Both France and the United Kingdom also have evidence of different trends, depending upon the survey used (OECD 2007). Despite declines in disability rates, the aging of the population is expected to result in greater numbers of older persons with disabilities and a larger population in need of long-term care (Spillman and Pezzin 2000). This is mostly due to the projected growth in the size of the age groups in which the prevalence of disability is the greatest – the oldest old (Jacobozone et al. 1998).

Also affecting needs for care are conflicting trends in chronic disease prevalence. Recent evidence shows that medical treatments have reduced mortality from cardiovascular diseases (Cutler and McClellan 2001), and pharmacological treatments have reduced the disabling consequences of such circulatory conditions as hypertension, congestive heart failure and stroke (Cutler et al. 2006; Freedman et al. 2007). Similarly, improvement in treatments for visual impairment and musculoskeletal conditions has also reduced the prevalence of disability that results from these conditions (Schoeni et al. 2008). At the same time, the overall prevalence of arthritis and other joint diseases as causes of disability has increased in recent years (Freedman et al. 2007). Scholars also are currently debating the toll that will be taken on longevity and health by increasing levels of obesity and diabetes around the world (Olshansky et al. 2005; Preston 2005; Reynolds et al. 2005). Arthritis is one of the most common non-fatal causes of mobility disability, and obesity can exacerbate the deterioration of joints and pain from musculoskeletal conditions (Garstang and Stitik 2006).

Concerns have been raised about the growth in the number of older persons with dementia, whose demanding needs often exceed the ability of informal caregivers to provide for alone, and who often need intensive support and formal assistance (MacDonald and Cooper 2007). Although trends in cognitive impairment and dementia are difficult to assess, as national surveys have typically done a poor job of collecting information on mental status, some U.S. studies have shown recent declines in overall prevalence of severe cognitive impairment and dementia (Freedman et al. 2001, 2002; Manton et al. 2005). These declines raise hope that the incidence of dementia may be deferred to the oldest ages, when physical limitations often mandate combinations of formal and informal care for support. Thus at oldest ages more comprehensive care networks may already be in place when dementia occurs. However, as with declines in physical disability, reductions in rates of cognitive impairment do not stem the growth in the absolute size of the population with some form of dementia. Forecasts indicate a substantial rise in the number of people with dementia in the UK and the U.S. in the near future (Knapp et al. 2007; Brookmeyer et al. 1998).

Declines in disability reflect not only changes in underlying health conditions, but also improvements in the environment and in the extent to which individuals

with different levels of physical capacity successfully adapt to their disabilities. For example, Spillman (2004) has pointed out that in the United States the largest improvement in any Instrumental Activity of Daily Living (IADL) was a decline of 3.7 percentage points in managing money during the 1980s, when direct deposit of Social Security benefits became common. Other common technologies, such as cordless phones and microwave ovens also have entered into common use and may be responsible for declines in reported disability and the need for help. Reductions in old age poverty and increasingly educated elderly cohorts also contribute to the improvements in disability rates (Schoeni et al. 2008).

International comparisons of healthy life expectancy indicate that declines in disability in many countries are associated with a shift toward greater duration of mild disability, and a decline in years lived with severe disability (Kelly and Baker 2000; Robine et al. 1999). Declines in ADL disability and later onset of severe functional problems mean more of those older persons who experience disability will have limitations that are amenable to self care. Therefore, while most older persons do not have health problems and many are important providers of help and support to family members and their wider communities, the support and care available to those older persons with assistance needs remains high on many policy makers' agendas.

Social Changes in Family Behavior

The demographic shifts that lead to changes in family structure are occurring at a time of significant changes in patterns of family related behavior. For example, the U.S. like many European societies has experienced rises in divorce, declines in marriage and childbearing, and increases in cohabitation and children born outside of marriage. Cherlin (2004) has argued that obligations are now more negotiable even within marriage. Two possible adverse consequences of this process are anticipated: first increased demand for formally provided services, with implications for public expenditure, and second reductions in the availability and/or willingness of family members to provide support for older people in need of assistance at a time when the numbers needing such assistance are likely to increase.

A number of recent social developments may be assumed to have an effect on family care for older people. These changes are well verified by population statistics and are widely recognized by the general public. They include smaller households and family sizes, more women with paid jobs and consequently with potentially competing family and work responsibilities, and increasing family diversity. Moreover, we know little about changing expectations and preferences toward informal and formal care. Each of these will be examined separately.

Household Composition

The availability of informal caregivers depends not only on the existence of family members, but also on their “true” availability as reflected in their proximity to older relatives, their economic resources, and the competing obligations of family and work. Trends in the household structures of the older population have evolved in response to both demographic changes in increased survival, and increasing state support for older persons in the form of social security programs and private pension systems. Greater longevity, coupled with the increasing desire and ability to live independently, have combined to result in a greater proportion of the older population living alone or with only a spouse in the most developed countries. Despite these changes, evidence consistently shows that family members are still the primary caretakers and emotional supports to older people in both developed and developing countries (Walker and Maltby 1997).

The proportion of older people who live alone has been increasing since the 1960s, although the rate of increase slowed during the 1990s. This trend has been documented in the U.S. and in a number of European countries (Macunovich et al. 1995; Tomassini et al. 2004; Tomassini and Wolf 2000b). It is well established that people with more children are less likely to live alone than those with fewer children (Mutchler 1992; Wolf 1994). As was previously mentioned, women born before the mid-1920s in the U.S. and other European countries like Britain had fewer children than women born in the 1930s and 1940s. The lower fertility of this cohort combined with their higher levels of childlessness may, in part, account for the higher prevalence of solitary living amongst the oldest old. However, recent research in the U.S. shows that the proportion of young

elderly widowed women living alone has decreased, whereas there has been an increase in solitary living among of the oldest widowed women (i.e., those aged 80 years and over) (Macunovich et al. 1995). Reasons for this trend are thought to be a result of the higher fertility achieved during the “baby boom”. Italy, like the U.S., has also seen a decline in the percentage living alone among young elderly unmarried women (i.e., the never-married, widowed and divorced) (Tomassini and Wolf 2000b). In both studies it is suggested that, as the mothers of the “baby boom” generation age, we may witness declines in the proportion of older women living alone, due to the increased availability of kin with whom they may coreside.

Another explanation for the slowdown in the proportions of older people living alone is likely to be the result of an increase in the numbers of older people surviving into old age with a spouse. Although the proportion living with children has continued to decline, an increase in life expectancy and the narrowing of the difference in life expectancy between men and women mean that more older people are living with a spouse, with the potential for mutual care that this brings. Research has repeatedly shown that the most common source of help and support in later life is a spouse (Pickard et al. 2000). However, there is another implication of living longer: caring for an older relative may be more challenging than in the past given that people with ill health are living longer. In addition, the principal social contacts of an older person may be with people who are themselves old, and thus less able to undertake a demanding care regime. Even the children of a very old person may be pensioners themselves.

Proximity and Contact

It is popularly assumed that older people are living farther from their children than in the past and are therefore less likely to be able to rely on assistance close to hand. However, in the United States, the proportion living within an hour travel from one of their children has remained stable for several decades at around 75–80 per cent (Crimmins and Ingegneri 1990; Lee Dwyer and Coward 1990; Lin and Rogerson 1995; Litwak and Kulis 1987; Rogerson et al. 1993; Silverstein 1995). Analysis of the 2004 SHARE study, a cross national survey of the older population in ten

countries in Europe, showed that for all age groups and in all countries 85 per cent of parents have a child living within 25 km (Hank 2007). Moreover, recent research in the United States, which is considered to be a highly mobile society, shows that moving rates for people in the key age groups providing elder care has actually declined (Wolf and Longino 2005). Reasons suggested for this change include: a reduced need for work-related moves (as people are more willing to commute longer distances); an increasing number of dual-income, dual-earner households making it more difficult to move; higher rates of home-ownership rather than home-renting; and an increasing number of people who buy second homes rather than relocate to attractive areas (Wolf and Longino 2005). These trends may also be having an effect in Britain; an examination of residential proximity between parents and their children shows no change between 1986 and 1995 in the average distance and in fact an increase in proximity between 1995 and 1999 (Shelton and Grundy 2000).

In 1984, over 60 per cent of older Americans reported seeing one of their children at least once a week (Crimmins and Ingegneri 1990). The mean values of contact have remained high over time, but Shapiro (2003) reported that gender and marital status of older parents are related to the frequency of contact. He finds variation in weekly contact with children from 55 per cent of older divorced fathers to 85 per cent of older married mothers. As with several other measures of family solidarity, Southern Europeans (e.g. Spanish and Italians) appear to see their children more often than Northern Europeans, but the majority in all countries are in touch with at least one child (Hank 2007; Lowenstein and Daatland 2006; Tomassini et al. 2004). Even in developing countries, older persons who live alone are embedded in close networks of children and other relatives (Knodel and Ofstedal 2003).

Competing Work and Family Responsibilities

The extent of multiple role commitments in mid-life continues to be a critical issue in the United States and Western Europe given that they have experienced similar demographic trends: increases in the proportion of mid-life individuals with living parents, reflecting rises in survival at older ages; increases in co-residence and

dependency among young adults reflecting rises in the age at which children leave and return home, as well as rising ages at motherhood; and continued rises in female labor force participation (DaVanzo and Goldscheider 1990; Soldo 1996; White 1994). In particular, the continuing rise in female labor force participation has led to concerns that increasing commitments outside the home conflict with women's ability and willingness to care for frail elderly relatives (Dooghe 1992).

In the early 1980s research found that multiple role commitments among women were becoming a normative experience (Brody 1981, 1985). Studies in the 1990s documented that being caught in the middle, in terms of simultaneous care giving responsibilities to dependent children and frail parents while in paid work was uncommon (Dautzenberg et al. 1998; Himes 1994; Rosenthal et al. 1989, 1996; Soldo 1996; Spitze and Logan 1990). However, some empirical studies indicate that the extent of multiple roles increased among younger generations, and it is likely that the proportion of men and women juggling work and family responsibilities is rising (Evandrou and Glaser 2002; Moen et al. 1994; Robison et al. 1995). In addition, findings from recent British research studies indicate that while being "caught in the middle", in terms of simultaneous work and family roles, remains an atypical experience. Nevertheless, a higher proportion of mid-life individuals have simultaneously occupied multiple roles at some point over their life course than is indicated at a single point in time (Evandrou et al. 2002).

In contrast to the work on the prevalence of multiple role commitments there has been less research on the consequences. However, most studies have shown that individuals, especially women, appear to add elder care and other family responsibilities to their portfolio of daily tasks without cutting back substantially on paid work or other competing obligations (Glaser et al. 2005, 2006; Henz 2004, 2006; Spiess and Schneider 2003).

Family Diversity

The United States, like other developed countries, has witnessed significant changes in family structure and relationships in recent decades. Perhaps most important are the changes in marital patterns sweeping both the more and less developed world. Increasing

longevity means a choice between longer marriages, multiple marriages, or more years unmarried over an increasingly long lifetime. At all ages, more widespread acceptance and prevalence of cohabitation as an alternative to marriage, childbearing outside marriage, rising rates of divorce among new marriages, and patterns of remarriage and step-parenting have radically altered the definitions of “family” in many countries (Cherlin 1981, 1992; Ermisch et al. 2000; Stevenson and Wolfers 2007). These changes mean that current and future elderly will have more diverse family networks than previous generations (Wachter 1997).

Changes in marriage and union patterns affect not only those forming (and dissolving) these unions but also their relatives. When two adults divorce, one set of parents may involuntarily lose their grandparental roles. Similarly, in the case of remarriage, a child may suddenly find herself or himself with an additional set of grandparents, beyond the two original pairs. It is this “complex reconstitution” of multi-generational family ties which has created the greatest number of new, alternative family relations, whose character and norms are still evolving (Bengtson et al. 1990).

Concerns have been raised that these changes in family behavior may lead to the erosion of family support to older persons. Given these concerns, it is surprising how little we know about the impact of such trends on family care. On the one hand, there is a popular perception that increasing rejection of traditional family roles and relationships means that families have become less willing to care for one another. This idea is to some extent supported by empirical research. For example, most researchers have considered that the experience of divorce weakens family ties and thereby reduces mutual support.

On the other hand, the notion of what “the family” means has changed, with a more flexible and diverse concept gaining ground. Among “family members”, reciprocity and affection (in addition to obligation) are key influences on intergenerational relationships and exchanges (Askham et al. 2007; Finch 1995). As the notion of “family” life changes, and as attitudes toward family issues bring greater acceptance of divorce and increasing tolerance of different family forms, the negative impact of such changes for support in later life may be disappearing (Thornton and Young-DeMarco 2001).

There is a considerable literature on the relationship between older adults’ current marital status and patterns of support. The findings suggest that being

divorced negatively associates with contacts and support (particularly for men, but most studies have measured only contacts and only a few transfers and co-residence) (Crimmins and Ingegneri 1990; Eggebeen 1992; Grundy and Shelton 2001). Most of the work on the long-term impact of divorce has focused on outcomes for children, and there have been few investigations of the consequences for support in later life. It has been shown that, in comparison to those in intact marriages, the experience of divorce and remarriage mostly decreases contact and relationship quality with adult children as well as perceived support from children (or from any source) (Aquilino, 1994; Bulcroft and Bulcroft, 1991; Cooney and Uhlenberg 1990; Furstenberg et al. 1995; Kalmijn 2007; Lye et al. 1995; Pezzin and Schone 1999; Roan and Raley 1996; Shapiro 2003). Fewer studies have focused on transfers between parents and their adult children and here the evidence is less clear: some studies report no relationship between parental divorce and help given or received (Aquilino 1994; Pezzin and Schone 1999) whereas others report a negative relationship with time and money transfers (Furstenberg et al. 1995; Kalmijn 2007). A recent paper shows that, contrary to previous studies, older separated parents in the U.K. are more likely to receive help from children when compared with those in a current partnership (Glaser et al. 2008).

Trends in the Profiles of Caregivers: Who is Caregiving?

As noted above, most older persons in the United States and other more developed nations live the majority of their remaining years in good health and with little disability or need for care. However, once older people experience ill health or a bereavement, family members continue to be the main providers of support and care (Soldo and Hill 1995). As previously mentioned, in most industrial societies only a small portion of care received by older people is provided by public services; the great majority of care continues to be provided by family members including other older persons, particularly spouses (Pickard et al. 2000; Sundström 1994; Walker and Maltby 1997). Most studies suggest that the demographic availability of kin is an important predictor of informal care arrangements,

with married older persons most likely to depend on their spouses, and unmarried older persons most likely to have a child (usually a daughter) providing care (Soldo et al. 1990; Stoller and Cutler 1993). According to the National Long Term Care Survey, in the 1990s about two-thirds of all informal caregivers were either a spouse or child (Spillman and Pezzin 2000). There is also evidence that the network of unpaid caregivers is dynamic, with caregivers entering and exiting based on functional need (Jette et al. 1992; Seltzer and Li 2000) and that the amount of assistance provided by the informal caregivers is sensitive to changes in functional status (Edelman and Hughes 1990; Freedman et al. 2004; Miller and McFall 1991).

Formal care rarely constitutes the primary source of care; only in a few countries like Denmark (which has the one of the most extensive systems of home care services) do a large proportion of older people receive regular help or assistance from public social services (Walker and Maltby 1997). More often formal care is obtained as a complement to existing informal care networks.

Changes Within Family: Spouse vs. Children vs. Siblings

The primary caregivers to older persons with daily care needs are almost always spouses or adult children. Among older disabled persons who receive care, the share of that care provided by spouses or children has risen from 80 per cent in 1994 to 84 per cent in 1999 (Spillman and Black 2005). Among older persons who actually have these family members available for care, this proportion is as high as 90 per cent (Spillman and Pezzin 2000). Given the overwhelming reliance on these caregivers for support, it is unfortunate that little national data has been collected on the caregivers themselves (Wolff and Kasper 2006). All of the information in this section is drawn from the U.S. National Long Term care Survey (NLTC) Informal Caregivers supplement.

While spouses are most often the preferred caregivers, a slightly higher proportion of children are reported as informal caregivers by disabled elders, and this has been rising in recent years. From 1989 to 1999 the proportion of family caregivers that were spouses remained roughly the same, at about 40 per cent, while the percentage that were adult children

rose from 36 to 44 per cent (Center on an Aging Society 2005). The proportion of spouse caregivers may be underreported however, because husbands and wives often help each other in ways not recognized as “caregiving” by the couple.

Not only is the share of informal care by children rising, the children who provide care are increasingly likely to be elderly themselves. Almost 13 per cent were age 65 or older (Spillman and Black 2005), and the proportion between 45 and 64 years rose from 58 to 68 per cent during the 1990s (Wolff and Kasper 2006). The age of the parents that they care for has risen as well. About 40 per cent of the caregivers were assisting parents age 85 or older in 1999, up from 34 per cent in 1994 (Spillman and Black 2005). The rising age of caregivers and recipients means that an older population with greater care needs is placing physical demands upon an increasingly elderly group of caregivers. It is therefore becoming increasingly important to explore supplemental formal assistance to alleviate the burden on aging caregivers and also to ensure that the care needs of older parents are being met.

Women, whether as wives or adult children, are much more likely than men to be caregivers, but husbands are often devoted caregivers to their wives when ill. However, wives report spending the greatest number of hours in caregiving (28 hours per week) compared with husbands, who report an average of 15 hours per week (Center on an Aging Society 2005). Spouses are at more risk than other caregivers for their own health and well being. The average age of spousal caregivers has risen over time. Spillman and Black (2005) report that 11 per cent of caregiving spouses were age 85 or older in 1999, an increase of almost 3 percentage points since 1994. In addition, spousal caregivers are more likely than others to perform their tasks alone (68 per cent are sole caregivers versus 34 per cent of others) (Wolff and Kasper 2006).

The proportion of older persons receiving care from siblings is quite low, and mainly comprised of those without closer kin, such as spouses or children (Cicirelli 1995; Connidis 1994). However, while siblings are rarely involved in hands on caregiving, they provide substantial emotional support, and report high levels of contact, especially among those who are widowed or divorced (Campbell and Martin-Matthews 2003; Miner and Uhlenberg 2004). They also are often seen as “back-up” or “emergency” sources of care – latent but available when needed (Cicirelli 1995; Gold 1996).

The importance of siblings as informal caregivers is likely to rise in the near future, as members of the baby boom cohort, who come from large families and have experienced unprecedented levels of divorce, reach older ages.

Differences by Socio-Economic Status

Socio-economic differences in health and life expectancy have increased over the past decades suggesting that mainly higher socioeconomic status groups have benefited from improved cure and care practices for older people (Kunst et al. 2005). While health inequalities have received widespread attention, there has been less research examining whether some groups are disadvantaged in terms of family, private or public care provision.

Socio-economic differences in the propensity to need care are thought to be related to the following factors: (i) SES inequalities in health which increase the likelihood of being in poor health, and therefore in need of help, in later life; (ii) SES differences in demographic factors (e.g. sex and age) which influence the predisposition to use help (for example, families in lower SES groups have more children living in the household and in the geographical vicinity compared to families in higher SES groups, which may account for the higher use of informal care among the former group); and (iii) the greater availability of social and material resources among higher socio-economic status groups, which influences the availability of kin to provide care (e.g. the availability of spouses and children) and enables the purchase of assistance (privately paid help) rather than the need to rely on family members or friends.

In general, studies which examined the relationship between SES (e.g. income, education, ethnicity, occupation, tenure status) and the use of help among older people found a negative association with informal help from kin and the use of formal services, and a positive association with privately paid help (Almond et al. 1998; Broese van Groenou and van Tilburg 2003; Larsson and Silverstein 2004). However, recent research examining differences across countries in the receipt of assistance found no statistically significant relationship between indicators of SES (e.g. education or social class) and the

use of informal or formal help (Motel-Klingebiel 2003; Shea et al. 2003). Moreover, SES appears to behave in different ways across societies. For example, the association between better financial conditions and solitary living is not found in all societies (Wolf 1995). Home ownership and high education (two proxies for higher social status) were found to be strongly positively associated with co-residence in Italy but not in Britain (Glaser and Tomassini 2000). In addition, research in the U.S. which has examined the relationship between ethnicity (an often used proxy for SES) and the use of help among older people has shown that Whites were more likely than African-Americans to use help from children, whereas the latter group were more likely to use help from non-kin (e.g. friends, neighbours, or co-workers) (Hatch 1991).

Few cross-national studies have examined disparities in the use of help among older people (Broese van Groenou et al. 2006; Motel-Klingebiel 2003; Shea et al. 2003). Broese van Groenou et al. 2006 found SES differences in informal help at older ages to be larger in The Netherlands and Britain than in Italy, even when key socio-demographic characteristics (such as age, gender and health) were taken into account. SES differences in formal help largely disappeared (except in Italy) once need (defined by health) was controlled for.

Men's Roles in Caregiving

Informal care most often means female care, as women are consistently shown to be the main providers of services within the family. Daughters are more likely than sons to provide care, especially personal care, and sons more likely to provide instrumental support, as is consistent with assumptions about "gender-appropriate" forms of caregiving (Arber and Ginn 1995; Campbell and Martin-Matthews 2000 2003; Chang and White-Means 1991; Matthews and Heidorn 1998; Stoller 1990). However, although sons do provide help with instrumental tasks, they are more likely to help when needs are intermittent, whereas women are more likely to help when consistent aid is needed (Stoller 1990). Matthews and Rosner (1988) found that brothers more often provided help sporadically, usually limiting themselves to specific tasks, such as financial assistance or household repairs.

The female advantage in mortality at all ages has led to a gender gap in life expectancy, and much greater proportions of women at older ages out-survive their husbands. Thus, more women than men are unmarried when they reach the ages at which they are most in need of care. Older men continue to rely upon wives for care, while the reverse is much less often the case. It is thus difficult both to elucidate true gender differences in terms of the propensity to provide care among husbands, and to understand the nature of the care that they provide. Still, those husbands who provide care report substantial caregiving commitments. Studies in Canada and the U.K. report husbands spending between 15 and 20 h per week in caregiving to wives (Frederick and Fast, 1999; Hirst 2001). Russell (2007) interviewed men providing care for wives with dementia, and found that the most successful reported applying career skills, such as time management, with traditional caregiving activities.

There may yet be substantial changes in the gender distribution of care. If divorce rates continue to increase and fertility remains low or even declines further, men will spend less of their lifetimes in family roles (Eggebeen and Uhlenberg 1985), and divorce will separate them from their biological children. Most research on the negative impact of divorce on support and caregiving from adult children has shown this is to be particularly true for fathers, who are much less likely to live with an adult child and receive fewer total hours of informal care (Pezzin and Schone 1999). The same study also found that increased complexity of family ties, such as remarriage and presence of step-children, further weakened family support at older ages.

As cohorts with higher rates of cohabitation, divorce and remarriage enter old age, it will be essential to understand what resources will be available to men, and how increasingly complex families interpret their obligations to each other. While most research on family care focuses on sons and daughters, daughter and sons-in-law provide substantial amounts of care, and the loss of spouses to assist with caregiving may have an as of yet unknown effect on informal care resources in later life. For example, we need to understand if there are differences in the responsiveness of daughters and sons to the needs of divorced parents, and whether sons are more or less responsive to the needs of unmarried, or remarried fathers.

Caregiving in the Developing World

In developing countries the care of older people is becoming an important issue. The potential erosion of family support in societies with little or no government institutional protection for older people is a critical situation (Palloni 2001). The availability of formal services is still a limited option and formal long term care remains stigmatized in these areas. Despite the tenacity of families in the developing world, these regions are not immune to the same changes that have dominated the picture in the more developed world. Migration, increased female labor force participation, and changes in family availability have led to some concern about the ability of families to continue to care for their older members. As in the U.S. and Europe, many of these countries also have seen increases in cohabitation as an alternative to marriage, as well as rising divorce rates among younger cohorts. Ongoing rural to urban migration among younger adults has led to concerns about the aging of rural areas, and the shrinking pool of close family members for support of the elderly. These locations have the least access to medical care and other services, and those who age in place here may increasingly be relying upon more distant relatives, paid care, and the generosity of their local communities (Kinsella and Velkoff 2001; van der Geest et al. 2004). A number of countries in Asia also have experienced below replacement fertility, leading to more rapid population aging, and increased pressures on constrained social and economic welfare programs – China being the most dramatic example (Bhakta 2003).

These changes will all have profound implications for future cohorts as they age. Fluidity in family and household relationships has long been recognized as a feature of the developing world, but the lack of data about family members outside the household has slowed research on ways in which family support changes in the course of socioeconomic development.

In the U.S. and Northern Europe the availability of public transfer programs (i.e., pension and health care systems), and the predominately good health of the older population, appears to ensure that they are able to meet their own needs. For example, the recent

Survey on Health Ageing and Retirement in Europe (SHARE) shows little routine transfer of resources between elderly parents and their adult children (Albertini et al. 2007). In Asia, however, between 68 and 91 per cent of older adults receive financial support from family members (Agree et al. 2002; Andrews and Hennink 1992; Biddlecom et al. 2003; Knodel and Chayovan 1997; Mason 1992). Within Asia, Agree and colleagues show that family support follows very different patterns across countries. For example, social network analysis of transfers in Taiwanese and Filipino families show that exchanges with non-nuclear kin are much higher in the Philippines while familial support tends to be concentrated in the parent-child-grandchild lineage in Taiwan (Agree et al. 2005). It is also the case, that even in these countries where reports of family support are high, the correspondence between needs and care is not always perfect. For example, Biddlecom et al. (2003) note that in countries with strong Confucian ideals of filial obligation, parents may accept material support from children regardless of need, in order to honor their cultural norms. At the same time, the Taiwan Survey on Health and Aging has shown that as much as one-fifth of the older population reported difficulty with daily activities, but received no help with these activities (Hermalin et al. 1992).

While research on the well being of older persons in the developing world is growing, less is known about regions other than Asia, and we cannot assume that relationships found there are universal. In Latin America, with the exception of recent analyses largely based on the SABE data, there has been little research on family support transfers among large representative samples of older people (De Vos et al. 2004; Department of Economic and Social Affairs Population Division United Nations 2005; Palloni et al. 2002; Saad 2003). Studies based on the SABE data show high levels of intergenerational exchanges, with between 85–93 per cent of respondents aged 60 and over receiving some form of help (Saad 2003). This latter study is also one of the few in Latin America to investigate support transfers taking into account differences in family structure, although receipt of help from kin and non-kin is not distinguished (Saad 2003).

Africa's growing elderly population poses particular problems, since it is occurring in countries with relatively high fertility, substantial poverty, and dramatic

levels of HIV and AIDS decimating the population of working age adults. Adamchak (1989) reported almost twenty years ago that African nations were experiencing declining family support to their older populations, and van der Geest (2004) reports that this remains true in Ghana, with older parents in rural areas the most vulnerable to the absence of their children. The rising level of HIV/AIDS prevalence in many Sub-Saharan African nations reduces the availability of adult children for support, and also creates new responsibilities among the elderly, first to care for their own children if they fall ill with AIDS, and then as the primary caregivers to their grandchildren (Merli and Palloni 2006). The caregiving responsibilities of the older generation take a toll on their own health and financial well-being (Knodel 2006; Merli and Palloni 2006). Yet, the majority of health and nutrition programs in African nations are designed to combat infant and child mortality, rather than the diseases of old age. In many villages, the only health care services available are outreach facilities designed for the distribution of contraception and maternal and child health care (Adekun 1986). Governments in such relatively young nations with low life expectancy at birth, few resources, and that are facing dramatic public health problems such as AIDS do not see as necessary an extensive public health infrastructure for chronic disease treatment and long term care. However, the increases in sheer numbers of the older population combined with high morbidity and mortality among the working age population has begun to put pressure on both the family and the national health care systems to respond.

Tradeoffs Between Informal Care, Formal Care and Self Care

The older population spans 40 years of age, and thus is quite heterogeneous in terms of health and life circumstances. The diversity of care strategies employed in the face of disability is equally broad. It reflects not only variability in the nature and severity of functional health, but also the availability of family members, as well as economic and social resources and individual preferences. A substantial literature documents strong preferences for family and other unpaid helpers to provide care at home (Kasper et al. 2000; McAuley and Blieszner 1985). The salience of family and

friends as informal caregivers has been shown across both the developed and developing world (Arno et al. 1999; Doty 1986; Liu et al. 2000; Stone et al. 1987). More recently, research on assistive technology use among older persons indicates that the use of devices is widespread, and in some cases is more extensively relied upon than personal care (Agree and Freedman 2003; Agree et al. 2004).

Relationship of Informal and Formal Care

Family care may be relatively plentiful and inexpensive to the public purse, but it may have considerable disadvantages for the people concerned. There is some evidence to suggest that, in some circumstances, older people may prefer professional assistance (Arber and Ginn 1991; Daatland 1990; Jarvis et al. 1998). Studies in the United States show that the availability of a spouse or adult children reduces receipt of formal care (Kemper 1992). This may be ascribed to a preference to avoid the presence of “strangers” in the home, and also for intimate care (such as help with bathing and toileting) to be provided by a loved one. There is some evidence for a hierarchy of preferences for sources of care, whereby individuals first rely upon close kin (spouse, then child), then turn to extended family. In this hierarchy, those needing care come to rely upon non-kin only as a last resort (Chappell 1991; Jette et al. 1992; Shanas 1979; Spillman and Pezzin 2000), although not all research confirms this sequential ordering (Miller 1991). In a study in the United Kingdom, Arber and Ginn (cited in Allen and Perkins 1995) found that the most popular option was care within a marital relationship; the next was care in the older person’s own home from relatives of the same generation; followed by care from children. The least favoured option was care in a married child’s home by the child. This hierarchy suggests the disfavour with which a relationship of dependence or obligation is viewed in certain societies. In a survey in 1997 commissioned by Age Concern England, 40 per cent of men and 35 per cent of women aged 65 years and over would prefer a mixture of family support and professional care in their own home if in the future they could not manage on their own (Glaser et al. 1998).

However, differences across countries in the payment structure for formal care raise questions about the comparability of findings for circumstances where the alternative is paying for assistance offered on a commercial or means-tested basis. Findings in the U.S. show that reductions in the use of formal care during the 1990’s (owing to changes in funding for paid care) were smaller among those whose primary care was from children, rather than their spouse, which is consistent with qualitative evidence that spouses tend to be the most highly committed and available caregivers. It also may reflect a greater need to purchase supplemental care by adult children, who are less likely to be coresident caregivers and who often juggle a greater number of competing responsibilities, (Spillman and Black 2005).

Some of the demographic trends described above are related to the increased use of formal care alone or in combination with informal help. For example, those who are living alone are more likely to employ paid caregivers (Houde 1998; Kelman et al. 1994; Tennstedt et al. 1993). In the United States, African Americans have consistently been found to be much less apt to use formal care and to adopt informal care earlier (Cagney and Agree 1999, 2005; Kemper 1992; Miller et al. 1994; Tennstedt and Chang 1998). Socio-economic status exhibits a curvilinear relationship with formal care, with the highest levels of use among the poorest and wealthiest (e.g. Kemper 1992; Liu et al. 2000).

Of course, the most important determinant of whether formal or paid home care will be introduced into the care system is the severity of underlying health care needs. Greater severity leads to the accumulation of multiple sources of care and more intensive care (Houde, 1998; Kelman et al. 1994; Noelker and Bass 1989; Tennstedt et al. 1993). Those with mixed helper networks receive care more often, from a greater number of helpers than those with informal networks, at all levels of disability (Soldo et al. 1990). There also is evidence that informal caregivers rarely withdraw from caring altogether when paid help is introduced, though they may reduce their hours of care (Jette et al. 1992; Kelman et al. 1994; Miller and McFall 1991; Peek et al. 1997; Tennstedt et al. 1993). Complete replacement of informal caregiving with formal sources of assistance is most often the result of the loss of a primary caregiver, such as a spouse who dies, or a child who moves too far to provide hands on care (Jette et al. 1992; Tennstedt et al. 1993).

Self Care: The Role of Technology

Assistive technology is widely used by older persons with disabilities, both alone and in combination with informal and formal care (Agree and Freedman 2003; Agree et al. 2004). The use of portable devices, such as canes or wheelchairs, and of home modifications, such as grab bars or ramps, allows older persons with some level of physical disability to function more independently, and thus is an option of great interest to those who wish to promote aging-in-place. While research for many years equated long term care with personal assistance, national surveys of health and aging in the United States indicate that AT use grew rapidly throughout the 1980s and 1990s (La Plante et al. 1992; Manton et al. 1993; Russell et al. 1997). By 1994 more than 75 per cent of disabled older adults reported the use of some form of AT on a regular basis (Russell et al. 1997) For older Americans as a whole, estimates for assistive device use are estimated at about 14–18 per cent (Cornman et al. 2005). Of all forms of AT, mobility-related devices are most often used, with canes and walkers being most common (Agree and Freedman 2000). A greater proportion of individuals with mobility limitations rely on AT than personal care (Agree and Freedman 2003; Agree et al. 2004). Less is known about device use in other countries, as little representative data has been collected on the topic.

Prevalence reports of device use do not, however, capture the complex patterns of accommodation among those adapting to disabilities. There is wide variation in the number of devices owned and the extent to which they are actually used by older persons (Gitlin 1995; Gitlin et al. 1996; Mann et al. 2002; Tomita et al. 2004). One study indicates that older persons own between 2–14 items on average, with only about half of all devices used on a regular basis (Gitlin et al. 1996). In an exploratory study Klinger and Spaulding (2001) found that of 30 older persons with osteoarthritis owning 133 devices, 43 per cent of devices were used at least once a day, but 37 per cent were never used. Van Der Heide et al. (1993) found that more recent onset of disability was associated with lower rates of use relative to longstanding impairments.

In general, the predictors of AT use are less well studied than those for personal care, but, as with personal care, the number and severity of activity

limitations has been shown to be a major predictor of assistive device use (Agree and Freedman 2000; Gitlin et al. 1996; Hartke et al. 1998; Verbrugge et al. 1997; Verbrugge and Sevak 2002; Zimmer and Chappell 1994). Evidence of declines in severe disability may mean that more persons with moderate disability will be able to employ self-care strategies, such as assistive devices.

The Relationship Between Assistive Technology and Personal Care

Over the past twenty-five years, U.S. data indicate declines in the proportion of older persons with chronic disabilities who used personal assistance, while the use of equipment increased. Manton et al. (1993) were among the first to note this trend for the 1980s, and similar findings have been reported for the more recent decades. Spillman and Black (2005) reported that the proportion of chronically disabled persons using personal care declined from 66 to 55 per cent between 1984 and 1999. Over the same period there was an increase from 10 to 19 per cent in the use any assistive devices. Between 1992 and 2001, Freedman, et al. (2006) report that the use of assistive technology *without* personal help among older persons with ADL difficulties rose from 26 to 32 per cent, an annual increase of 3.6 per cent, while the proportion depending upon personal care declined by 1.4 per cent per year. Using decomposition techniques, they estimate that close to half of the decline in personal care dependence over the 1990s can be attributed to growth in the use of assistive technology, though reductions in underlying difficulty did more to offset the amount of growth in personal care use that would have come about as a result of population aging.

How individuals employ combinations of informal care, formal care and assistive technology is not well understood. Some studies suggest there are hierarchies of accommodation. Verbrugge and Sevak (2002) found that severe disability with a specific task was most commonly associated with use of both personal care and AT, followed by equipment use alone and then personal care only. Agree et al. (2004) obtained similar results, finding that older persons with less severe mobility limitations were most likely to use equipment

alone whereas those with more severe limitations were most likely to use a combination of personal care and equipment.

A major question in long term care research has been the substitutability of different types of care for one another, though prior studies focused mainly on the substitutability of formal and informal personal care. Studies of the joint use of AT and personal care have examined the potential for AT to substitute for personal care (Agree and Freedman 2000; Allen et al. 2001; de Klerk and Huijsman 1996; Hoenig et al. 2003; Mann et al. 1999). If AT can substitute for personal care, potentially great reductions in health care costs could be achieved as well as improvements in the autonomy and independence of older persons with disabilities. Mann's 1999 study showed that AT use was associated with reductions in paid home care, but did not examine informal care. In cross sectional studies in the United States, some evidence for substitution has been found. Allen et al. (2001) reported that the use of canes and crutches was associated with fewer tasks and hours of both informal and formal care, but wheelchairs and walkers had no effect. Hoenig et al. (2003) also found that AT use for ADL limitations was associated with fewer hours of help. Agree and Freedman (2000) found that simple assistive technology, such as canes, had the potential to substitute for informal care, even after controlling for the underlying degree of disability severity, but that wheelchairs were associated with greater use of formal care. In a more recent paper, they found that assistive technologies are most often complementary to personal care, but the groups that substitute were those who are unmarried, highly educated, or who had no cognitive impairments (Agree et al. 2005). Taylor and Hoenig (2004) also report that the extent to which assistive technology may reduce the amount of personal care depends upon whether it fully resolves task difficulty. They found that those with residual difficulty were more likely to subsequently adopt more hours of personal care than those who eliminated their difficulty entirely.

Cognitive impairment is a special case for the use of assistive technology. Cross-sectional evidence suggests that individuals with cognitive impairment may be less apt to rely on assistive devices (Agree and Freedman 2003; Hoenig et al. 2003; Verbrugge and Sevak 2002). Mann and colleagues suggest that older persons with cognitive impairments almost always rely on a family

member, use assistive technology less often, and require close supervision to use devices (Mann et al. 1992; Nochajski et al. 1996; Yang et al. 1997). In these cases, it is not only the older person who benefits from the technology, but also informal caregivers, for whom assistive technologies may reduce some of the physical burdens of caregiving.

Little research has been done to examine how family structure affects the balance of assistive technology and informal or formal care, but marital status has been shown to be an important determinant of device use (Agree et al. 2003, 2005). Those who are unmarried are more likely to turn to technological solutions than those with a spouse available for care. Interestingly, one study found that fear of losing personal care may be a barrier to adoption of assistive technology (Lilja et al. 2003).

The decision-making surrounding the use of assistive technology and informal care is clearly complex and idiosyncratic. Some decisions are made jointly, as when an older person is discharged from hospital after an acute episode. Alternately, some older persons use all means available to them to avoid dependence upon others, or have no others on whom to depend. Still others employ neither technological nor human assistance—data from the 2005 Pilot Study of Aging and Technology shows that 28 per cent of persons with lower body limitations lived in homes with unmodified environmental barriers, indicating a potential need for AT interventions, and other forms of help (Freedman et al. 2006). More needs to be known about the ways in which technology can be used to improve quality of life for older persons with encroaching disabilities, and for their caregivers.

Conclusion

The empirical research reported here indicates that families continue to be the main providers of care for the older population all over the world. Some of the recent social developments discussed in this paper were initially assumed to have a negative effect on family care for older people; however, most of these trends will most likely result in more care for those in later life. For example, improvements in mortality mean that older people are more likely than ever to survive into old age with a spouse, who is a primary

source of support and help in later life. Moreover, despite increases in family disruptions and women's labor force participation, most studies show that receipt of support by family and friends is largely driven by need, rather than family size or competing obligations.

However, there are a number of factors which need to be taken into account when considering whether this will continue. First, the size of the population needing care will increase substantially. The continued aging of the population, even assuming falling disability rates, leads to projected increases in the number of older people with functional limitations (Jacobozone et al. 1998). Second, while it is expected that spouses and children will continue to be the main source of informal care, they too are aging. Third, increasing survival among those with relatively heavy support needs (such as those with dementia) is likely to mean that some people are too impaired (physically and/or mentally) for family care and will need very intensive support (MacDonald and Cooper 2007). Fourth, some types of professional care, such as dental care and podiatry, are needed by almost everyone whether in need of personal care or not. While this study's findings show that family support remains central, it remains unclear how these emerging trends may affect future family support.

In conclusion it can be argued that this research supports the case that family care is still the bedrock of care even when relationships become disrupted by divorce and other family changes. Questions remain as to whether this will continue with an increasingly aging population. Whether this happens or not, the case for support for family caregivers will be key in future policies.

References

- Adamchak DJ (1989) Population aging in Sub-Saharan Africa: The effects of development on the elderly. *Popul Environ* 10:162–176
- Adeokun LA (1986) Aging and the status of the elderly in Nigeria. *Gerontol* 19:82–86
- Agree EM, Biddlecom AE, Chang MC, Perez A (2002) Transfers from older parents to children in Taiwanese and Filipino families. *J Cross-Cultural Gerontol* 17:269–294
- Agree EM, Biddlecom AE, Valente TW (2005) Intergenerational transfers of resources between older persons and extended kin in Taiwan and the Philippines. *Popul Stud* 59:181–195
- Agree EM, Bissett B, Rendall MS (2003) Simultaneous care for parents and care for children among mid-life British women and men. *Popul Trends* 112:29–35
- Agree EM, Freedman VA (2000) Incorporating assistive devices into community-based long-term care: An analysis of the potential for substitution and supplementation. *J Aging Health* 12:426–450
- Agree EM, Freedman VA (2003) A comparison of assistive technology and personal care in alleviating disability and unmet need. *Gerontologist* 43:335–344
- Agree EM, Freedman VA, Cornman JC, Wolf DA, Marcotte JE (2005) Reconsidering substitution in long-term care: When does assistive technology take the place of personal care? *J Gerontol: Soc Sci* 60:S272–S280
- Agree EM, Freedman VA, Sengupta M (2004) Factors influencing the use of mobility technology in community-based long-term care. *J Aging Health* 16:267–307
- Albertini M, Kohli M, Vogel C (2007) Transfers of time and money among elderly Europeans and their children: Common patterns – different regimes? *J Eur Soc Policy* 17:319–334
- Allen I, Perkins E (1995) *The future of family care for older people*. London: HMSO
- Allen SM, Foster A, Berg K (2001) Receiving help at home: The interplay of human and technological assistance. *J Gerontol B Psychol Sci Soc Sci* 56:S374–S382
- Almond S, Bebbington AC, Judge K, Mangalore R, O'Donnell O (1998) *Poverty, disability and the use of long term care services*. Canterbury: University of Kent
- Andrews GR, Hennink MM (1992) The circumstances and contributions of older persons in three Asian countries: Preliminary results of a cross-national study. *Asia-Pacific Popul J* 7:127–146
- Aquilino WS (1994) Impact of childhood family disruption on young adults' relationships with parents. *J Marriage Fam* 56:295–313
- Arber S, Ginn J (1991) *Gender and later life: A sociological analysis of resources and constraints*. Sage Publications, London
- Arber S, Ginn J (1995) Gender differences in informal caring. *Health Soc Care Commun* 3:19–31
- Armitage B, Babb P (1996) Population review: (4) Trends in fertility. *Popul Trends* 84:7–13
- Arno PS, Levine C, Memmott MM (1999) The economic value of informal caregiving. *Health Aff* 18:182–188
- Askham J, Ferring D, Lamura G (2007) Personal relationships in later life. In: Bond J, Peace S, Dittmann-Kohli, Westerhof GJ (eds) *Ageing in society*. Sage Publications, London, pp 186–208
- Barber JS (2001) The intergenerational transmission of age at first birth among married and unmarried men and women. *Soc Sci Res* 30:219–247
- Bengtson VL, Rosenthal CJ, Burton LM (1990) Paradoxes of families and aging. In: Binstock RH, George LK (eds) *Handbook of aging and the social sciences*, 3rd edn. Academic Press, San Diego, CA, pp 263–287
- Bhakta B (2003) Below replacement fertility in East and South-east Asia: Consequences and policy responses. *J Popul Res* 20:1–18

- Biddlecom AE, Ofstedal MB, Chayovan N (2003) Intergenerational support and transfers. In AI Hermalin (ed) *The well-being of the elderly in Asia: A four-country comparative study*. University of Michigan Press, Ann Arbor, MI
- Brody EM (1981) "Women in the middle" and family help to older people. *Gerontologist* 21:471–480
- Brody EM (1985) Parent care as normative stress. *Gerontologist* 25:19–29
- Broese van Groenou MI, Glaser K, Tomassini C, Jacobs T (2006) Socio-economic status differences in the use of informal and formal help: A comparison of four European countries. *Ageing Soc* 26:745–766
- Broese van Groenou MI, van Tilburg T (2003) Network size and support in old age: Differentials by socio-economic status in childhood and adulthood. *Ageing Soc* 23:625–645
- Brookmeyer R, Gray S, Kawas C (1998) Projections of Alzheimer's disease in the United States and the public health impact of delaying disease onset. *Am J Public Health* 88:1337–1342
- Bulcroft KA, Bulcroft RA (1991) The timing of divorce, effects on parent-child relationships in later life. *Res Aging* 13:226–243
- Burton LM, Bengtson VL (1985) Black grandmothers: Issues of timing and continuity of roles. In: Bengtson VL, Robertson JF (eds) *Grandparenthood*. Sage Publications, Beverly Hills, pp 61–77
- Cafferata GL (1987) Marital status, living arrangements, and the use of health services by elderly persons. *J Gerontol* 42:613–618
- Cagney KA, Agree EM (1999) Racial differences in skilled nursing care and home health care use: The mediating effects of family structure and social class. *J Gerontol B Psychol Sci Soc Sci* 54B:S223–S236
- Cagney KA, Agree EM (2005) Racial differences in formal long-term care: Does the timing of parenthood play a role? *J Gerontol B Psychol Sci Soc Sci* 60B:S137–S145
- Campbell LD, Martin-Matthews A (2000) Caring sons: Exploring men's involvement in filial care. *Can J Aging* 19:57–79
- Campbell LD, Martin-Matthews A (2003) The gendered nature of men's filial care. *J Gerontol B-Psychol Sci Soc Sci* 58: S350–S358
- Center on an Aging Society (2005) A decade of informal caregiving: Are today's informal caregivers different than informal caregivers a decade ago? Data profile Number 1. Georgetown University, Washington DC
- Chang CF, White-Means SI (1991) The men who care: An analysis of male primary caregivers who care for frail elderly at home. *J Appl Gerontol* 10:343–358
- Chappell NL (1991) Living arrangements and sources of care giving. *J Gerontol* 46:S1–S8
- Cherlin A (1981, 1992) *Marriage, divorce and remarriage*. Harvard University Press, Cambridge
- Cherlin A (2004) The deinstitutionalization of American marriage. *J Marriage Fam* 66:848–861
- Cicirelli VG (1995) *Sibling relationships across the life span*. Plenum Press, New York
- Coleman D (2000) Population and family. In: *Twentieth-century British social trends*, Macmillan Press, London, pp 27–93
- Connidis IA (1994) Sibling support in older age. *J Gerontol: Soc Sci* 49:S309–S317
- Cooney TM, Uhlenberg P (1990) The role of divorce in men's relations with their adult children after mid-life. *J Marriage Fam* 52:677–688
- Cornman JC, Freedman VA, Agree EM (2005) Measurement of assistive device use: Implications for estimates of device use and disability in late life. *Gerontologist* 45:347–358
- Crimmins EM, Ingegneri DG (1990) Interaction and living arrangements of older parents and their children. *Res Aging* 12:3–35
- Cutler DM, Landrum MB, Stewart K (2006) Intensive medical care and cardiovascular disease disability reductions. NBER Working Paper Series No. 12184. National Bureau of Economic Research, Cambridge, MA
- Cutler DM, McClellan M (2001) Is technological change in medicine worth it? *Health Affairs*, (September/October):11–29
- Cwikela J, Gramotnevc H, Lee C (2006) Never-married childless women in Australia: Health and social circumstances in older age. *Soc Sci Med* 62:1991–2001
- Daatland SO (1990) What are families for? On family solidarity and preference for help. *Ageing Soc* 10:1–15
- Dautzenberg MGH, Diederiks JPM, Philipsen H, Stevens FCJ (1998) Women of a middle generation and parent care. *Int J Aging Human Dev* 47:241–262
- DaVanzo J, Goldscheider FK (1990) Coming home again: Returns to the parental home of young adults. *Popul Stud* 44:241–255
- de Klerk M, Huijsman R (1996) Effects of technical aids on the utilization of professional care. A study among single 75-year olds. *Tijdschr Gerontol Geriatr* 27:105–114
- De Vos S, Solís P, Montes de Oca V (2004) Receipt of assistance and extended family residence among elderly men in Mexico. *Int J Aging Human Dev* 58:1–27
- Department of Economic and Social Affairs Population Division United Nations (2005) *Living arrangements of older persons around the world*. United Nations, New York
- Dooghe G (1992) Informal caregivers of elderly people: An European review. *Ageing Soc* 12:369–380
- Doty P (1986) Family care of the elderly: The role of public policy. *Millbank Q* 64:34–75
- Dunnell K (2007) The changing demographic picture of the UK National Statistician's annual article on the population. *Popul Trends* 130:9–21
- Edelman P, Hughes S (1990) The impact of community care on provision of informal care to homebound elderly persons. *J Gerontol* 45:S74–S84
- Eggebeen DJ (1992) Family structure and intergenerational exchanges. *Res Aging* 14:427–447
- Eggebeen DJ, Uhlenberg P (1985) Changes in the organization of men's lives: 1960–1980. *Fam Relations* 34:251–257
- Ermisch J, Francesconi M, Berthoud R, Gershuny J (2000) Patterns of household and family formation. In: *Seven years in the lives of British families: Evidence on the dynamics of social change from the British Household Panel Survey*, The Policy Press, Bristol, pp 21–44
- Evandrou M, Glaser K (2002) Changing economic and social roles: The experience of four cohorts of mid-life individuals in Britain, 1985–2000. *Popul Trends* 110:19–30
- Evandrou M, Glaser K, Henz U (2002) Multiple role occupancy in midlife: Balancing work and family life in Britain. *Gerontologist* 42:781–789

- Finch J (1989) Kinship and friendship. In: Jowell R, Witherspoon S, Brook L (eds) *British social attitudes. Special international report*, Gower Publishing Company, Aldershot, pp 87–103
- Finch J (1995) Responsibilities, obligations and commitments. In: Allen I, Perkins E (eds), *The future of family care for older people*, HMSO, London, pp 51–64
- Frederick JA, Fast JE (1999) Le profil des personnes qui prodiguent des soins aux aînés Profile of persons who deliver care to the elderly. In: *Tendances sociales Canadiennes* (Catalog No. 11-008), Statistique Canada, Ottawa, Canada, pp 29–33
- Freedman VA (1996) Family structure and the risk of nursing home admission. *Gerontol: Soc Sci* 51B:S61–S69
- Freedman VA, Agree EM, Cornman JC (2006) Evaluation of new measures of assistive technology and the home environment from the 2005 pilot study of technology and aging. Report to the department of health and human service's office of the assistant secretary for planning and evaluation
- Freedman VA, Agree EM, Martin LG, Cornman JC (2006) Trends in the use of assistive technology and personal care for late-life disability, 1992–2001. *Gerontologist* 46:124–127
- Freedman VA, Aykan H, Martin LG (2001) Aggregate changes in severe cognitive impairment among older Americans: 1993 and 1998. *J Gerontol B Psychol Sci Soc Sci* 56: S100–S111
- Freedman VA, Aykan H, Martin LG (2002) Another look at aggregate changes in severe cognitive impairment: Further investigation into the cumulative effects of three survey design issues. *J Gerontol B. Psychol Sci Soc Sci* 57: S126–S131
- Freedman VA, Aykan H, Wolf DA, Marcotte JE (2004) Disability and home care dynamics among older unmarried Americans. *J Gerontol: Soc Sci* 59:S25–S33
- Freedman VA, Martin LG, Schoeni RF (2002) Recent trends in disability and functioning among older adults in the United States: A systematic review. *J Am Med Assoc* 288:3137–3146
- Freedman VA, Schoeni RF, Martin LG, Cornman JC (2007) Chronic conditions and the decline in late-life disability. *Demography* 44:459–477
- Furstenberg FF, Hoffman SD, Shrestha L (1995) The effect of divorce on intergenerational transfers: New evidence. *Demography* 32:319–333
- Garstang SV, Stitik TP (2006) Osteoarthritis: Epidemiology, risk factors, and pathophysiology. *Am J Phys Med Rehabil* 85: S2–S11
- Gitlin LN (1995) Why older people accept or reject assistive technology. *Generations* 19:41–47
- Gitlin LN, Schemm RL, Landsberg L, Burgh D (1996) Factors predicting assistive device use in the home by older people following rehabilitation. *J Aging Health* 8:554–575
- Glaser K, Evandrou M, Tomassini C (2005) The health consequences of multiple roles at older ages in the UK. *Health Soc Care Commun* 13:470–477
- Glaser K, Evandrou M, Tomassini C (2006) Multiple role occupancy and social participation among midlife wives and husbands in the United Kingdom. *Int J Aging Hum Dev* 63:27–47
- Glaser K, Hancock R, Stuchbury R (1998) Attitudes in an ageing society (Research sponsored by Age Concern England for the Millennium Debate of the Age). Age Concern Institute of Gerontology, London
- Glaser K, Stuchbury R, Tomassini C, Askham J (2008) The long-term consequences of partnership disruption for support in later life in the UK. *Ageing Soc* 28:329–351
- Glaser K, Tomassini C (2000) Proximity of older women to their children: A comparison of Britain and Italy. *The Gerontologist* 40:729–737
- Gold D (1996) Continuities and discontinuities in sibling relationships across the life span. In: Bengtson VL, Neugarten B (eds) *Adulthood and aging: Research on continuities and discontinuities*, Springer Publishing Company, New York, pp 228–245
- Grundy E (1999) Intergenerational perspectives on family and household change in mid- and later life in England and Wales. In: McRae S (ed) *Changing Britain. Families and households in the 1990s*, Oxford University Press, Oxford, pp 201–228
- Grundy E, Jitlal M (2007) Socio-demographic variations in moves to institutional care 1991–2001: A record linkage study from England and Wales. *Age Ageing* 36:1–7
- Grundy E, Shelton N (2001) Contact between adult children and their parents in Great Britain 1986–1999. *Environ Plan A* 33:685–697
- Hank K (2007) Proximity and contacts between older parents and their children: A European comparison. *J Marriage Fam* 69:157–173
- Hartke RJ, Prohaska TR, Furner SE (1998) Older adults and assistive devices: Use, multiple-device use, and need. *J Aging Health* 10:99–116
- Hatch LR (1991) Informal support patterns of older African-American and White women: Examining effects of family, paid work and religious participation. *Res Aging* 13:144–170
- Henz U (2004) The effects of informal care on paid work participation in Great Britain: A lifecourse perspective. *Ageing Soc* 24:851–880
- Henz U (2006) Informal caregiving at working age: effects of job characteristics and family configuration. *J Marriage Fam* 68:411–429
- Hermalin AI, Ofstedal MB, Chang MC (1992) Types of support for the aged and their providers in Taiwan. In: Hareven TK (ed) *Aging and generational relations: Life-course and cross-cultural perspectives*, Aldine DeGruyter, New York, pp 179–215
- Himes CL (1994) Parental caregiving by adult women: A demographic perspective. *Res Aging* 16:191–211
- Hirst M (2001) Trends in informal care in Great Britain during the 1990s. *Health Soc Care Community* 9:348–357
- Hoenig H, Taylor DH, Sloan FA (2003) Does assistive technology substitute for personal assistance among the disabled elderly? *Am J Public Health* 93:330–337
- Houde SC (1998) Predictors of elders' and family caregivers' use of formal home services. *Res Nurs Health* 21:533–543
- Hussein S, Manthorpe J (2005) An international review of the long-term care workforce: Policies and shortages. *J Aging Soc Policy* 17:75–94
- Jacobozone S, Cambois E, Chaplain E, Robine JM (1998) The health of older persons in OECD countries: Is it improving fast enough to compensate for population ageing? OECD, Paris
- Jarvis C, Stuchbury R, Hancock R (1998) Millennium debate of the age: The ONS Omnibus Survey

- Jette AM, Tennstedt SL, Branch LG (1992) Stability of informal long-term care. *J Aging Health* 4:193–211
- Kalmijn M (2007) Gender differences in the effects of divorce, widowhood, and remarriage on intergenerational support: Does marriage protect fathers? *Soc Forces* 85:1079–1104
- Kasper JD, Shore A, Penninx A, BW (2000) Caregiving arrangements of older disabled women, caregiving preferences, and views on adequacy of care. *Aging (Milano)*, 12:141–153
- Kelly S, Baker K (2000) Healthy life expectancy in Great Britain, 1980–1996, and its use as an indicator in United Kingdom Government Statistics. *Health Stat Q* 7:32–37
- Kelman HR, Thomas C, Tanaka JS (1994) Longitudinal patterns of formal and informal social support in an urban elderly population. *Soc Sci Med* 38:905–914
- Kemper P (1992) The use of formal and informal home care by the disabled elderly. *Health Serv Res* 27:421–451
- Kinsella K, Velkoff VA (2001) *An aging world: 2001*. U.S. Government Printing Office, Washington, DC
- Klinger L, Spaulding SJ (2001) Occupational therapy treatment of chronic pain and use of assistive devices in older adults. *Top Geriatr Rehabil* 16:34–44
- Knapp M, Prince M, Albanese E, Banerjee S, Dhanasiri S, Fernandez JL, et al. (2007) *Dementia*, Alzheimer's Society, UK, London
- Knodel J (2006) Parents of persons with AIDS: Unrecognized contributions and unmet needs. *Global Ageing: Issues Action (August)*:46–55
- Knodel J, Chayovan N (1997) Family support and living arrangements of Thai elderly. *Asia-Pacific Popul J* 12:51–68
- Knodel J, Chayovan N, Siriboon S (1992) The impact of fertility decline on familial support for the elderly: An illustration from Thailand. *Popul Dev Rev* 18:79–103
- Knodel J, Ofstedal MB (2003) Gender and aging in the developing world: Where are the men? *Popul Dev Rev* 29:677–698
- Konetzka RT, Stearns SC, Konrand TR, Magaziner J, Zimmerman S (2005) Personal care aide turnover in residential care settings: An assessment of ownership, economic, and environmental factors. *J Appl Gerontol* 24:87–107
- Koropecykj-Cox T, Vaughn RAC (2007) Characteristics of older childless persons and parents: Cross-national comparisons. *J Family Issues* 28:1362–1414
- Kramarow EA, Liblitz J, Lentzner H (2007) Trends in the health of older Americans 1970–2005. *Health Aff* 25:1417–1425
- Kunst AE, Bos V, Lahelma E, Bartley M, Lissau I, Regidor E, et al. (2005) Trends in socioeconomic inequalities in self-assessed health in 10 European countries. *Int J Epidemiol* 34: 295–305
- La Plante MP, Hendershot GE, Moss AJ (1992) Assistive technology devices and home accessibility features: Prevalence, payment, need, and trends. *Advance data from vital and health statistics*, no 217, National Center for Health Statistics, Hyattsville, Maryland
- Larsson K, Silverstein M (2004) The effects of marital and parental status on informal support and service utilization: A study of older Swedes living alone. *J Aging Stud* 18:231–244
- Lee GR, Dwyer JW, Coward RJ (1990) Residential location and proximity to children among impaired older parents. *Rural Sociol* 55:579–589
- Liesbeth S, Liefbroer AC (2008) Intergenerational transmission of age at first birth in the Netherlands for birth cohorts born between 1935 and 1984: Evidence from municipal registers. *Popul Stud* 62:69–84
- Lilja M, Bergh A, Johansson L, Nygard L (2003) Attitudes towards rehabilitation needs and support from assistive technology and the social environment among elderly people with disability. *Occup Ther Int* 10:75–93
- Lin G, Rogerson PA (1995) Elderly parents and the geographic availability of their adult children. *Res Aging* 17:303–331
- Litwak E, Kulis S (1987) Technology, proximity, and measures of kin support. *J Marriage Fam* 49:649–661
- Liu K, Manton KG, Aragon C (2000) Changes in home care use by disabled elderly persons: 1982–1994. *J Gerontol. B Psychol Sci Soc Sci* 55:S245–S253
- Lowenstein A, Daatland, SO (2006) Filial norms and family support in a comparative cross-national context: Evidence from the OASIS study. *Ageing Soc* 26:203–223
- Lye DN, Klepinger DH, Hyle PD, Nelson A (1995) Childhood living arrangements and adult children's relations with their parents. *Demography* 32:261–280
- MacDonald A, Cooper B (2007) Long-term care and dementia services: An impending crisis. *Age Ageing* 36:16–22
- Macunovich DJ, Easterlin RA, Schaeffer CM, Crimmins EM (1995) Echoes of the baby boom and bust: Recent and prospective changes in living alone among elderly widows in the United States. *Demography* 32:17–28
- Mann WC, Goodall S, Justiss MD, Tomita M (2002) Dissatisfaction and nonuse of assistive devices among frail elders. *Assistive Technol* 14:130–139
- Mann WC, Krauz J, Hurren D, Tomita M (1992) Assistive devices for home-based elderly and persons with cognitive impairments. *Top Geriatr Rehabil* 8:35–52
- Mann WC, Ottenbacher KJ, Fraas L, Tomita M, Granger CV (1999) Effectiveness of assistive technology and environmental interventions in maintaining independence and reducing home care costs for the frail elderly. *Arch Fam Med* 8:210–217
- Manton KG, Corder L, Stallard E (1993) Changes in the use of personal assistance and special equipment from 1982 to 1989: Results from the 1982 and 1989 NLTCs. *Gerontologist* 33:168–176
- Manton KG, Gu X, Lamb VL (2006) Change in chronic disability from 1982 to 2004–2005 as measured by long-term changes in function and health in the U.S. elderly population. *PNAS* 103:18374–18379
- Manton KG, Gu X, Ukraintseva SV (2005) Declining prevalence of dementia in the U.S. elderly population. *Adv Gerontol Res* 16:30–37
- Mason K (1992) Family change and support of the elderly in Asia: What do we know? *Asia-Pacific Popul J* 7:13–32
- Matthews SH, Rosner T (1988) Shared filial responsibility: The family as the primary caregiver. *J Marriage Fam* 50:185–195
- Matthews SH, Heidorn J (1998) Meeting filial responsibilities in brothers-only sibling groups. *J Gerontol: Soc Sci* 53B: S278–S286
- McAuley WJ, Blieszner R (1985) Selection of long-term care arrangements by older community residents. *Gerontologist* 25:188–193
- Merli MG, Palloni A (2006) The HIV/AIDS epidemic, kin relations, living arrangements and the African elderly in South Africa. In: Cohen B, Menken J (eds) *Aging in sub-saharan africa: Recommendations for furthering research*, National Academies Press, Washington, DC, pp 117–165
- Miller B (1991) Elderly married couples, gender, and caregiver strain. *Adv Med Sociol* 2:245–266

- Miller B, McFall S (1991) Stability and change in the informal task support network of frail older persons. *Gerontologist* 31:735–745
- Miller B, McFall S, Campbell R (1994) Changes in sources of community long-term care among African American and white frail older persons. *J Gerontol* 49:S14–S24
- Miner S, Uhlenberg P (2004) Intragenerational proximity and the social role of sibling neighbours after midlife. *Fam Relations* 46:145–153
- Moen P, Robison J, Fields V (1994) Womens work and caregiving roles – A life-course approach. *J Gerontol* 49: S176–S186
- Motel-Klingebiel A (2003) Intergenerational support for the elderly and the welfare state - a comparative perspective on families and social policies. Paper presented at the Network for European Social Policy Analysis (ESPAnet) conference: Changing European Societies – The Role for Social Policy, 13–15 November, Copenhagen, Denmark
- Murphy M, Grundy E (2003) Mothers with living children and children with living mothers: The role of fertility and mortality in the period 1911–2050. *Popul Trends* 112:36–44
- Mutchler JE (1992) Living arrangements and household transitions among the unmarried in later life. *Soc Sci Q* 73:565–580
- Nihtilä E, Martikainen P (2008) Why older people living with a spouse are less likely to be institutionalized: The role of socioeconomic factors and health characteristics. *Scand J Public Health* 36:35–43
- Nochajski S, Tomita M, Mann WC (1996) Use and satisfaction with assistive devices by older persons with cognitive impairments: a pilot intervention study. *Top Geriatr Rehabil* 12:40–53
- Noelker LS, Bass, DM (1989) Home care for elderly persons: Linkages between formal and informal caregivers. *J Gerontol* 44:S63–S70
- OECD (2005) Long-term care for older people. Paris: OECD Publishing
- OECD (2007) Trends in severe disability among elderly people: Assessing the evidence in 12 OECD countries and the future implications prepared by Gaétan Lafortune, Gaëlle Balestat, and the Disability Study Expert Group Members. Paris: OECD Health Working Paper #26, OECD (DELSA/HEA/WD/HWP/2007)
- Olshansky SJ, Passaro D, Hershov R (2005) A potential decline in life expectancy in the United States in the 21st century. *New Eng J Med* 352:1138–1145
- Palloni A (2001) Living arrangements of older persons. In United Nations (ed) Living arrangements of older persons: Critical issues and policy responses. *Population Bulletin of the United Nations, Special Issue Nos. 42/43*, United Nations, New York, pp 54–110
- Palloni A, DeVos S, Pelaez M (2002) Aging in Latin America and the Caribbean (CDE Working Paper No. 99-02). University of Wisconsin, Madison
- Peek CW, Zsembik BA, Coward RT (1997) The changing caregiving networks of older adults. *Res Aging* 19:333–361
- Pezzin LE, Schone BS (1999) Parental marital disruption and intergenerational transfers: An analysis of lone elderly parents and their children. *Demography* 36:287–297
- Pickard L, Wittenberg R, Comas-Herrera A, Davies B, Darton R (2000) Relying on informal care in the new century? Informal care for elderly people in England to 2031. *Ageing Soc* 20:745–772
- Preston SH (2005) Deadweight? The influence of obesity on longevity. *New Eng J Med* 352:1135–1137
- Redfoot DL, Pandya SM (2002) Before the boom: Trends in long-term supportive services for older Americans with disabilities. Washington, D.C.: The AARP Public Policy Institute
- Reynolds SL, Saito Y, Crimmins EM (2005) The impact of obesity on active life expectancy in older American men and women. *Gerontologist* 45:438–444
- Roan CL, Raley RK (1996) Intergenerational coresidence and contact: A longitudinal analysis of adult children's response to their mother's widowhood. *J Marriage Fam* 58:708–717
- Robine JM, Romieu I, Cambois E (1999) Health expectancy indicators. *Bull World Health Org* 77:181–185
- Robison J, Moen P, Dempster-McClain D (1995) Women's caregiving: Changing profiles and pathways. *J Gerontol: Soc Sci* 50B, S362–S373
- Rogerson PA, Weng RH, Lin G (1993) The spatial separation of parents and their adult children. *Ann Assoc Am Geogr* 83:656–671
- Rosenthal CJ (2000) Aging families: Have current changes and challenges been “oversold”? In: Gee EM, Gutman GM (eds) *The overselling of population aging: Apocalyptic demography, intergenerational challenges, and social policy*. Oxford University Press, Toronto, pp 45–63
- Rosenthal CJ, Martin-Matthews A, Matthews SH (1996) Caught in the middle? Occupancy in multiple roles and help to parents in a national probability sample of Canadian adults. *J Gerontol: Soc Sci* 51B:S274–S283
- Rosenthal CJ, Matthews SH, Marshall VW (1989) Is parent care normative? The experiences of a sample of middle-aged women. *Res Aging* 11:244–260
- Russell JN, Hendershot GE, LeClerc F, Howie J, Adler M (1997) Trends and differential use of assistive technology devices: United States, 1994. In: *Advance data from vital and health statistics*, vol. 292. National Center for Health Statistics, Hyattsville, Maryland, pp 1–12
- Russell R (2007) The work of elderly men caregivers: From public careers to an unseen world. *Men Masculinities* 9:298–314
- Saad PM (2003) Transferencias informales de apoyo de los adultos mayores en América Latina y el Caribe: Estudio comparativo de encuestas SABE. *Notas de Población, CELADE, Chile* 30:175–218
- Safilios-Rothschild C (1989) Theoretical aspects of the family systems of the less and more industrialised countries : Are all family systems converging? Paper presented at the International Population Conference/Congress International de la Population, New Delhi International Union for the Scientific Study of Population. Liege, Belgium, pp 119–127
- Schoeni RF, Freedman VA, Martin LG (2008) Why is late-life disability declining? *Milbank Q* 86:47–89
- Schoeni RF, Freedman VA, Wallace RB (2001) Persistent, consistent, widespread, and robust? Another look at recent trends in old-age disability. *J Gerontol: Soc Sci* 56B:S206–S218
- Seltzer MM, Li LW (2000) The dynamics of caregiving: transitions during a three-year prospective study. *Gerontologist* 40:165–178
- Shanas E (1979) Social myth as hypothesis: The case of the family relations of old people. *Gerontologist* 19:3–9

- Shapiro A (2003) Later-life divorce and parent-adult child contact and proximity. *J Family Issues* 24:264–285
- Shea D, Davey A, Femia EE, Zarit S, Sundström G, Berg S, et al. (2003) Exploring assistance in Sweden and the United States. *Gerontologist* 43:712–721
- Shelton N, Grundy E (2000) Proximity of adult children to their parents in Great Britain. *Int J Popul Geogr* 6:181–195
- Shrestha LB (2000) Population ageing in developing countries. *Health Aff* 12:204–212
- Silverstein M (1995) Stability and change in temporal distance between the elderly and their children. *Demography* 32:29–45
- Sobotka T (2004) Is lowest-low fertility in Europe explained by the postponement of childbearing? *Popul Dev Rev* 30:195–220
- Sobotka T, Testa MR (Forthcoming) Childlessness attitudes and intentions in Europe. In: Höhn C, Avramov D, Kotowska I (eds) *People, population change and policies: Lessons from the population policy acceptance study*, vol. 16/1, *European Studies of Population*
- Soldo BJ (1996) Cross pressures on middle-aged adults: A broader view. *J Gerontol: Soc Sci* 51B, S271–S273
- Soldo BJ, Hill MS (1995) Family structure and transfer measures in the health and retirement study – Background and overview. *J Hum Res* 30:S108–S137
- Soldo BJ, Wolf DA, Agree EM (1990) Family, households, and care arrangements of frail older women: A structural analysis. *J Gerontol: Soc Sci* 45:S238–S249
- Spieß CK, Schneider U (2003) Interactions between care-giving and paid work hours among European midlife women, 1994 to 1996. *Ageing Soc* 23:41–68
- Spillman BC (2004) Changes in elderly disability rates and the implications for health care utilization and cost. *Milbank Q* 82:157–194
- Spillman BC, Black KJ (2005) Staying the course: Trends in family caregiving, AARP Policy Paper #2005-17. AARP, Washington DC
- Spillman BC, Pezzin LE (2000) Potential and active family caregivers: Changing networks and the “sandwich generation” *Milbank Q* 78:347–374
- Spitze G, Logan J (1990) More evidence on women (and men) in the middle. *Res Aging* 12:182–198
- Stevenson B, Wolfers J (2007) Marriage and divorce: Changes and their driving forces. *J Econ Perspect* 21:27–52
- Stoller EP (1990) Males as helpers: The role of sons, relatives and friends. *Gerontologist* 30:228–235
- Stoller EP, Cutler SJ (1993) Predictors of use of paid help among older people living in the community. *Gerontologist* 33:31–40
- Stone R (2001) Long term care workforce shortages: impact on families (Policy Brief No. 3 Who will provide care: emerging issues for state policymakers). Washington D.C.: Family Caregiver Alliance
- Stone R, Cafferata GL, Sangl J (1987) Caregivers of the frail elderly: A national profile. *Gerontologist* 27:616–626
- Sundström G (1994) Care by families: An overview of trends. In OECD (ed) *Caring for frail elderly people. New directions in care* (Vol. 14, pp 15–55). Paris: OECD Social Policy Studies
- Sundström G, Johansson L, Hassing LB (2002) The shifting balance of long-term care in Sweden. *Gerontologist* 42:350–355
- Taylor DH, Hoenig H (2004) The effect of equipment usage and residual task difficulty on use of personal assistance, days in bed, and nursing home placement. *J Am Geriatric Soc* 52:72–79
- Tennstedt SL, Chang BH (1998) The relative contribution of ethnicity versus socioeconomic status in explaining differences in disability and receipt of informal care. *J Gerontol B Psychol Sci Soc Sci* 53:S61–S70
- Tennstedt SL, Crawford SL, McKinlay JB (1993) Is family care on the decline? A longitudinal investigation of the substitution of formal long-term care services for informal care. *Milbank Q* 71:601–624
- Testa MR, Grilli L (2006) The influence of childbearing regional contexts on ideal family size in Europe. *Population*, 61:107–138
- Thornton A, Young-DeMarco L (2001) Four decades of trends in attitudes toward family issues in the United States. *J Marriage Fam* 63:1009–1037
- Tomassini C, Glaser K, Wolf DA, Broese van Groenou MI, Grundy E (2004) Living arrangements among older people: An overview of trends in Europe and the USA. *Popul Trends* 115:24–34
- Tomassini C, Wolf DA (2000a) Shrinking kin networks in Italy due to sustained low fertility. *Eur J Popul Stud* 16:353–372
- Tomassini C, Wolf DA (2000b) Stability and change in the living arrangements of older Italian women: 1990–1995. *Genus*, LVI:203–219
- Tomita MR, Mann WC, Fraus LF, Stanton KM (2004) Predictors of the use of assistive devices that address physical impairments among community-based elders. *J Appl Gerontol* 23:141–155
- U.S. Bureau of the Census (1975) *Historical statistics of the U. S. Colonial times to 1970 (Part 1)*. Washington DC: U. S. Government Printing Office
- van der Geest S, Mul A, Vermeulen H (2004) Linkages between migration and the care of frail older people: Observations from Greece, Ghana and The Netherlands. *Ageing Soc* 24:431–450
- van der Heide A, Jacobs JW, van Albada-Kuipers GA, Kraaimaat FW, Geenen R, Bijlsma JW (1993) Self report functional disability scores and the use of devices: Two distinct aspects of physical function in rheumatoid arthritis. *Ann Rheum Dis* 52:497–502
- Velkoff VA, Kowal PR (2007) *Population ageing in Sub-Saharan Africa: Demographic dimensions 2006*. Washington, DC: Current Population Reports, P95/07-1. U.S. Census Bureau
- Verbrugge LM, Rennert C, Madans J (1997) The great efficacy of personal and equipment assistance in reducing disability. *Am J Public Health* 87:384–392
- Verbrugge LM, Sevak P (2002) Use, type, and efficacy of assistance for disability. *J Gerontol B Psychol Sci Soc Sci* 57: S366–S379
- Wachter KW (1997) Kinship resources for the elderly. *Philos Trans R Soc Lond: B Biol Sci* 352:1811–1817
- Waidmann TA, Manton KG (1998) International evidence on disability trends among the elderly. The Urban Institute, Washington, DC
- Walker A, Maltby T (1997) *Ageing Europe*. Buckingham: Open University Press

- Werner B (1988) Fertility trends in the UK and in thirteen other developed countries, 1966–1986. *Popul Trends* 51:18–24
- White L (1994) Coresidence and leaving home: Young adults and their parents. *Ann Rev Sociol* 20:81–102
- Wolf DA (1994) The elderly and their kin: Patterns of availability and access. In: LG Martin, SH Preston (eds), *Demography of aging*, Academy Press, Washington DC, pp 146–194
- Wolf DA (1995) Changes in the living arrangements of older women: an international study. *Gerontologist* 35:724–731
- Wolf DA, Longino C (2005) Our “increasingly mobile society”? The curious persistence of a false belief. *Gerontologist* 45:5–11
- Wolff JL, Kasper JD (2006) Caregivers of frail elders: Updating a national profile. *Gerontologist* 46:344–356
- Yang JJ, Mann WC, Nochajski S (1997) Use of assistive devices among elders with cognitive impairment: a follow-up study. *Top Geriatr Rehabil* 13:13–31
- Zimmer Z, Chappell NL (1994) Mobility restriction and the use of devices among seniors. *J Aging Health* 6:185–208

Part VII
Population Aging and Social
Relationships

Chapter 30

Childless Old Age

Pearl A. Dykstra

Introduction

This chapter presents trends in childlessness over the course of the twentieth century. It also provides a review of the antecedents and consequences of childlessness among older adults. Childlessness has only recently started to figure prominently on the research agenda of the social sciences. Previously, it was studied tangentially, or not at all.

Demographers have focused on mean levels of fertility, the age at childbearing, marital and non-marital fertility and intergenerational co-residence. Given these substantive foci, childlessness has remained a hidden issue. Sociologists with an interest in parenthood have largely restricted their research to active phases of childbearing. Analyses have involved comparisons of those who do and those who do not have dependent children. In such designs, the childless end up in the same category as empty-nesters, making it impossible to disentangle the effects of parenthood (i.e., having children) and parenting (i.e., caring for children). The never married also disappear from sight.

Throughout the review I will highlight the ways in which knowledge about childlessness in late life has remained limited because of the kinds of research questions that were asked. It will become evident that

research on childless older adults has suffered from historical myopia, a neglect of men and a disregard for the diversity among the childless.

Trends in Childlessness

Data Sources

Statistics on childlessness in older cohorts are not easily compiled. The data have gaps, show inconsistencies, are not always comparable across time and across countries and must be sought in a wide range of sources. Generally, data are available for women only (Coleman 2000; Forste 2002; Greene and Biddlecom 2000). Three kinds of data sources exist.

Historical censuses are one source but the information they yield on childlessness tends to be incomplete. Difficulties arise from the kinds of questions that were asked. Questions pertained, for example, to the number of children in the household, reflecting the early census-takers' interest in housing and household composition rather than fertility. Children living "beyond the household" (Van Baelen and Matthijs 2007) and deceased children remain out of sight. Alternatively, census questions were about the number of children born in the current marriage or questions on childbearing were only put to ever-married women. As a result, information on fertility in previous marriages and on non-marital childbearing is lacking. To arrive at data on the total proportion childless, estimates of non-marital births and of births in previous marriages need to be made (Dorbritz 2005; Rowland 2007; Sobotka 2004). Item non-response is another source of uncer-

P. A. Dykstra
Department of Social Demography
Netherlands Interdisciplinary Demographic Institute
Lange Houtstraat 19
2511 CV The Hague
The Netherlands
E-mail: dykstra@nidi.nl

tainty. Estimates of childlessness can differ considerably depending on how the “not stateds” are treated (Merlo and Rowland 2000): assigned to the childless category, omitted or distributed among categories of family size.

Large-scale sample surveys conducted among contemporary older adult populations are a second source of information. Sample selectivity is a drawback here. Information on those who have not survived to old age is lacking (and they tend to belong to low socioeconomic status groups (Smith et al. 1994)), as is information on those who left the country. These forms of selectivity apply to censuses as well but less strongly so. In addition, of course, there is the problem of non-response, which should be taken seriously because it tends to be selective with respect to determinants of childlessness. In surveys, the likelihood of being reached is lower for those who live alone than for those who live in a multi-person household (Stoop 2005). A considerable proportion of older adults who live alone are childless because they never married or divorced at an early age and did not remarry. The survey sample frame might also introduce biases by, for example, excluding residents of care facilities. Older adults without children are generally over-represented in institutional care (Koropecj-Cox and Call 2007), resulting in an underestimate of childlessness in older cohorts if no adjustments for the sample frame are made. Another drawback of many existing surveys is that information is collected on the number of living children and not on the number of children ever born (Dykstra and Hagestad 2007b). Inquiries into the number of living children are typical of gerontological research with its strong focus on the sources of support available to older adults. From such a perspective, there is no need to have information on whether older adults have outlived their children.

Vital registrations are a third source of information. Unfortunately, data on pre-1930 cohorts in Europe tend to be unavailable. Another problem is that a number of European countries routinely collect data on births in marriage only (Belgium, France, Germany, Switzerland and the United Kingdom). A problem specific to the U.S. is that prior to 1935, vital registrations did not cover all the states and the registration of births in participating states was not always complete (Whelpton 1938).

Childlessness Across the Twentieth Century

Rowland (2007) provided the most comprehensive overview to date on rates of childlessness over time. His work forms the basis for Table 30.1. I have expanded on his work by, where possible, (a) including more recent cohorts (1955–1959 and 1960–1964) to provide an indication of childlessness rates among older adults of the future, (b) substituting his figures with ones from more recent sources and (c) incorporating data from East European and Balkan countries. The table presents percentages of childless women at age 45 for five-year birth cohorts. In some countries the data refer to years ending in 1 or 6 or to years ending in 2 or 7 but for the sake of simplicity these are grouped under the closest interval for years ending in 0 and 5.

The childlessness rates show a U-shaped pattern across birth cohorts: high levels of childlessness among women born between 1900 and 1910, declining levels in the 1910 to 1930 cohorts, the lowest levels of childlessness among women born in the 1930s and 1940s and increasing levels childlessness among women born in 1950 and after. Note that, among current older adults, e.g., those born between 1920 and 1940, the proportion childless is the lowest ever recorded. The U-shaped pattern is strikingly similar across the countries for which the relevant data exist, though absolute childlessness rates differ. Among women born between 1900 and 1910, childlessness rates over 20 per cent are not uncommon. Childlessness rates in the youngest cohorts do not reach that level, with the exception of England and Wales, Western Germany and Switzerland.

Though the increasing childlessness rates of the last decades give rise to much debate, Table 30.1 shows that current levels are not without historical precedent and are generally below rates recorded for cohorts born at the beginning of the twentieth century. Furthermore, childlessness rates are not increasing everywhere. In Denmark and Norway the childlessness percentages in the youngest cohorts hover between 10 and 12 and in East European and Balkan countries they are below 10 (with the exception of Bosnia and Herzegovina). The latter also holds for Portugal. In the United States, childlessness rates are declining rather than increasing in the youngest cohorts. Abma and Martinez (2006) attributed this recent decline in childlessness to improved oppor-

Table 30.1 Percentages of all women childless by age 45, 1900–1964 birth cohorts

	1900 – 1904	1905 – 1909	1910 – 1914	1915 – 1919	1920 – 1924	1925 – 1929	1930 – 1934	1935 – 1939	1940 – 1944	1945 – 1949	1950 – 1954	1955 – 1959	1960 – 1964
<i>Northern Europe</i>													
Denmark										9	11	10 ^a	11 ^a
Finland		26	22	20	18	16	16	15	14	14	15		19 ^b
Norway		12 ^c		10 ^c		10 ^c		10 ^a	9 ^a	9 ^a	11 ^a	12 ^a	12 ^a
Sweden							14	13	13	13	14 ^a	15 ^a	16 ^a
<i>Western Europe</i>													
Austria	27 ^d	23 ^d	20 ^d	18 ^d	18 ^d	16 ^d	13 ^d	12 ^d	12 ^d	13 ^d	14 ^d	15 ^d	16 ^d
Belgium		16 ^e	14 ^e	13 ^e	12 ^e		16	14	13	13	14		
England and Wales					21	17	14	13	12	10	14	17 ^a	21 ^a
France	25	23	21	20	19	16	13	12 ^f	11 ^f	11 ^f	13 ^f		
Germany [former F.R.]	26	22	19	18	17		10	10	12	14	18	22 ^g	24 ^g
Ireland									19	15	13		17 ^b
Netherlands	23	22	20	16	15	14	12	12	12	11	15	17 ^g	18 ^g
Switzerland	22 ^c		20 ^c					15 ^g	16 ^g	18 ^g	21 ^g	24 ^g	27 ^g
<i>Southern Europe</i>													
Greece									14 ^a	12 ^a	9 ^a	11 ^a	15 ^a
Italy	18	19	17	15	16	15	13	10	14	12	12	14 ^a	18 ^a
Portugal	21	21	20	19	17	17	14			11	10		5 ^a
Spain	14	14	14	13	14				12	11	10	9 ^a	12 ^a
<i>Eastern Europe</i>													
Bulgaria			7 ^b	6 ^b	5 ^b	4 ^b	7 ^a	5 ^a	4 ^a	4 ^a	4 ^a	4 ^a	5 ^a
Czechoslovakia [former]			13	12	10				8	9	8	8 ^{ah}	8 ^{ah}
Germany [former D.R.]	26	20	17	17	18		11	10	9	8	7	8 ^g	9 ^g
Hungary	20	20	20	19	16	14	11	9	9	9	9	7 ^a	8 ^a
Poland	12 ^c	11 ^c	10 ^c	9 ^c	7 ^c								13 ^g
Romania			21	20	19	16	13			7 ^a	8 ^a	9 ^a	10 ^a
<i>Balkan countries</i>													
Bosnia and Herzegovina							13 ^a	13 ^a	14 ^a	13 ^a	14 ^a	16 ^a	
Croatia							13 ^a	12 ^a	10 ^a	11 ^a	9 ^a	8 ^a	7 ^a
Macedonia							5 ^a	6 ^a	5 ^a	5 ^a	8 ^a	8 ^a	6 ^a
Slovenia							13 ^a	11 ^a	7 ^a	8 ^a	4 ^a	3 ^a	6 ^a
Serbia and Montenegro								8 ^g	5 ^g	5 ^g	3 ^g	3 ^g	4 ^g
Yugoslavia [F.R.]							11 ^a	8 ^a	5 ^a	7 ^a	4 ^a	5 ^a	5 ^a
Yugoslavia [former]	17	15	16	15	15	13	12		9	9	8		
<i>Non-European countries</i>													
Australia	31	27	21	19	15	11	9	9	9	10 ⁱ	13 ⁱ	13 ⁱ	16 ⁱ

Table 30.1 (continued)

	1900 – 1904	1905 – 1909	1910 – 1914	1915 – 1919	1920 – 1924	1925 – 1929	1930 – 1934	1935 – 1939	1940 – 1944	1945 – 1949	1950 – 1954	1955 – 1959	1960 – 1964
Canada	22 ^j	22 ^j	20 ^j	17 ^j	15 ^j	13 ^j	13 ^j	12 ^j	14 ^j	16 ^j	14 ^j	16 ^j	
Israel			9 ^e	7 ^e	5 ^e	4 ^e	3 ^e						
Japan	9 ^e	9 ^e	8 ^e	8 ^e	8 ^e								
New Zealand	14 ^e	14 ^e	18	15	13	11	9	9	9	10			
United States	24	24	25	22	17	14	13	10	9	11	17	16 ^a	15 ^a

Note: The figures are from Rowland (2007), unless specified otherwise.

^a Averages from single year figures in Frejka and Sardon (2004).

^b Averages from single year figures in Sardon (2006).

^c Currently married women, births from the existing marriage.

^d Averages from single year figures in Wilson (2007).

^e Ever-married women.

^f Köppen, Mazuy and Toulemon (2007).

^g Averages from single year figures in Dorbritz (2005).

^h Averages from single year figures for the Czech Republic and the Slovak Republic taken together.

ⁱ Figures for women aged 40–44 in Pink (2007).

^j Figures compiled by Lapierre-Adamcyk on the basis of the 1991 Canadian census and the 2001 General Social Survey Canada.

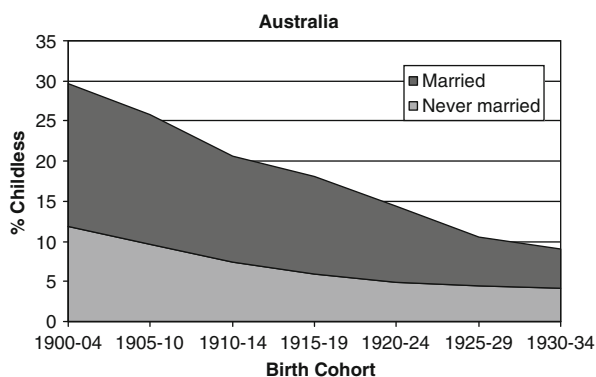
tunities to combine work and family responsibilities. According to Sobotka (2004), the decline in childlessness in the United States might be a compositional effect: an increasing proportion of non-white women (who tend to have lower childlessness rates) in the younger population. He cautioned, however, that the decline might be an artifact, created by inaccurate fertility data.

Marital and Non-Marital Childlessness

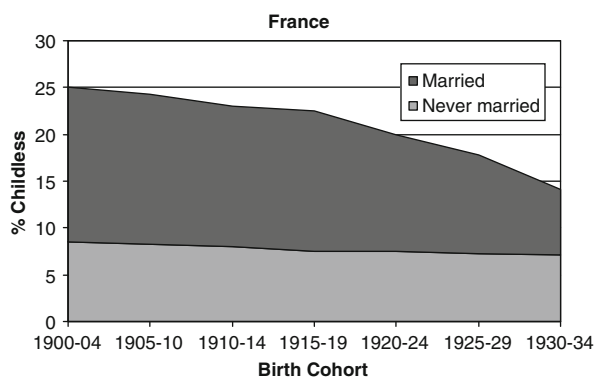
Figure 30.1 shows a decomposition by marital status of childlessness rates in the 1900–1930 birth cohorts for Australia, France, The Netherlands and the United States (to my knowledge, comparable data for other countries have not been published). In three of the four countries, the high levels of childlessness in the earliest twentieth century cohorts are primarily due to childlessness within marriage rather than never marrying. In The Netherlands, the relatively high proportion of never-married women accounts for high childlessness levels. The exceptional position of The Netherlands in terms of fertility patterns has been described elsewhere (Frejka and Sardon 2004). Throughout the nineteenth century and up to the 1970s Dutch family sizes were larger than in other countries and women had their children at relatively advanced ages. Figure 1 also shows that much of the decline in childlessness

rates is attributable to declines in marital childlessness (again The Netherlands is an exception). Reductions in the proportions never-married among the childless are especially apparent in Australia and The Netherlands.

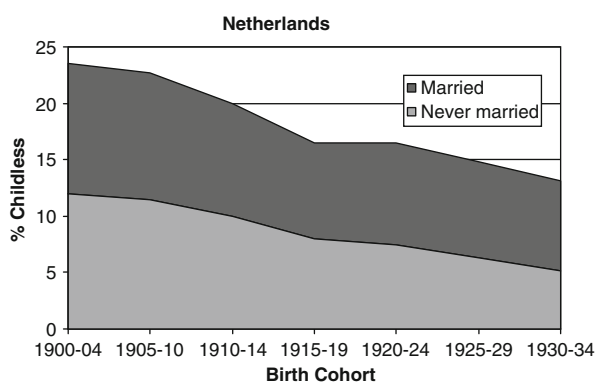
The aggregate data on marital childlessness pertain to the ever-married. A disaggregation of antecedents of childlessness such as late marriage, early divorce and early widowhood is not possible. Such analyses require individual level data on pathways to childlessness (Hagestad and Call 2007) and those kinds of data are scarce for early twentieth century cohorts. Men and women born around the turn of the twentieth century were subjected to what Hareven (1982) called “grand historical events” (p. 8), which influenced their opportunities for marriage and the stability of their marriages. Marriage dissolutions by the death of one of the partners soared in 1918 as the result of the influenza epidemic and divorce rates peaked at the end of the First and Second World Wars (Ekamper et al. 2003; Jacobson 1950). The high number of male casualties suffered during the First World War left Great Britain with an unmarried generation known as the “surplus women” (Nicholson 2007). The impact of historical context is evident in the high proportion of childlessness in West Berlin. According to the 1971 German census, the proportions childless in West Berlin exceeded 40 per cent among cohorts of women born between 1885 and 1904. This was due to the effects of wars, the Depression and the departure of families from Berlin (Wagner 1997).



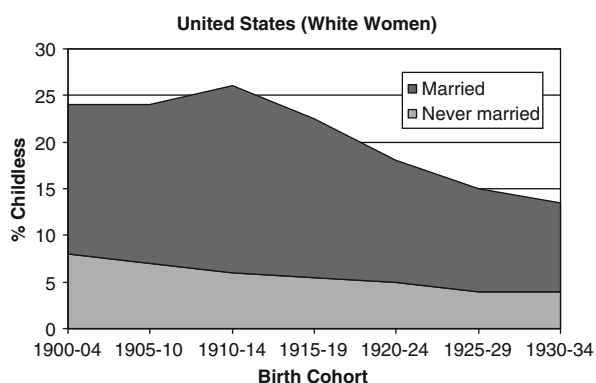
Source: Merlo and Rowland (2000).



Source: Toulemon (1996).



Source: Own computations based on 1971 census and Van Poppel (1992).



Source: Morgan (1991).

Fig. 30.1 Decomposition of total childlessness by marital status among women in Australia, France, The Netherlands and The United States, 1900 – 1934 birth cohorts

Childlessness Among Men

As noted earlier, data on childlessness rates among men are rare. Information on childlessness in pre-1940 male cohorts is based on surveys carried out among older adults, with all the accompanying problems of selectivity. Most routinely published national statistical data on fertility are restricted to women and often just to married women (Coleman 2000). Increasingly, national birth registrations are including information on the father (Murphy and Grundy 2003; Toulemon and Lapierre-Adamcyk 2000) but only for births within marriage or non-marital births acknowledged by the father. In recent decades, representative surveys such as the Demographic and Health surveys, the Family and Fertility surveys, the Generations and Gender surveys and the U.S. National Surveys of Family Growth, have incorporated men in their

samples. Demographers and sociologists have finally come to realize that fertility issues are not women's domain only.

Childlessness among men tends to be over-estimated (Köppen et al. 2007). Men are not always aware of children they may have fathered outside a stable relationship and those who wish to deny such paternity can often do so without being contradicted. Men have a much longer potential reproductive span than women, implying there are analytical pitfalls in imposing age censoring (as is often done in determining women's fertility). Coleman (2000) pointed to the problem of "false paternity", where a married woman claims her husband is the father of the child who is actually her lover's. Analyses of French data show that two per cent of children are not legally recognized by a father and in retrospective surveys two per cent of children are "forgotten" by men (Toulemon and Lapierre-Adamcyk 2000).

Differences between men and women in the rates of childlessness are largely attributable to differences in the proportions marrying (Coleman 2000; Rowland 2007; Toulemon 1996). Drawing upon survey data collected in the early 1990s among men and women who were aged 65 and older, Koropeckyj-Cox and Call (2007) showed that in each of the seven countries surveyed, the proportion childless among men was lower than that among women. Fewer men than women had remained unmarried. Hagestad and Call (2007) showed, for cohorts born between 1900 and 1940, that men had more “second chances” to become parents than women. Their analyses are based on life history data collected among American and Dutch older adults. Among those who remained childless in a first marriage that ended, men were more likely than women to become parents upon remarrying. Men’s fertility is less constrained by the biological clock and men tend to marry women younger than themselves.

The gender difference in proportions childless appears to be reversing. In recent cohorts, more men than women are remaining childless and the reason is that more men are remaining permanently single. Data on marriage patterns in The Netherlands and France show, for example, that in pre-1930 cohorts more women than men remained unmarried but in cohorts born after 1930 more men than women had never married (Ekamper et al. 2003; Toulemon 1996). In previous work (Dykstra and Hagestad 2007a) we have referred to this phenomenon as the “recirculation” of men, whereby previously married men become partners for single childless women. Possibly, women who would like to become mothers are selecting men with proven qualities. A man who has previously supported a family is preferred to an “unused” man with less social prestige.

Outliving Children

Another issue that has been missing in the literature concerns so-called “former parents”. Apart from never having had children, older people might be childless because they have no living children left. Little information exists on the likelihood of outliving one’s children. Estimates for Australia show that between 2.4 per cent (1901–06 cohort) and 0.6 per cent (1936–41 cohort) of women were childless by age 60 on account of the early

death of a child (Rowland 1998b). At more advanced ages, the proportion that has outlived their children is likely higher. In the 1992–1993 Berlin Aging Study, for example, 5 per cent of the men aged 90 and over and 12 per cent of the women in that age group had lost all their children (Wagner et al. 1999).

Future trends in the likelihood of outliving one’s children are governed by opposing developments. Declining family sizes imply an increased likelihood of outliving offspring, whereas the improvements in mortality imply a decreased likelihood. Using fertility and mortality estimates provided by Statistics Netherlands, Beets (2005) predicted little change in the likelihood of becoming childless as the result of outliving one’s children. His calculations showed that the proportion of Dutch women who outlive all their children will remain small: less than one per cent. Murphy, Martikainen and Pennec (2006) carried out similar simulation exercises using British, Finnish and French fertility and mortality data. Their findings are virtually identical to Beets’s. They show, for the 1920–1960 birth cohorts, that the proportion of women who are childless rises by approximately one percentage point between the ages of 80 and 90 due to outliving one’s children. Mortality of children has only a small impact on having no living children because most women have more than one child. The proportion of women without living children is somewhat higher in Finland than in Britain and France because of a larger proportion of women who have given birth to exactly one child. Murphy, Martikainen and Pennec concluded that in 2025 a higher proportion of older adults will have at least one surviving child than ever before.

Infertility

Current older adults did not have the range of fertility treatments when they were in their childbearing years that are available today. Older cohorts conceivably had a higher proportion of involuntarily childless than younger cohorts but data to support this view are scarce. Whelpton and Kiser (1950[1948]) concluded, on the basis of a literature review and their own research, that between 9.5 and 13.5 per cent of couples were childless because of fertility impairments. These couples were physiologically unable to have children, although they wished to have them and attempted to

have them. More recent estimates are that between three and five per cent of couples suffer from biological infecundity from the beginning of their marriage (Templeton 1992; Werner 1986). Reproductive technology has decreased the risk of failure to conceive or to bring a pregnancy to full term. Toulemon (1996) calculated the reduction in unintentional childlessness due to expanded fertility treatments as 0.5 per cent for the 1930 birth cohort, 1.5 per cent for the 1940 birth cohort, 2.5 per cent for the 1950 birth cohort and 2.7 per cent for the 1960 birth cohort.

Fecundability declines with age (Te Velde and Pearson 2002). The age-related fertility decline consists in two components: a declining probability to conceive and a rising risk of spontaneous abortion. The postponement of parenthood in recent decades and associated health problems, has been the topic of much debate (Sobotka 2004). Bonneux et al. (2008) estimated that at present 0.9 per cent of women in The Netherlands, where the age at first birth is among the highest in Europe, are childless as the result of postponement. Figures on involuntary childlessness as the result of fertility postponement in older cohorts are not available.

Explanations of Trends

In the previous sections, I briefly touched upon correlates of childlessness such as remaining unmarried, postponement of marriage, early marriage dissolution and infertility. In what follows I leave aggregate patterns behind and review findings based on individual-level data in an attempt to arrive at an explanation of the high levels of childlessness in cohorts born in the first decades of the twentieth century.

Economic Insecurity?

The high childlessness rates in the early twentieth century cohorts are generally attributed to economic hardship suffered during the Depression (Morgan 1991; Rindfuss et al. 1988; Rowland 2007). Members of these cohorts were in their late twenties and early thirties when the economic crisis hit them, fos-

tering delays in marriage and parenthood. The correspondence, at the aggregate-level, of the timing of the Depression and the high rates of childlessness in the early twentieth century cohorts serves as the basis for attributing childlessness to economic causes. Inferences based on aggregate statistics run the risk of ecological fallacy. Individual-level data on the disruption or postponement of family transitions in the 1930s are rare but they do exist.

Brugger (1938), who conducted a survey among married teachers in 11 Swiss cantons, reported an increase in the proportion of marriages remaining childless during the first five years from 5.4 per cent for marriages contracted between 1919 and 1922 to 21 per cent for marriages contracted in 1931. Sanders (1931), whose analyses are based on the registration cards of all families in Rotterdam for the year 1929, showed childlessness rates of 11, 13 and 23 per cent for marriages contracted in the periods 1904–1913, 1914–1918 and 1919–1928, respectively. Note however, that the large proportion of “sterile marriages” in the 1919–1928 period is partially attributable to a high number of marriages of short duration. Sanders cautioned that these marriages have not been followed long enough to determine whether childlessness is temporary or permanent. Van Bavel, Kok and Engelen (forthcoming) used data from the Historical Sample of The Netherlands, in which individual life histories were constructed from municipal registries. Restricting their analyses to marriages with a duration of at least 15 years, the authors showed an increase in childlessness from 12.9 per cent for couples who married between 1919 and 1923 to 19.3 per cent for couples who married between 1934 and 1938. Their results showed particularly high childlessness rates in couples where husbands were unemployed, thus demonstrating a link between economic insecurity and forbearing parenthood. Van Bavel et al. have probably underestimated the overall proportions childless because they excluded marriages of short duration from their analyses.

Views from the 1930s

Interestingly, demographers publishing during the 1930s rarely refer to unfavorable economic conditions in their descriptions of declining fertility. During the

interbellum, fertility levels in a wide range of European countries, Canada, the United States and Australia were below replacement level part or all of the time (Van Bavel 2007). Scientific debates on “the population problem”, as sub replacement fertility was coined at the time, show striking parallels with views put forward by scholars to explain current low fertility levels. The reports of the meetings of the International Union for the Scientific Study of Population (IUSSP), founded in 1928, are a fascinating source of information. Dublin (1932), a statistician from the United States, spoke about competition between children and “the innumerable accessories to modern life” (p. 117). The Austrian demographer Winkler (1936) viewed the declining birthrate as a symptom of increasing liberalization and individualization and a desire for improved standards of living. In addition, he pointed to the serious food shortages after the demise of the monarchy but clearly assigned less importance to this cause. In an influential report on Europe’s population in the interwar years, Kirk (1946) saw “the growing individualism and rising levels of popular aspiration in a society freed from the rigid structure and taboos of a peasant community” reflected in the declining birth rate.

Several sessions at the IUSSP meetings in the 1930s were devoted to “differential fertility”, the social patterning of reproduction. Most researchers focused on the decline in average family size, not on childlessness *per se*. Insofar childlessness was studied, it was restricted to childlessness among the ever-married. The reports on the stratification of childlessness show strong resemblances to findings on voluntary childlessness published since the 1970s (e.g., Abma and Martinez 2006; Houseknecht 1987; McAllister and Clarke 1998; Mosher and Bachrach 1982; Van den Bandt 1982; Veevers 1971; 1980). Childlessness was largely a big city phenomenon and more prevalent in the upper echelons than in the lower (Hankins 1932; Notestein 1932; Pearl 1938; Winkler 1936). The conclusion reached by the Dutch physician Sanders (1931) was typical of the time: there was little reason to assume that lower natural fertility accounted for the higher childlessness rates in urban areas and among professionals and so, volitional control of births had to be the explanation. Birth control was practiced by those who knew about it, had access to it, had the resources for it and had no moral objections about it.

During the 1930s and 1940s scholars did not only infer the practice of birth control; a number also made it their topic of research. Himes (1938), for example,

wrote that “careful estimates lead me to conclude that 60–75 per cent of the married, fertile couples in the U.S. practice contraception in some form either regularly or intermittently” (p. 207). Forms of contraception that would have been practiced involve abstinence, withdrawal, the rhythm or calendar method, vaginal douches, the use of diaphragms and condoms and in unfortunate cases women resorted to abortion (Gordon 1977; Himes 1938; Thierry 2000). Whelpton and Kiser (1950[1948]) reported results from their intensive Study of Social and Psychological Factors Affecting Fertility, which was conducted in 1940–1941 in Indianapolis among couples married in 1927–1928 and 1929. One of their objectives was to distinguish childlessness because of “control measures” and because of impaired fecundity. According to their medium estimates, 42 per cent of childlessness was voluntary and 58 per cent was attributable to physiological causes.

Choice?

Recent studies of late nineteenth- and early twentieth-century cohorts provide more detailed insight into the correlates of childlessness in marriage. They show that behavior in the early decades of the last century was much more modern than we tend to think. Both Anderson (1998) and Van Bavel et al. (forthcoming) reported higher levels of childlessness among those who marry late. Anderson’s study is based on the 1911 Fertility Census and the 1946 Family Census in Great Britain. The interbellum study by Van Bavel et al. is based on life history data, reconstructed from Dutch registry information. The traditional view (e.g., Hajnal 1965) is that marriage was delayed until the couple had attained the financial means to live as they deemed fit. Morgan (1991) put a twist on this perspective where he argued that manipulating the timing of marriage and childbearing was a normatively approved life-course strategy.

Childlessness might also be driven by other than financial considerations. Anderson (1998) alluded to the rise of the companionate marriage in middle-class groups, where having children might come between shared activities and emotional closeness. Public censure over the childlessness of older brides would have been muted, because they might no longer be capable of having children. “[A] sad shrug of the shoulders might well have been enough to put off further inquiry” (p. 196).

Anderson (1998) showed that volitional control of childbearing in late nineteenth century birth cohorts was not restricted to the middle and upper classes. His analysis is based on the 1911 Scottish Census that has detailed parity data by husband's occupation. Above average childlessness rates were frequent in couples where at least one spouse was especially likely to be geographically mobile (e.g., hawkers and street sellers), in couples where the wife was especially likely to be involved in running a small business with the husband (e.g., greengrocers, fruiterers, general shopkeepers) and among domestic servants and related occupations. In these subgroups, characteristics of the husband's employment seem to have necessitated a strict fertility regime.

Van Bavel et al. (forthcoming) showed that childlessness was a life course option only when it was consistent with the broader social fabric of norms and values. During the interbellum in The Netherlands, childlessness was more likely only in liberal protestant and in religiously mixed marriages (see also Sanders (1931)). Most religious groups considered children as blessings from heaven, where choice was not an issue. Van Bavel et al. also found higher childlessness rates in areas with a higher standard of living, as measured by the density of shops. They argued that those who have become accustomed to a comfortable lifestyle are less likely to make the transition to parenthood.

The accounts given for childlessness in late nineteenth and early twentieth century cohorts are basically the same as those for contemporary childlessness. Morgan (1991) cautioned against hastily concluding that current childlessness is new and revolutionary. I would like to turn that around and state that childlessness prior to the Second World War is not an old kind of childlessness. The determinants of childlessness in the early decades of the last century are strikingly similar to circumstances currently associated with childlessness.

Older Adults' Lives in Historical Context

Notwithstanding the parallels in routes to childlessness in older and younger cohorts, one should be sensitive to differences in historical circumstances. Older adults without children cannot be studied without putting their lives in historical context.

Taking current older adults as the group born between 1915 and 1945, one needs to consider effects of the Depression, the Second World War and the pronatalist 1950s – periods that showed both high and low levels of childlessness. One also needs to consider social changes that have developed gradually, such as increasing individualism, women's greater economic and legal independence and the general growth in prosperity.

Before the Choice Biography

Current older adults did not grow up in the spirit of the so-called "choice biography" (Beck and Beck-Gernsheim 1995; 1996; Giddens 1991) with its emphasis on individuals as architects of their lives. For that reason, it is common to question the relevance of the distinction between voluntary and involuntary childlessness for older cohorts. Recently, scholars have drawn attention to the complexity of "choice" in relation to nonparenthood (Bartlett 1994; Letherby 2002; Morrell 1994). Though the distinction between voluntary and involuntary childlessness has an intuitive appeal, it overlooks that remaining childless is an ongoing practice and/or an outcome shaped by life circumstances (Morrell 1994). Both "active" and "passive" decision making occur (Gillespie 1999). As previously described, these views also ring true for older cohorts of childless individuals.

Several authors have suggested a continuum of childlessness (Letherby 2002; McAllister and Clarke 2000). On one end of the continuum is a small group who say from the outset that they do not want to have children. They have been named "early articulators" (Houseknecht 1987). On the other end of the continuum is a group who are childless due to a medical condition. In between is a group that did not intend to be childless but ended up as nonparents because of unpropitious circumstances (Keizer et al. 2008). The decision was "taken for them" (McAllister and Clarke 2000). There is also a group that never made a decision to have a child. Childlessness is then the consequence of choosing to follow a particular life pattern rather than being an easily defined decision point (Bartlett 1994; Kemkes-Grottenthaler 2003; Morrell 1994). The decision has been to follow a life style on which childlessness hinges. The Canadian journalist Copps (2006) described never having made the decision not to have

children: “I am not childless by choice, although many of my choices have contributed to my being childless” (p. 97).

For many, choosing not to marry is ultimately also a decision to remain childless. The recent rise in childlessness in Japan is attributed to a rejection of marriage (Jolivet 1997). Increasing numbers of young Japanese women prefer to remain single rather than to enter into what they perceive as the oppressive relations of marriage. For the “new spinsters” at the turn of the twentieth century in the United Kingdom, singlehood was a rational choice (Freeman and Klaus 1984; Holden 2005). They were middle- and upper-class women for whom marriage was a less attractive option than the social and economic independence of spinsters. The increasing availability of jobs in light industry, services and businesses in urban areas enabled them to forgo marriage and therefore, parenthood.

Given the social conventions of the first half of the twentieth century, those who eschewed parenthood would not have articulated their decision making the way younger adults currently are able to do (Gillespie 2003). Openly voicing and deliberating the pros and cons of parenthood and childlessness are relatively recent phenomena. For older cohorts, marriage and childbearing were more closely connected than they are today (Billari and Kohler 2004) and options for parenthood outside marriage and for marriage without children were more limited. Nevertheless, as described above, there is evidence that distinct groups of men and women born in the late nineteenth- and early twentieth- century made conscious decisions to not become parents or to limit their parenthood responsibilities. The well-to-do, the better educated, residents of cities and those belonging to more liberal religious denominations were most likely to practice birth control. A certain degree of fertility reduction was also evident in other groups of the population, particularly among those who had difficulty supporting a family or difficulty combining family responsibilities with their jobs.

Greater Stigmatization

Older adults who remained childless in marriage would have been subject to greater censure (May 1995), which is not to suggest that those who now-

days choose to not become parents are no longer stigmatized (Brown and Ferree 2005). Empirical studies on subjective experiences and evaluations of childlessness prior to 1970 are scarce. Popenoe’s (1936) study is a unique source of information on the negative stereotypes associated with nonparenthood in the 1930s. He asked over 100 adult students to list the reasons why people in their networks had remained childless. Reasons were classified as: self-centered (31 per cent), wife’s career (22 per cent), economic pressure (16 per cent), health (9 per cent), dislike of all children (8 per cent), miscellaneous (6 per cent), eugenics (5 per cent) and marital discord (3 per cent). Popenoe concluded that “the great bulk of the voluntary childless marriages are motivated by individualism, competitive consumption economically and an infantile, self-indulgent, frequently neurotic attitude toward life” (p. 472).

Echoes of these negative characteristics are reported in more recent research among the voluntarily childless (Gillespie 2000; Letherby 2002; Mueller and Yoder 1999). Nevertheless, as analyses of repeated attitude surveys show, people have become more accepting of childlessness over the years (Koropecj-Cox and Pendell 2007a; Social and Cultural Planning Office of The Netherlands 1984; 1996; Thornton and Young-DeMarco 2001).

Why Childlessness Might Matter

Dykstra and Hagestad (2007b) have recently proposed to view childlessness as “a road less taken”. A focus on the childless is a focus on those whose lives are not following ready-made scripts. Such a perspective sheds light on the ways in which parenthood structures people’s lives and in that way, contributes to knowledge about the social organization of society. By focusing on individuals who do not make the transition to parenthood, one gains insight into mechanisms that produce social inequality and social cohesion, insofar they are linked with parenthood. The structuring influence of parenthood can be explored on different levels of social contexts: a macro-societal level, a meso-level of networks, communities and civil society and a micro-level of individual behavior. The following theoretical considerations serve as a backdrop for the review of studies on the late-life consequences of

childlessness. An underlying assumption is that patterns established earlier in life will continue to exist later in life.

Structuring Influence of Parenthood at the Macro-level

All societies have an investment in parenthood, because it is the key to the protection and socialization of children, who in turn ensure the future continuity of a social system. Thus, societies are more likely to regulate parenthood than sexual relations and marriage but the regulation takes highly variable forms. First, societies have concerns about how parents behave and will use sanctions to ensure conformity with key requirements of parenting. Parental behavior is subject to formal *regulation by law* (Mason et al. 2001; Millar and Warman 1996). Parents must not only provide their children with the essentials of daily living such as food, clothing and shelter; they must also provide socialization for future adult lives. Failure to provide adequate care or supervision may lead to criminal prosecution for neglect and – ultimately – loss of the parent role.

Second, parenthood has relevance for welfare state entitlements. It is a distinguishing characteristic in the distribution of public resources, goods and services (Folbre 1994; Herd 2006; Thompson and Carasso 2002). Parents receive financial and service benefits not available to non-parents, such as child support, tax relief, subsidized medical plans and care credits in pensions. Lone parents are often eligible for extra benefits and subsidies and have preferential access to housing.

Structuring Influence of Parenthood at the Meso-level

At the meso-level, parenthood serves firstly as an avenue toward *social integration*. Parents often make new acquaintanceships through their children – in the neighborhood, through playmates and via school (Furstenberg 2005; Offer and Schneider 2007). Gallagher and Gerstel (2001) referred to children as “connectors”, facilitating access to neighbors and community members. Children serve as bridges to social

resources in families and other personal relationships (Schoen et al. 1997). Parenthood is often the topic of casual conversations. The flip side is that the childless feel excluded in social gatherings (Alexander et al. 1992; Letherby and Williams 2000). Parenthood is also associated with greater civic engagement. Adults with children are more likely to invest in community improvement and neighborhood activities because it increases life chances for their children (Eggebeen and Knoester 2001).

Second, parents are subject to informal *social control* for much of their adult lives (Umberson 1987). They are admonished to act responsibly, to be caring and to be good role models. There are pressures to refrain from damaging health behaviors and to engage in a health-promoting lifestyle. Another idea is that living with others (a partner, children) requires regulation of activities and a division of responsibilities and obligations (Umberson 1987). Sharing a household implies being subject to informal pressure towards regularity of habits (Anson 1989): sleeping times, meal times and avoidance of adverse exposures imposed on others (e.g., smoking).

Structuring Influence of Parenthood at the Micro-level

At the micro-level of individual lives, parenthood introduces new opportunities and simultaneously restricts engagements in specific life domains. People change their activity patterns in anticipation of or in response to parenthood. The childbearing and employment nexus is a well-known example (Hakim 2000). Recognizing the problems in coordinating parenthood and employment, many women and some men, restrict their investments in gainful employment due to difficulties in combining it with childcare responsibilities. Conversely, some women forgo having children because priority is given to occupational pursuits. Here is where Gallagher and Gerstel (2001) speak of children as *constraints*, which are highly gendered (Koropeckyj-Cox and Pendell 2007b).

In line with the notion of parents as targets of informal social control, there is the notion that parenthood is a *transforming event*. Supposedly, once people become parents their behavior changes, either as a result of “their own self-awakenings or by [internalizing] cul-

tural expectations” (Knoester et al. 2007: p.993). Parents reorder their priorities, sort out what is important to them, become more generative and more strongly focused on the welfare of their children (Eggebeen and Knoester 2001; Knoester and Eggebeen 2006). Interestingly, the notion of parenthood as a transforming event is discussed only in relation to men. The threat of anomie and potentially disruptive deviance posed by men who are not integrated and regulated by the bonds of parenthood is not a new theme in the literature (Akerlof 1998; Mansfield 2006).

Does Childlessness Matter in Late Life

Pohlman (1970) is an early critic of the childlessness literature. He cited the philosopher Albert who described the concept of childlessness as a noncategory. The childless are generally defined in terms of the category to which they do *not* belong: they are not parents and they do not have children. This conception of the childless as a noncategory has influenced the kind of research that has been done on the consequences of childlessness. Much of the research has focused on establishing what the childless do not have and what they are lacking, as exemplified in the title of Rempel’s (1985) paper “Childless elderly: What are they missing?”. Dominant themes in the literature are that the childless need to compensate for not having children, or are somehow psychologically deficient because they are not part of the mainstream of society (Letherby 2002). In what follows, I challenge the common assumption that childless older adults are a uniformly sad bunch of individuals.

Social Networks and Community Involvement

Findings on the social networks of older childless adults and parents show consistent patterns (see Wenger et al. (2007) for a recent review). The childless tend to have smaller support networks than parents (Dykstra 2006; Kendig 1986; Wenger et al. 2000) and this is not only because they are more often single and have no ties to children and grandchildren. The difference in mean

network size remains, even after controlling for differences in the number of family ties (Dykstra 1995; Lang 2004), attesting to the socially integrating functions of parenthood. Social deprivation, in the sense of not having anyone to turn to should the need arise, is most likely among the widowed childless (Johnson and Catalano 1981; Wenger 2001; Wenger et al. 2007). Childless spouses tend to rely heavily upon each other and for them in particular, widowhood creates a void that is hard to fill. The social and emotional void created by widowhood is greater for childless men than childless women (Wenger et al. 2007).

Childless older adults interact with collateral kin more frequently than parents. The never-married childless have the highest levels of sibling contact (Connidis 1989; Strain and Payne 1992). Those without children are more likely than parents to develop close ties with nieces and nephews, often the child of the most proximate sibling (Kendig 1986; Rubinstein, Alexander et al. 1991; Wenger 2001). For the childless who have accumulated wealth or property, the promise of an inheritance often serves as social glue, though feelings of family obligation and the reciprocation of earlier investments in the relationship also serve as motivators for contact and support (Schröder-Butterfill 2004; Wenger, forthcoming).

As regards community involvement, studies show few parental status differences (Connidis and McMullin 1992; Wenger et al. 2007). Those without children are equally likely as parents to be active in the community and in voluntary organizations and to perform volunteer work. A number of studies have noted that older never-married childless women are particularly active socially. The church is an important avenue of social participation for them (Wenger et al. 2007) and they are more likely to provide volunteer services and belong to social groups compared to older married women with children (Cwikel et al. 2006).

Social Services Use

Levels of childlessness are seen as indicators of demands on social services (Kraeger 2004; Wenger forthcoming). The findings on social networks suggest that old people with no children and aging parents are

equally able to sustain their style of life when there is no need for intensive instrumental help or personal care. However, in the face of impaired mobility, failing health or increasing frailty, the childless are in a vulnerable position. Given increasing dependency, individuals without a partner and no children typically have no network members with strong commitment and normative expectations regarding care provision over extended time. Even though norms of reciprocity may give some assistance from individuals whom they helped in the past, their “care accounts” run empty sooner (Choi 1994; Kendig 1986).

Findings from cross-sectional studies conducted in Germany, The Netherlands and the United Kingdom report an over-representation of childless older adults in residential care homes, particularly among men (Koropecj-Cox and Call 2007). Australian census data show that childless women are two times more likely to be in institutions than mothers (Rowland 1998a). Longitudinal studies carried out in the United States and Wales show that childless older adults enter residential care at lower levels of disability (Aykan 2003; Freedman 1996; Muramatsu et al. 2007; Wenger forthcoming). A recent American study shows that high state support for home- and community-based services reduces the risk of nursing home admissions among childless older adults (Muramatsu et al. 2007). The authors note that their findings may reflect policy efforts targeted to those who lack family rather than the ineffectiveness of state support among older parents. Among community-dwelling older adults in Australia and Sweden, the childless are more likely to make use of home-help services than parents (Cwikel et al. 2006; Larsson and Silverstein 2004). Choi (1994), using data from the U.S. Longitudinal Survey of Aging, revealed that childless older adults rely on paid helpers more extensively to meet their needs than parents, possibly reflecting a greater degree of learned self-sufficiency. In countries with few formal care arrangements available, frail childless elderly are particularly vulnerable.

Health

Three bodies of research provide insight into the associations between parenthood and health (see Kendig et al. (2007), for a recent review). The first involves

links between reproductive history and longevity. A consistent finding is that ever-married women with no or only one child and those with five or more children have relatively high mortality rates (Hurt et al. 2006). Post hoc explanations tend to center on selection effects. The most common argument is that low parity is a sign of subfecundity or sterility, both of which in turn are linked to poor health and higher mortality. Poorer protection against hormonally related cancers is another explanation advanced for the excess mortality among childless women. Research on the links between reproductive history and longevity leaves gaps in our knowledge: no information is gained on the health status of men and on that of never-married women. Another drawback is that findings are based on snap-shots: little attention is paid to fertility histories and medical histories through time.

The second body of research involves marital status differentials in health (e.g., Ben-Shlomo et al. 1993; Joung 1996; Waite and Gallagher 2000). Usually parenthood is examined only indirectly. Mortality rates tend to be lower among the married than the unmarried and the marital status differences tend to be greater among men than among women (Brockman and Klein 2004; Cheung 2000; Hu and Goldman 1990; Joung 1996; Lillard and Waite 1995). Explanations for marital status differentials in health broadly divide into those based on health selection and those related to social causation. Health selection implies that people with health problems have lower probabilities of marrying, staying married and remarrying. Social causation implies that the health advantages of the married are attributable to better material resources, avoidance of risky behavior and higher levels of support. The design of health studies rarely makes it possible to disentangle parenthood and marital status effects. The few studies with designs that allow the disaggregation of effects show that permanent childlessness has a negative impact on longevity independent of marital status and socioeconomic status (Grundy and Tomassini 2005; Høyer and Lund 1993; Weitoft et al. 2004). Researchers in the marital status health differentials tradition tend to focus on establishing effects, rather than investigating possible mechanisms. Little attention is paid to determinants in daily living such as stress, health practices and access to support.

The third body of research views parenthood as one of the multiple roles people might occupy.

The aim of this research is to find out whether it is harmful or beneficial to combine the roles of parent (typically measured as having children living at home), spouse and paid worker. Most of the research has focused on women. Increasingly, however, men are being included in research designs (Arber 1991; Hibbard and Pope 1991; Mastekaasa 2000). Competing hypotheses have been put forward. The role strain hypothesis suggests decreased well-being, given the difficulties involved in attempting to meet competing or contradictory expectations and obligations. The role accumulation hypothesis suggests increased well-being resulting from multiple sources of self-esteem and identity, financial independence and social contacts outside the home. The empirical evidence favors the role accumulation hypothesis. The health of women who are married, have children and are employed is good compared to other groups of women (Arber 1991; Fokkema 2002; Hibbard and Pope 1991; Martikainen 1995; McMunn et al. 2006; Waldron et al. 1998; Weatherall et al. 1994). Examinations of the singular and combined effects of marriage, parenthood and employment on health generally show that women who have no children at home tend to have poorer health (Elstad 1996; Martikainen 1995; Weatherall et al. 1994). Parental status makes less of a difference in terms of health than employment and marital status. Limitations of this research for gaining insight into the effects of childlessness on late-life health are that (a) permanent childlessness and no longer having children at home are confounded, (b), little is learned about men and about older women and (c) little insight is given into the mechanisms that might underlie the salutary effects of parenthood.

The Kendig et al. (2007) study of is one of the few that examine parental status differences in late-life health in conjunction with gender and marital status. Using survey data from Australia, Finland and The Netherlands and a wide range of health measures, the authors find few effects of parenthood on health independent of marital history. The only consistent differences that emerge, pertain to health behaviors and hold for Finland and The Netherlands but not for Australia. Childless older people are more often smokers, less likely to refrain from drinking and less likely to engage in physical exercise. The health of formerly married men is particularly poor if they are childless. They report poor general health, have difficulty falling

asleep, are prone to depression, have difficulty walking outdoors and are least likely to engage in physical exercise.

Psychological Well-being

Studies on the psychological well-being of older childless persons and parents underscore the importance of distinguishing earlier life histories. Depending on how they came to childlessness, people will have developed different life strategies, which in turn have consequences for how they function in old age (Dykstra and Hagestad 2007b).

Connidis and McMullin (1993) compared two groups of childless older adults in Canada: those who chose not to have children and those who are childless by circumstance. Childlessness is associated with diminished psychological well-being but only if individuals view their situation as one of circumstance rather than choice. A study carried out by Dykstra and Wagner (2007), using Dutch and German samples, attested to the importance of distinguishing lifelong childlessness from outliving one's children. Dutch men who never had children have relatively low levels of life satisfaction, regardless of marital history and occupational history. Among Dutch women, outliving one's children is associated with relatively low levels of life satisfaction. In the German data, marital history is a more powerful predictor of life satisfaction in old age than parental history. The latter finding is consistent with results from two U.S. studies on loneliness and depression in old age, which show that marital status counts, not parenthood (Koropecj-Cox 1998; Zhang and Hayward 2001). In addition, Zhang and Hayward (2001) reported that unmarried childless men have higher rates of loneliness and depression than women in comparable circumstances.

Conclusion

Demographers and sociologists tend to take the 1950s as their point of departure in analyses of family change. From this perspective, the postponement of marriage and parenthood and the rise in childlessness of recent decades appear as new phenomena. If a longer time

perspective is adopted, then the 1950s and 1960s with their low age at parenthood and low level of childlessness emerge as historical anomalies (Cherlin 1980; Mattessich 1979; May 1995; Uhlenberg 1993). The post World War II period was “extraordinarily pronatalist” (Mattessich 1979, p. 306). Fertility and marriage delays were made up under improved economic conditions (Whelpton 1954). A number of social programs that aided family formation were introduced (May 1995). The GI Bill in the United States is one example: veterans were offered education and training programs, loans for homes, farms or businesses and unemployment pay. In Europe, extensive economic and technical assistance was given by the United States under the Marshall Plan to help the postwar recovery. In the 1960s, Whelpton, Campbell and Patterson (1966) concluded, on the basis of findings from their Growth of American Family studies that “fecundity impairments [were] the chief cause of childlessness’ and that [v]oluntary childlessness [was] nearly extinct” (p. 163).

The adoption of a wider time perspective reveals that current older adults, those born between 1920 and 1940, have the lowest childlessness rates ever recorded. The cohorts that preceded them and the cohorts that follow them have higher proportions of childless individuals. The concerns that are often voiced about high levels of childlessness in the older adult population have no empirical basis.

There is a tendency to think that voluntary childlessness emerged only recently. The data presented in this chapter on marital childlessness in early twentieth century cohorts suggest otherwise. Birth control was practiced and the variations in marital childlessness across social groups show strong resemblances to current patterns: they are highest among those who lived in cities, had higher educations and were in mixed marriages. The arguments used by demographers writing in the 1930s to describe the low levels of fertility of their time show uncanny parallels with arguments that are put forward currently: individualization and a reluctance to give up the advantages of a childless life style.

Existing research on childlessness in old age shows lacunae. A first limitation is the lack of information on childlessness among older men. Vital registrations tend to have data on women only. Large-scale surveys are virtually the only sources of information on childlessness in men and they have the drawback of selectivity

associated with non-response and differential survival. New data collection efforts such as the Integrated Public Use Micro-Data Samples (IPUMS) in the U.S. (Ruggles 2006) and the Historical Sample of The Netherlands (Mandemakers 2006) provide welcome opportunities to examine the life courses of childless women *and* men. Repeatedly, studies described in this chapter show greater parental status differences (insofar they exist) in men’s than in women’s late life outcomes. This observation underscores my plea to more often include men in research on childlessness.

A second limitation and one that is not unique to the childlessness literature, is that analyses generally rely on cross-sectional data, making it difficult to rule out selection effects. Differences between parents and childless individuals may not be attributable to parenthood per se but rather to the characteristics of the people who are likely to have children. The cross-sectional data tend to come from surveys conducted among community-dwelling older adults. This brings a second source of selection: the exclusion of those residing in homes for the elderly and nursing homes. As reported in this chapter, childless older adults are over-represented in institutional facilities. Further research should employ longitudinal designs that allow the examination of the interplay between well-being, childlessness and ultimate outcomes in terms of institutionalization and death.

A third limitation pertains to measures of childlessness. In many studies an “all-or-nothing” approach (Connidis and McMullin 1993) is adopted: one either “is” or “is not” a parent. There remains the need to make differentiations *among* the childless and among parents. As noted in the introduction, studies do not always distinguish between those who have never had children (permanently childless) and those who have outlived their children (“former” parents). Neither do studies always employ research designs that allow an examination of childlessness in conjunction with marital history. The importance of doing so is illustrated by findings showing that when men are married, the absence of children appears to have few consequences for their well-being but when men do not have a partner, being childless is a source of vulnerability. The particularly favorable characteristics of never-married childless women, which have been described repeatedly (Dykstra and Hagestad 2007a), further underscore the importance of acknowledging diversity among childless individuals.

Acknowledgment I would like to thank Évelyne Lapierre-Adamczyk (Université de Montréal) for compiling data on childlessness in Canada and Gunhild Hagestad for her comments on an earlier version of this chapter.

References

- Abma JC, Martinez GM (2006) Childlessness among older women in the United States: Trends and profiles. *J Marriage Fam* 68(4):1045–1056
- Akerlof GA (1998) Men without children. *Econ J* 108(2):287–309
- Alexander BB, Rubinstein RL, Goodman M, Luborsky M (1992) A path not taken: A cultural analysis of regrets and childlessness in the lives of older women. *Gerontologist* 32(5):618–626
- Anderson M (1998) Highly restricted fertility: Very small families in the British fertility decline. *Popul Stud* 52:177–199
- Anson O (1989) Marital status and women's health revisited: The importance of a proximate adult. *J Marriage Fam* 51(1):185–194
- Arber S (1991) Class, paid employment and family roles: Making sense of structural disadvantage, gender and health status. *Soc Sci Med* 32(4):425–436
- Aykan H (2003) Effect of childlessness on nursing home and home health care use. *J Aging Soc Policy* 15(3):33–53
- Bartlett J (1994) *Will you be mother: Women who choose to say no*. Virago, London
- Beck U, Beck-Gernsheim E (1995) *The normal chaos of love* (M. Ritter M, Wiebel J Trans.) Polity Press, Cambridge, UK
- Beck U, Beck-Gernsheim E (1996) Individualization and “precarious freedoms”: Perspectives and controversies of a subject-orientated sociology. In: Heelas P, Lash S, Morris P (eds) *Detraditionalization: Critical reflections on authority and identity* Blackwell, Oxford, pp 23–46
- Beets G (2005) *Weinig ouderen overleven hun kinderen* [Few older adults outlive their children]. *Demos* 21(9):69–72
- Ben-Shlomo Y, Smith GD, Shipley M, Marmot MG (1993) Magnitude and causes of mortality differences between married and unmarried men. *J Epidemiol Commun Health* 47(3):200–205
- Billari FC, Kohler H-P (2004) Patterns of low and lowest-low fertility in Europe. *Popul Stud* 58(2):161–176
- Bonneux L, Zaadstra BM, De Beer JAA (2008) *Verstandige gezinsplanning: Niet te vroeg, maar ook niet te laat kinderen krijgen* [Sensible family planning: Do not have children too late, but not too early either]. *Ned T Geneesk* 152(27):1507–1512
- Brockman H, Klein T (2004) Love and death in Germany: The marital biography and its effect on mortality. *J Marriage Fam* 66(3):567–581
- Brown A, Ferree MM (2005) Close your eyes and think of England: Pronatalism in the British print media. *Gend Soc* 19(1):5–24
- Brugger C (1938) *Die Fruchbarkeit der Lehrerschaft in verschiedenen Kantonen der Schweiz* [The fertility of teachers in several Swiss cantons], *Congrès International de la Population 1937, V: Démographie statistique*. Études Spéciales. Natalité, nuptialité, mortalité Hermann et Cie, Paris, (pp V.178–V.182)
- Cherlin A (1980) Changing family and household: Contemporary lessons from historical research. *Annu Rev Sociol* 9:51–66
- Cheung YB (2000) Marital status and mortality in British women: A longitudinal study. *Int J Epidemiol* 29(1):93–99
- Choi NG (1994) Patterns and determinants of social service utilization: Comparison of the childless elderly and elderly parents living with or apart from their children. *Gerontologist* 34:353–362
- Coleman DA (2000) Male fertility trends in industrial countries: Theories in search of some evidence. In: Bledsoe C, Lerner S, Guyer JI (eds) *Fertility and the male life-cycle in the era of fertility decline* Oxford University Press, Oxford, pp 29–60
- Connidis I (1989) Contact between siblings in later life. *Can J Sociol* 14:429–442
- Connidis IA, McMullin JA (1992) Getting out of the house: The effect of childlessness on social participation and companionship in later life. *Canadian Journal on Aging/Revue Canadienne du Vieillessement* 11(4):370–386
- Connidis IA, McMullin JA (1993) To have or have not: Parent status and the subjective well-being of older men and women. *Gerontologist* 33(5):630–636
- Copps MJ (2006) Patchwork. In: Van Luven L (ed) *Nobody's mother: Life without kids*. Touch Wood, Victoria BC
- Cwikel J, Gramotnev H, Lee C (2006) Never-married childless women in Australia: Health and social circumstances in old age. *Soc Sci Med* 62(8):1991–2001
- Dorbritz J (2005) *Kinderlosigkeit in Deutschland und Europa – Daten, Trends und Einstellungen* [Childlessness in Germany and Europe – data, trends and attitudes]. *Zeitschrift für Bevölkerungswissenschaft* 30(4):359–408
- Dublin LI (1932) The outlook for the American birth-rate. In: Pitt-Rivers GHLF (ed) *Problems of population*. Being the report of the proceedings of the second general assembly of the International Union for the Scientific Investigation of Population Problems George Allen and Unwin, London, pp 115–124
- Dykstra PA (1995) Network composition. In: Knipscheer CPM De Jong Gierveld J, Van Tilburg TG, Dykstra PA (eds) *Living arrangements and social networks of older adults*. VU University Press, Amsterdam
- Dykstra PA (2006) Off the beaten track: Childlessness and social integration in late life. *Res Aging* 28(6):749–767
- Dykstra PA, Hagestad GH (2007a) Childlessness and parenthood in two centuries: Different roads – different maps? *J Fam Issues* 28(11):1518–1532
- Dykstra PA, Hagestad GH (2007b) Roads less taken: Developing a nuanced view of older adults without children. *J Fam Issues* 28(10):1275–1310
- Dykstra, PA, Wagner M (2007) Pathways to childlessness and late-life outcomes. *J Fam Issues* 28(11):1487–1517
- Esgebeen DJ, Knoester C (2001) Does fatherhood matter for men? *J Marriage Fam* 63:381–393
- Ekamper P, Van der Erf R, Van der Gaag N, Henkens K, Van Imhoff E, Van Poppel F (2003) *Bevolkingsatlas van Nederland: Demografische Ontwikkelingen van 1850 tot heden* [Population atlas of The Netherlands: Demographic developments from 1850 to the present]. Netherlands Interdisciplinary Demographic Institute, The Hague

- Elstad JI (1996) Inequalities in health related to women's marital, parental, and employment status – a comparison between the early 1970s and the late 80s, Norway. *Soc Sci Med* 42(1):75–89
- Fokkema T (2002) Combining a job and children: Contrasting the health of married and divorced women in The Netherlands? *Soc Sci Med* 54(5):741–752
- Folbre N (1994) Children as public goods. *Am Econ Rev* 84(2):86–90
- Forste R (2002) Where are all the men? A conceptual analysis of the role of men in family formation. *J Fam Issues* 23(5):579–600
- Freedman VA (1996) Family structure and the risk of nursing home admission. *J Gerontol: Soc Sci* 51(1):S61–S69
- Freeman R, Klaus P (1984) Blessed or not? The new spinster in England and the United States in the late nineteenth and early twentieth centuries. *J Fam Hist* 9(4):394–414
- Frejka T, Sardon J-P (2004) Childbearing trends and prospects in low-fertility countries: A cohort analysis (vol. 13) Kluwer Academic, London
- Furstenberg FF (2005) Banking on families: How families generate and distribute social capital. *J Marriage Fam* 67:809–821
- Gallagher SK, Gerstel N (2001) Connections and constraints: The effects of children on caregiving. *J Marriage Fam* 63(1):265–275
- Giddens A (1991) *Modernity and self-identity: Self and society in the late modern age*. Polity Press, Cambridge, UK
- Gillespie R (1999) Voluntary childlessness in the United Kingdom. *Reprod Health Matt* 7(13):43–53
- Gillespie R (2000) When no means no: Disbelief, disregard and deviance as discourses of voluntary childlessness. *Womens Stud Int Forum* 23(2):223–234
- Gillespie R (2003) Childfree and feminine: Understanding the gender identity of voluntarily childless women. *Gend Soc* 17(1):122–136
- Gordon L (1977) *Woman's body, woman's right: A social history of birth control in America*. Penguin, New York
- Greene ME, Biddlecom AE (2000) Absent and problematic men: Demographic accounts of male reproductive roles. *Popul Dev Rev* 26(1):81–115
- Grundey E, Tomassini C (2005) Fertility history and health in later life: A record linkage study in England and Wales. *Soc Sci Med* 61(1):217–228
- Hagestad GO, Call VRA (2007) Pathways to childlessness: A life course perspective. *J Fam Issues* 28(10):1338–1361
- Hajnal J (1965) European marriage patterns in perspective. In: Glass DV, Eversley DEC (eds) *Population in history*. Edward Arnold, London, pp 101–143
- Hakim C (2000) *Work-lifestyle choices in the 21st century: Preference theory*. Oxford University Press, Oxford
- Hankins FH (1932) Has the reproductive power of western peoples declined? In: Pitt-Rivers GHLF (ed) *Problems of population. Being the report of the second general assembly of the International Union for the Scientific Investigation of Population Problems*, George Allen and Unwin, London, pp 179–188
- Hareven TK (1982) The life course and aging in historical perspective. In: Hareven TK, Adams KJ (eds) *Ageing and life course transitions: An interdisciplinary perspective*, Tavistock, London, pp 1–26
- Herd P (2006) Crediting care or marriage? Reforming Social Security family benefits. *J Gerontol: Soc Sci* 61B(1):S24–S34
- Hibbard JH, Pope CR (1991) Effect of domestic and occupational roles on morbidity and mortality. *Soc Sci Med* 32(7):805–811
- Himes NE (1938) Contraceptive history and current population policy, *Congrès International de la Population Paris 1937, VII: Facteurs et conséquences de l'évolution démographique*, Paris: Hermann et Cie, pp 200–210
- Holden K (2005) Imaginary widows: Spinsters, marriage, and the “lost generation” in Britain after the great war. *J Fam Hist* 30(4):388–409
- Houseknecht SK (1987) Voluntary childlessness. In: Sussman MP, Steinmetz SK (eds), *Handbook of marriage and the family*, Plenum Press, New York, pp 369–395
- Høyer G, Lund E (1993) Suicide among women related to number of children in marriage. *Arch Gen Psychiatry* 50(2):134–137
- Hu Y, Goldman N (1990) Mortality differentials by marital status: An international comparison. *Demography* 27(2):233–250
- Hurt LS, Ronsmans C, Thomas SL (2006) The effect of number of births on women's mortality: Systematic review of evidence for women who have completed their childbearing. *Popul Stud* 60(1):55–71
- Jacobson PH (1950) Differentials in divorce by duration of marriage and size of family. *Am Sociol Rev* 15(2):235–244
- Johnson CL, Catalano DJ (1981) Childless elderly and their family supports. *Gerontologist* 21(6):610–618
- Jolivet M (1997) *Japan: The childless society? The crisis of motherhood*. Routledge, London
- Joung I (1996) *Marital status and health: Descriptive and explanatory studies*. Dissertation Erasmus University Rotterdam
- Keizer R, Dykstra PA, Jansen M (2008) Pathways into childlessness: Evidence of gendered life course dynamics. *J Biosoc Sci* 40(6):863–878
- Kemkes–Grottenthaler A (2003) Postponing or rejecting parenthood? Results of a survey among female academic professionals. *J Biosoc Sci* 35(2):213–226
- Kendig H (1986) Intergenerational change. In: Kendig HL (ed) *Ageing and families: A social networks perspective*, Allen and Unwin, Sydney, pp 85–109
- Kendig H, Dykstra PA, Van Gaalen RI, Melkas T (2007) Health of aging individuals and childless individuals. *J Fam Issues* 28(11):1457–1486
- Kirk D (1946) *Europe's population in the interwar years*. Princeton University Press, Princeton, NJ
- Knoester C, Eggebeen DJ (2006) The effects of the transition to parenthood and subsequent children on men's well-being and social participation. *J Fam Issues* 27(11):1532–1560
- Knoester C, Petts RJ, Eggebeen DJ (2007) Commitments to fathering and the well-being and social participation of new, disadvantaged fathers. *J Marriage Fam* 69(4):991–1004
- Köppen K, Mazuy M, Toulemon L (2007) *Kinderlosigkeit in Frankreich [Childlessness in France]*. In: Konietzka D, Kreyenfeld M (eds), *Ein Leben ohne Kinder: Kinderlosigkeit in Deutschland*, VS Verlag für Sozialwissenschaften, Wiesbaden, pp 83–104
- Koropecykj–Cox T (1998) Loneliness and depression in middle and old age: Are the childless more vulnerable. *J Gerontol: Soc Sci* 53B:S303–S312

- Koropecykj-Cox T, Call VRA (2007) Characteristics of older childless persons and parents: Cross-national comparisons. *J Fam Issues* 28(10):1362–1414
- Koropecykj-Cox T, Pendell G (2007a) Attitudes about childlessness in the United States: Correlates of positive, neutral, and negative responses. *J Fam Issues* 28(8):1054–1082
- Koropecykj-Cox T, Pendell G (2007b) The gender gap in attitudes about childlessness in the United States. *J Marriage Fam* 69(4):899–915
- Kraeger P (2004) Where are the children? In: Kraeger P, Schröder-Butterfill E (eds) *Ageing without children: European and Asian perspectives*, Berghahn Books, Oxford, pp 1–45
- Lang FR (2004) The availability and supportive functions of extended kinship ties in later life: Evidence from the Berlin Ageing Study. In: Harper S (ed) *Families in ageing societies*. Oxford University Press, Oxford, pp 64–81
- Larsson K, Silverstein M (2004) The effects of marital and parental status on informal support and service utilization: A study of older Swedes living alone. *J Aging Stud* 18(2):231–244
- Letherby G (2002) Childless and bereft?: Stereotypes and realities in relation to “voluntary” and “involuntary” childlessness and womanhood. *Sociol Inq* 72:7–20
- Letherby G, Williams C (2000) Non-motherhood: Ambivalent autobiographies. *Feminist Stud* 25(3):719–728
- Lillard LA, Waite LJ (1995) Till death do us part: Marital disruption and mortality. *Am J Sociol* 100(4):1131–1156
- Mandemakers K (2006) Building life course datasets from population registers by the Historical Sample of The Netherlands (HSN). *Hist Comput* 14:87–108
- Mansfield HC (2006) *Manliness*. Yale University Press, New Haven, CT
- Martikainen P (1995) Women’s employment, marriage, motherhood and mortality: A test of the multiple role and role accumulation hypotheses. *Soc Sci Med* 40(2):199–212
- Mason MA, Fine MA, Carnochan S (2001) Family law in the new millennium: For whose families? *J Fam Issues* 22(7):859–881
- Mastekaasa A (2000) Parenthood, gender and sickness absence. *Soc Sci Med* 50(12):1827–1842
- Matteich PW (1979) Childlessness and its correlates in historical perspective: A research note. *J Fam Hist* 4:299–307
- May ET (1995) *Barren in the promised land: Childless Americans and the pursuit of happiness*. Harvard University Press, Cambridge, MA
- McAllister F, Clarke L (1998) *Choosing childlessness*. Family Policy Studies Centre, London
- McAllister F, Clarke L (2000) Voluntary childlessness: Trends and implications. In: Bentley GR, Mascie-Taylor CGN (eds) *Infertility in the modern world: Present and future prospects*, Cambridge University Press, Cambridge, UK, pp 189–237
- McMunn A, Bartley M, Hardy R, Kuh D (2006) Life course social roles and women’s health in mid-life: Causation or selection? *J Epidemiol Commun Health* 60(6):484–489
- Merlo R, Rowland D (2000) The prevalence of childlessness in Australia. *People Place* 8(2):21–31
- Millar J, Warman A (1996) *Family obligations in Europe*. Family Policies Centre, London
- Morgan SP (1991) Late nineteenth- and early twentieth-century childlessness. *Am J Sociol* 97(3):779–807
- Morrell CM (1994) *Unwomanly conduct: The challenges of intentional childlessness*. Routledge, London
- Mosher WD, Bachrach CA (1982) Childlessness in the United States: Estimates from the National Survey of Family Growth. *J Fam Issues* 3(4):517–543
- Mueller KA, Yoder JD (1999) Stigmatization of non-normative family size status. *Sex Roles* 41(11/12):901–919
- Muramatsu N, Yin H, Campbell RT, Hoyem RL, Jacob MA, Ross CO (2007) Risk of nursing home admission among older Americans: Does states’ spending on home- and community-based services matter? *J Gerontol: Soc Sci* 62B(3):S169–S178
- Murphy M, Grundy E (2003) Mothers with living children and children with living mothers: The role of fertility and mortality in the period 1911–2050. *Popul Trends* 112:36–44
- Murphy M, Martikainen P, Pennec S (2006) Demographic change and the supply of potential family supporters in Britain, Finland and France in the period 1911–2050. *Eur J Popul* 22:219–240
- Nicholson V (2007) *Singled out: How two million women survived without men after the First World War*. Viking, London
- Notestein FW (1932) The relation of social status to the fertility of native-born women in the United States. In: Pitt-Rivers GHLF (ed) *Problems of population. Being the report of the second general assembly of the International Union for the Scientific Investigation of Population Problems*, George Allen and Unwin, London, pp 145–169
- Offer S, Schneider B (2007) Children’s role in generating social capital. *Soc Forces* 85(3):1125–1142
- Pearl R (1938) Economic status, differential fertility and contraception as observed in the population of certain large cities of the United States, *Congrès International de la Population 1937, V: Démographie statistique. Études Spéciales. Natalité, nuptialité, mortalité*, Paris: Hermann et Cie, pp V.81–V.96
- Pink B (2007) *Births, Australia 2006*. Australian Bureau of Statistics, Canberra
- Pohlman E (1970) Childlessness, intentional and unintentional. *J Nerv Ment Dis* 151(1):2–12
- Popenoe P (1936) Motivation of childless marriages. *J Hered* 17(12):469–472
- Rempel J (1985) Childless elderly: What are they missing? *J Marriage Fam* 47:343–348
- Rindfuss RR, Morgan SP, Swicegood G (1988) *First births in America: Changing patterns of parenthood*. University of California Press, Berkeley, Los Angeles
- Rowland DT (1998a) Consequences of childlessness in later life. *Aust J Ageing* 17(1):24–28
- Rowland DT (1998b) The prevalence of childlessness in older cohorts of women. *Aust J Ageing* 17(1):18–23
- Rowland DT (2007) Historical trends in childlessness. *J Fam Issues* 28(10):1311–1337
- Rubinstein RL, Alexander BB, Goodman M, Luborsky M (1991) Key relationships of never-married, childless older women: A cultural analysis. *J Gerontol: Soc Sci* 46(5):S270–S277
- Ruggles S (2006) Linking historical censuses: A new approach. *Hist Comput* 14:213–224
- Sanders J (1931) The declining birth rate in Rotterdam: A statistical analysis of the drop in the number of children in 24664 Rotterdam families during the last 50 years. Martinus Nijhoff, The Hague

- Sardon J-P (2006) Recent demographic trends in Europe and other developed countries. *Population* (En edn) 61(197–266)
- Schoen R, Kim YJ, Nathansan CA, Fields J, Astone NM (1997) Why do Americans want children? *Popul Dev Rev* 23(2): 333–358
- Schröder–Butterfill E (2004) Adoption, patronage and charity: Arrangements for the elderly without children in East Java. In: Kraeger P, Schröder–Butterfill E (eds) *Ageing without children: European and Asian perspectives*, Berghahn Books, Oxford, pp 106–146
- Smith GD, Blane D, Bartley M (1994) Explanations for socio-economic differentials in mortality: Evidence from Britain and elsewhere. *Eur J Public Health* 4(2):131–144
- Sobotka T (2004) Postponement of childbearing and low fertility in Europe. Dutch University Press, Amsterdam
- Social and Cultural Planning Office of The Netherlands (1984) *Sociaal en cultureel rapport 1984* [Social and cultural report 1984]. Staatsuitgeverij, The Hague
- Social and Cultural Planning Office of The Netherlands (1996) *Sociaal en cultureel rapport 1996* [Social and cultural report 1996]. Staatsuitgeverij, The Hague
- Stoop IAL (2005) The hunt for the last respondent: Nonresponse in sample surveys. Social and Cultural Planning Office, The Hague
- Strain LA, Payne BJ (1992) Social networks and patterns of social interaction among ever-single and separated/divorced elderly Canadians. *Can J Aging/Revue Canadienne du Vieillessement* 11(1):31–53
- Te Velde ER, Pearson PL (2002) The variability of female reproductive ageing. *Hum Reprod Update* 8(2):141–154
- Templeton AA (1992) The epidemiology of infertility. In: Templeton AA, Drife JO (eds) *Infertility*, Berlin: Springer-Verlag, pp 23–31
- Thiery M (2000) Kyusako Ogino (1882–1975) en Herman Knaus (1892–1970) en de Ogino–Knaus–methode [Kyusako Ogino (1882–1975) and Herman Knaus (1892–1970) and the Ogino–Knaus–method]. *Tijdschrift voor Geneeskunde* 56(20):1514–1517
- Thompson LH, Carasso A (2002) Social Security and the treatment of families: How does the United States compare with other developed countries? In: Favreault MM, Summartino FJ, Steuerle CE (eds) *Social Security and the family*, Urban Institute Press, Washington, DC, pp 123–176
- Thornton A, Young–DeMarco L (2001) Four decades of trends in attitudes toward family issues in the United States: The 1960s through the 1990s. *J Marriage Fam* 33:263–290
- Toulemon L (1996) Very few couples remain voluntarily childless. *Popul En Sel* 8:1–28
- Toulemon L, Lapierre–Adamcyk É (2000) Demographic patterns of motherhood and fatherhood in France. In: Bledsoe C, Lerner S, Guyer JI (eds) *Fertility and the male life-cycle in the era of fertility decline*, Oxford University Press, Oxford, pp 293–330
- Uhlenberg P (1993) Demographic change and kin relationships in later life. In: Maddox GL, Lawton MP (eds), *Annual review of gerontology and geriatrics volume 13. Focus on kinship, aging, and social change*, Springer, New York, pp 219–238
- Umberson D (1987) Family status and health behaviors: Social control as a dimension of social integration. *J Health Soc Behav* 28(3):306–319
- Van Baelen H, Matthijs K (2007) Comparing two methods to reconstruct the kin network outside the household with nineteenth-century Antwerp data. *J Fam Hist* 32(2):149–160
- Van Bavel J (2007) Subreplacement fertility in the west before the baby boom (1900–1940): Current and contemporary perspectives, Paper presented at the 32nd Annual Meeting of the Social Science History Association. Chicago
- Van Bavel J, Kok J, Engelen T (forthcoming) Hoge kinderloosheid tijdens het interbellum in Nederland: De rol van godsdienst, levensstandaard en economische crisis [High childlessness during the interbellum in The Netherlands: The role of religion, standard of living, and economic crisis] In: Maas I, Van Leeuwen M, Mandemakers K (eds), *Nederlandse levenslopen van 1850 tot heden*. Amsterdam University Press, Amsterdam
- Van den Bandt M (1982) Vrijwillig kinderloze vrouwen: Verkenning rond een keuze [Voluntarily childless women: Explorations of a choice]. Van Loghum Slaterus, Deventer
- Van Poppel FWA (1992) *Trouwen in Nederland: Een historisch-demografische studie van de 19e en vroeg-20e eeuw* [Marrying in The Netherlands: A historical-demographic study of the 19th and early 20th century]. Netherlands Interdisciplinary Demographic Institute, The Hague: Report No. 31
- Veevers JE (1971) Voluntary childless wives: An exploratory study. *Sociol Soc Res* 57:356–366
- Veevers JE (1980) *Childless by choice*. Butterworth, Toronto
- Wagner M (1997) Über die Bedeutung von Partnerschaft und Elternschaft im Alter [On the importance of partnership and parenthood in old age]. In: Mansel J, Rosenthal G, Tölke A (eds) *Generationen–Beziehungen, Austausch und Tradierung*, Westdeutscher Verlag, Opladen, pp 121–136
- Wagner M, Schütze Y, Lang FR (1999) Social relationships in old age. In: Baltes PB, Mayer KU (eds) *The berlin aging study: Aging from 70 to 100*, Cambridge University Press, Cambridge, UK, pp 282–301
- Waite LJ, Gallagher M (2000) *The case for marriage: Why married people are happier, healthier, and better off financially*. Doubleday, New York
- Waldron I, Weiss CC, Hughes ME (1998) Interacting effects of multiple roles on women's health. *J Health Soc Behav* 39(3):216–236
- Weatherall R, Joshi H, Macran S (1994) Double burden or double blessing? Employment, motherhood and mortality in the Longitudinal Study of England and Wales. *Soc Sci Med* 38(2):285–297
- Weitof GR, Burström B, Rosén M (2004) Premature mortality among lone fathers and childless men. *Soc Sci Med* 59(7): 1449–1459
- Wenger GC (2001) Ageing without children: Rural Wales. *J Cross Cult Gerontol* 16(1):79–109
- Wenger GC (forthcoming). Childlessness: Facing the end of life. In: Kohli M, Albertini M (eds) *Minimal families: childlessness and intergenerational transfers in European Societies* [Special issue Ageing and Society]
- Wenger GC, Dykstra PA, Melkas T, Knipscheer KCPM (2007) Social embeddedness and late life parenthood: Community activity, close ties and support networks. *J Fam Issues* 28(11):1419–1456
- Wenger GC, Scott A, Patterson N (2000) How important is parenthood? Childlessness and support in old age in England. *Ageing Soc* 20(2):161–182

- Werner B (1986) Trends in first, second, third and later births. *Popul Trends* 45:26–33
- Whelpton PK (1938) United States birth rates by age of mother. *Congrès International de la Population 1937, V: Démographie statistique. Études Spéciales. Natalité, nuptialité, mortalité*, Hermann et Cie, Paris, pp V.71–V.80
- Whelpton PK (1954) Cohort fertility: Native white women in the United States. Princeton University Press, Princeton, NJ
- Whelpton PK, Campbell AA, Patterson JE (1966) Fertility and family planning in the United States. Princeton University Press, Princeton, NJ
- Whelpton PK, Kiser CV (1950[1948]) The comparative influence on fertility of contraception and impairments of fecundity. In: Whelpton PK, Kiser CV (eds) *Social and psychological factors affecting fertility*, vol. 2. Milbank Memorial Fund, New York, pp 303–357
- Wilson C (2007) 30 years below replacement: Understanding fertility, *The Vienna Institute of Demography 2002–2006: A five year portrait*, Vienna Institute of Demography, pp 35
- Winkler W (1936) Der Geburtenrückgang in Österreich [The birth decline in Austria]. In: Harmsen H, Lohse F (eds) *Bevölkerungsfragen: Bericht des Internationalen Kongresses für Bevölkerungswissenschaft 1935*, München: JF. Lehmanns, pp 108–114
- Zhang Z, Hayward MD (2001) Childlessness and the psychological well-being of older persons. *J Gerontol: Soc Sci* 56B: S311–S320

Chapter 31

Marital History and Well-Being in Later Life

Linda J. Waite

Introduction

Social scientists have known at least since Durkheim that social relationships are intimately tied to health and well-being. Those with many close personal ties do better, on average, than those with few, with social isolates particularly disadvantaged, as Durkheim pointed out in *Suicide*. Marriage tends to form the centerpiece of social networks in most societies and plays a key role in the production and distribution of social support, which is one of the reasons that married people tend to live longer, healthier lives than those who are not married.

This chapter outlines the link between marriage and well-being. It summarizes the key features of the social institution of marriage that affect physical, emotional and financial well-being and life satisfaction. It discusses the ways that entering a marriage and leaving a marriage may influence well-being and presents evidence on the well-being of those with differing marital histories. Since many of the social processes at work in the connection between marriage and well-being operate over the long-run, both the conceptual framing and the research evidence are applicable over the life course but especially at older ages.

Marriage as a Social Institution

The most important characteristics of the institution of marriage are permanence, co-residence, joint production and the social recognition of a sexual and

childrearing union. When two adults make a legally-binding promise to live and work together for their joint well-being and to do so, ideally, for the rest of their lives, they tend to *specialize*, dividing between them the labor required to maintain the family. This specialization allows married women and men to produce more than they otherwise would. The co-residence and resource sharing of married couples produce substantial economies of scale; at any standard of living, it costs much less for people to live together than it would if they lived separately. The economies of scale and the specialization of spouses both tend to increase the economic well-being of family members living together.

The institution of marriage also assumes the sharing of economic and social resources and *co-insurance*. Spouses act as a small insurance pool against life's uncertainties, reducing their need to protect themselves against unexpected events. Marriage also connects spouses and family members to a larger network of help, support and obligation through their extended family, friends and others. The insurance function of marriage increases the economic well-being of family members. The support function of marriage improves their emotional well-being.

The institution of marriage also builds on and fosters *trust*. Since spouses share social and economic resources and expect to do so over the long-term, both gain when the family unit gains. This reduces the need for family members to monitor the behavior of other members, increasing efficiency.

Generally, married people produce more and accumulate more assets than unmarried people. The

L. J. Waite
NORC and University of Chicago
Chicago, IL, USA
E-mail: l-waite@uchicago.edu

This chapter was prepared with support from Grant P01 AG 18911 from the Office of the Demography of Aging, Behavioral and Social Research Program, National Institute on Aging.

specialization, economies of scale and insurance functions of marriage all increase the economic well-being of family members and the increase is typically quite substantial. The institution of marriage encourages saving, so that married couples tend to have greater per capita wealth than single adults with the same earnings and other characteristics (Lupton and Smith 2003).

Finally, marriage differs from other, less formal, relationships such as cohabitation primarily in its legal status but also in the expectations that the partners and others hold about the nature and permanence of the relationship. As mentioned above, marriage is a legally-binding contract. Spouses acquire rights and responsibilities with marriage, enforceable through both the legal systems and through social expectations and social pressure. As such, the treatment of marriage in the law shapes the institution and the extent to which it ensures family stability and fosters well-being.

Conceptual Models of Marriage and Health

Let's begin by conceptualizing health not just as the absence of disease or robust physical functioning but as normal physiological response, especially in the regulatory systems. Recent developments in social neuroscience emphasize the role of the body's regulatory systems in adapting to environmental challenge, a process referred to as allostasis. Researchers are only beginning to understand the complexity of the processes that regulate physiological functioning (Cacioppo and Berntson 2002). However current understanding suggests that although the allostatic response has short-term gains, it may have long-term costs. Over time, the repeated over- or under-activation of allostatic responses can lead to allostatic load, or cumulative wear and tear on the body's regulatory mechanisms (McEwen and Stellar 1993). Such wear and tear may be important in the genesis of chronic conditions, such as cardiovascular disease and hypertension (Cacioppo and Berntson 2002).

The concept of allostatic load provides a needed link between social structure and biology in the study of health. In modern societies, humans experience a range of physical, psychological and social challenges. Many, if not all, of these challenges or "stressors" are

socially structured, as are opportunities for recovery and restoration (Cacioppo and Berntson 2002). Thus observed social differentials in health may reflect the effects of socially structured experiences of stress and recovery on the body's regulatory systems (Singer and Ryff 1999).

The long time period over which allostatic load develops suggests that the way stress and recovery are patterned over the life course is key to understanding individual health (Ben-Shlomo and Kuh 2002; Singer and Ryff 1999). Marital history may be particularly important in this regard. Marital status and marital transitions profoundly shape an individual's life. They affect multiple dimensions of social life, ranging from the qualities of relationships to financial well-being to health behaviors. Thus the lifetime patterning of marriage reflects the challenges — and the opportunities for recovery — that an individual faces over the course of his or her life.

Assume that each person enters adulthood with a particular "stock" of health, which reflects both their health endowment at birth and health-affecting experiences in their family of origin (Grossman 1972). As the person makes the transition to adulthood, his or her unfolding marital biography affects this underlying stock of health. For example, the transition to marriage tends to bring an immediate health benefit in that it improves health behaviors for men and financial well-being for women (Bachman et al. 1997; Hahn 1993). Over time, the health of a married person tends to be protected or perhaps even enhanced, through the pathways described above.

A marital disruption, whether caused by divorce or a spouse's death extracts an immediate toll on emotional and physical health, although the impact might depend on characteristics of the person and of the marriage (Williams and Umberson 2004). Prior to a divorce, the health benefits of marriage may have attenuated or become negative as the relationship depreciated in value. Although widowhood is typically not preceded by such deterioration in the relationship, a spouse's illness and the caregiving that accompanies it may reduce the benefits to the caregiving spouse. The long-term impact of marital disruption on health depends on the size of the health shock, the extent of recovery from the shock and the health effects of the disrupted state.

Remarriage following a disruption re-establishes the flow of benefits of marriage. However, the remarried face unique challenges to their relationship, for

example the presence of stepchildren, a lack of institutionalization of the key roles involved (Cherlin 1978) and possible financial responsibilities to another household, which may make higher order marriages less advantageous than first marriages.

Marriage and Health: What We Know

Married people tend to have better physical and emotional health than single people, at least in part because they are married (Goldman et al. 1995; Lillard and Waite 1995; Umberson 1992; Waite and Hughes 1999). The social support provided by a spouse, combined with the economic resources produced by the marriage, facilitate both the production and maintenance of health. Married adults show better health outcomes than the unmarried across a variety of acute and chronic conditions, including colds, cancer, heart attacks and surgery (Cohen et al. 1997; Goodwin et al. 1987; Gordon and Rosenthal 1995). Married persons are also less likely to die in any given period than the unmarried, although the longevity benefits of marriage are much larger for men than for women (Lillard and Waite 1995; Ross et al. 1990).

The mechanisms through which marriage improves physical health differ to some extent for men and women. Men tend to gain a confidant and accompanying social support when they marry (Umberson et al. 1996). Wives often monitor their husbands' health behaviors, such as eating habits, alcohol and drug use and sleep patterns (Umberson 1992), so getting and being married tend to improve men's health behaviors, reducing drinking and risky behaviors, improving diet and sleep and encouraging a settled life style (Waite and Gallagher 2000). Wives often manage their husband's medical care and facilitate adherence to medical regimens. Men also gain from their wife's household management and from her involvement in their careers (Grossbard-Shechtman 1993). According to Steven Nock (1998), being married allows men to act out their masculinity in socially constructive ways, giving structure and meaning to their lives and helping them avoid risky and dangerous behaviors and acquaintances (Sampson and Laub 1993).

Marriage improves women's physical health by increasing income and access to the things that money can buy, including private health insurance, home ownership and income in excess of needs (Hahn 1993; Hirschl et al. 2003). Lillard and Waite (1995) found that for women — but not for men — the improved financial well-being that often accompanies marriage accounts for much of its beneficial effect on longevity. However, married women also show advantages in immune function. Kiecolt-Glaser et al. (1987) found sizeable deficits in a number of measures of immune function among divorced women compared to married women matched on other characteristics. These deficits appear among all the divorced women they studied, not just those whose marriage ended recently. It is likely that the stress of declines in financial well-being contributes to the relatively poor immune function of divorced women.

A consensus exists that marriage improves men's health and reduces their mortality quite dramatically and, while still significant, is much less important in the physical health and longevity of women (Ross et al. 1990) perhaps because the health behaviors of single men tend to be poor while those of single women tend to be relatively good.

The gains from marriage may depend on its quality; conflictual marriages are a source of stress and unhappiness and distant marriages may provide little support. If some of the benefits of marriage come from trust and teamwork between the partners, those in poor quality marriages probably do worse on these dimensions than those in high quality marriages. In fact, a large body of research supports this view, at least for emotional well-being and physical health (Proulx et al. 2007). Those in marriages with which they are dissatisfied report higher levels of distress than those who have never been married and those in happy marriages (Williams 2003). Those in poor quality marriages when first observed show more negative trajectories of health than those in better marriages (Wickrama et al. 1997). Marital conflict negatively affects the functioning of both immune and endocrine systems, pointing to one pathway through which poor quality marriages lead to poor health (Kiecolt-Glaser et al. 1997). Marital quality seems to be more strongly related to women's well-being than men's in the cross-section but similarly related longitudinally (Proulx et al. 2007).

However, we know less about the relationship between marital quality and some of the other benefits

of marriage, such as financial well-being and work achievements. Even poor quality marriages generally provide risk sharing, companionship and economies of scale to both partners, household services to men and financial resources to women. Some research suggests that children benefit on some dimensions from growing up with two married parents even if the quality of the marriage is poor, as long as it is not openly conflictual (Amato and Booth 1997).

Conceptual Models of Divorce and Health

Divorce severs the legal contract between spouses, ending their marriage. Recent changes in family law appear to have made marriage less stable. Historically, in the U.S. and many other countries, both secular and religious law generally viewed marriage vows as binding and permanent. The marriage contract could only be broken if one spouse violated the most basic obligations to the other and could be judged "at fault" in the breakdown of the marriage.

Beginning in the mid-1960s, however, states in the U.S. substantially liberalized and simplified their divorce laws. One of the key features of these changes was a shift from divorce based on fault or mutual consent to unilateral divorce, which required the willingness of only one spouse to end the marriage. Most states also adopted some form of "no-fault" divorce, which eliminated the need for one spouse to demonstrate a violation of the marriage contract by the other. The shift to unilateral or no-fault divorce laws was accompanied by a surge in divorce rates in the U.S. At least some of the increase in divorce rates appears to have resulted directly from the shift in the legal environment in which couples marry and decide to remain married, or in which they divorce (Friedberg 1998; Matouschek and Rasul 2008; Rasul 2004). The link between divorce rates and laws that permit unilateral divorce has led several states to develop alternative, more binding, marriage contracts, such as "covenant marriages."

The divorce rate, which reflects the number of divorces in a year relative to the number of married people, rose continuously for more than a century in the U.S. and many similar industrialized countries, then leveled off at a fairly high level in about 1980. In the U.S., the best estimates suggest that around one

half of all marriages will end in separation or divorce rather than in the death of one of the partners. Recent data for the U.S. show that after 5 years, 20 per cent of all first marriages ended through separation or divorce. After ten years, this figure is 33 per cent and after fifteen years, 43 per cent (Bramlett and Mosher 2002).

Marital disruption severs a fundamental human bond, results in the loss of a close, confiding relationship (which may have depreciated in value with the approach of the divorce) and often leads to a substantial reduction in financial well-being, especially for women (Peterson 1996). Bereavement has many of the same effects (Holden and Kuo 1996; Holden and Smock 1991), although it generally is not accompanied by the conflict that often characterizes divorce. The end of a marriage entails, at the very least, an adjustment and often brings stress, loss and pain. All may diminish emotional health, at least in the short-run.

The dissolution of a marriage by divorce may increase psychological distress and reduce emotional well-being through a number of mechanisms. First, marital disruption is generally an acrimonious process (Hopper 1993), marked by high levels of interpersonal conflict and anger, which increases risk of couple violence (Mazur and Michalek 1998; Wallerstein and Blakeslee 1989). These negative experiences and emotions both cause distress and lead to a decline in positive emotions and evaluations (DeGarmo and Kitson 1996). Second, marital disruption tends to reduce the economic well-being of former spouses (McManus and DiPrete 2001) and often entails downward residential mobility (Astone and McLanahan 1994). The economic problems that often follow divorce may reduce emotional well-being. Third, the disruption and acrimony around the divorce may reduce the effectiveness of parenting and may lead to emotional and behavioral problems for children (Cherlin et al. 1998; Wallerstein et al. 2000), increasing distress for parents. Finally, the end of a marriage signals the failure of an intimate relationship, which may reduce emotional well-being, at least until and unless the person enters a new relationship. Since marriage is a central source of social support (Ross 1995; Umberson et al. 1996), divorce may destroy or weaken support networks, sever relations with in-laws and damage friendship networks, thus reducing ability to deal with stress during a stressful period.

Several conceptual models have been developed to explain the impact of divorce on emotional

well-being. The Crisis model sees marital disruption as a stressful life event, even when the marriage was unhappy and divorce was desired (Turner et al. 1995). The uncertainty, acrimony, negotiations, residential changes and financial reversals are often extremely stressful during the course of the divorce or separation. According to this model, emotional well-being falls during the divorce process, but later returns to pre-divorce levels. Booth and Amato (1991) found such a pattern, whereby levels of stress increase in the period prior to divorce, then decline to levels comparable to those reported by the married. Their results suggest that the “crisis” period is about two years, after which divorced and married people do not differ in reported levels of stress. Hetherington and Kelly (2003) also found a crisis period of about two years, during which most people showed some type of emotional problem. However, in their study of divorced couples over 30 years they also found long-term emotional problems in at least one partner in almost a third of the couples (Hetherington and Kelly 2003).

A second model focuses on the *state* of being divorced or separated. This perspective points to the declines in financial well-being that accompany divorce (Peterson 1996; Smock et al. 1999), the strains of single parenthood (McLanahan 1983) and the social isolation experienced by the divorced. Divorced people tend to have more chronic stressors in their lives and they also tend to have less social support with which to cope with these stressors (Johnson and Wu 2002). According to this perspective, *getting* divorced is stressful and *being* divorced is stressful, so that divorced people may show relatively persistent deficits in emotional well-being compared to their previous state or to married people. Mastekaasa (1995) found, in a Norwegian sample, that people who divorced or separated showed a significant increase in psychological distress over both the short-term (up to four years following the divorce) and long-term (from four to eight years following the divorce). Kiecolt-Glaser et al. (1987) found that the immune function of women who had divorced recently showed deficits compared to otherwise similar married women but so did the immune function of women who had been divorced for some time. Both these findings provide support for the *State* model.

Divorce also generally reduces financial well-being, both through the direct costs of the dissolution process and through the loss of economies of scale,

risk pooling and shared income. Women, especially those with dependent children, tend to see a substantial decline in their standard of living (Peterson 1996). Men who were the sole earners may experience some improvement but men whose wives were employed, who comprise the substantial majority, experience a decline in economic well-being both from the loss of their ex-wife’s earnings and from compulsory and voluntary child support payments (McManus and DiPrete 2001).

Conceptual Models of Widowhood and Health

All marriages end either through the death of one of the spouses or through divorce, with widowhood the mark of a successful, “life-long” marriage if it occurs at older ages. Divorce and widowhood rank among the most stressful life events one can experience. The death of a spouse following an illness is preceded by a period of health decline and disability during which the surviving spouse may have provided care and lost some of the services provided by a healthy spouse. These services might include companionship, financial support, housekeeping, emotional support, health monitoring, information sharing and social connection and support, depending on the type and severity of the illness. Recently widowed men and women face dramatically increased chances of dying themselves in the immediate aftermath of their spouse’s death, although this widowhood effect may be larger for white than for black spouses (Elwert and Christakis 2006).

Widowhood is similar to divorce in that it is a period of extreme stress marked by the loss of a key social and emotional relationship. In both cases, the value of the relationship may have deteriorated prior to the marital loss, due to ill health and disability in the case of widowhood and due to marital discord in the case of divorce. However, widowhood differs markedly from divorce in that it is an expected part of the marital life course, signaling, when it occurs at older ages, the successful end of a life-long relationship. Widows do not experience the distancing from friends and in-laws and sometimes children, often caused by divorce. Widows generally retain the financial assets of the couple, including pension rights and the family home. Widowhood is not marked by the conflict and violence that often results from divorce.

Both widows and widowers suffer, however, from the loss of the benefits of marriage. Widowed women suffer particularly from loss of financial resources (Holden and Smock 1991). Widowers traditionally lose household services, their confidant and their key connection to family and friends.

Marital Transitions and Health: The Evidence

Williams and Umberson (2004) examined the impact of five-year marital stability and change on the self-rated physical health of persons age 24 and older. The authors found that the continuously unmarried do not evaluate their health more negatively than the continuously married and that the benefits of entry into marriage are substantial for men and effectively zero for women. They also found that for older persons, a divorce or widowhood has a negative impact on self-assessed health for men but not for women. Their findings also suggest that recovering from divorce or widowhood is more difficult late in life than in young adulthood. Remarriage improves health only among younger men and women; among older adults remarriage is associated with declines in self-rated health. Neither the positive or negative effects of remarriage change over the five years following the event. Transitions out of marriage also increase the risk of developing chronic disease, functional limitations and disability (Pienta et al. 2000).

If marital loss leads to declines in health and to onset of disease, it might be expected that divorce or widowhood would also increase mortality. A sizeable body of research shows this to be the case. Lillard and Waite (1995) found that both men and women show declines in the hazard of dying when they marry, although these effects appear at marriage for men and cumulate with duration of marriage for women. Men who become unmarried show large increases in the chances of dying, net of other characteristics, regardless of whether their marriage ends with divorce, separation or widowhood. For women, the end of a marriage through divorce or separation increases the risk of death (see Hemström 1996) but the death of the husband does not. Brockmann and Klein (2004) found similar results among West German adults; the health benefits of marriage accumulate over time, while the negative health con-

sequences of being single, divorced, or widowed attenuate over time. The beneficial effects of marriage are non-linear; they are most pronounced in the early years of marriage. Men benefit immediately from marriage, while women's mortality risk actually increases at first. They find no evidence that these effects differ by marriage order.

Widowhood and Well-Being

Much of the research on the link between marital transitions and well-being includes all marital loss, generally separating these into separation, divorce and widowhood but discussing them together, as above. A separate literature focuses only on the death of a spouse and its consequences. This literature is rich both empirically and theoretically, so it is discussed in some detail.

Physical Health

The ongoing stress of having and caring for a sick spouse prior to death appears to have long-term effects on the health and functioning of the survivor; widowers whose wives had serious ongoing health problems before death report more severe problems than other men with carrying out activities of daily living several years later (Lee and Carr 2007). The widowed also experience a decline in health reminders and health assistance received from others, which undermines health and increases risky health behaviors (Williams 2004). Perhaps as a result, widows and widowers show less healthy lifestyles than married men and women, with increased smoking and less physical activity among men (Umberson 1987; Umberson 1992) and loss of appetite and body mass among women (Shahar et al. 2001). Zhang and Hayward (Zhang and Hayward 2006) found a significantly higher prevalence of cardiovascular disease among the widowed than among the married. Widows and widowers face increased chances of dying themselves, especially in the months following the death of their spouse (Elwert and Christakis 2006; Iwashyna 2001).

Emotional Health

Men and women whose spouses have died tend to experience elevated symptoms of depression and anxiety following widowhood, combined with grief, yearning and intrusive thoughts about their spouse (Carr 2004). Emotional adjustment tends to depend, as might be expected, on the quality of the marital relationship; those who were highly dependent on their spouses show higher levels of anxiety than those who were not dependent on their spouses. Those whose relationships were conflicted at baseline report lower levels of yearning and those reporting high levels of marital closeness and dependence on their spouses reported higher levels of yearning. Women who relied on their husbands for instrumental support had significantly higher levels of yearning than men who depended on their wives (Carr et al. 2000). Marks and Lambert (1998) found that women (but not men) who were widowed in the last five years show more depression and men who were widowed report less hostility than the continuously married. Both widowed men and women report less purpose in life than the continuously married.

Marital Transitions and Well-Being: Challenges to Inference

Emotional Health

A number of recent studies have attempted to assess the mental health consequences of marriage, divorce and widowhood and to separate these from the selection of emotionally health individuals into marriage and distressed or unhealthy individuals. These studies followed individuals over time as some marry, some divorce or become widowed and some retain their previous marital status. Consistently, transitions into marriage improve mental health, on average, for both men and women and transitions out of marriage decrease it (Horwitz et al. 1996; Marks and Lambert 1998; Simon 2002). It is important to note that although rates of mental illness are quite similar for men and women in the United States today, women show higher rates of affective and anxiety disorders, with symptoms of nonspecific anxiety, distress and depression, whereas

men have higher rates of antisocial personality and substance abuse dependence disorders, which manifest themselves in antisocial behavior and drug and alcohol problems (Kessler et al. 1994).

Simon (2002) found that divorce increases symptoms of emotional distress among both women and men but women show greater increases than men in depressive symptoms following divorce and men who marry show greater reductions in alcohol consumption than women who marry. Both men and women who divorce report a significant increase in alcohol abuse. Simon also found men and women who divorced reported more depression and more alcohol problems earlier than those who remained married, which she interprets as both a cause *and* a consequence of disruption.

Analyzes that control for the selection of the psychologically healthy into marriage and also include a wider range of measures of mental well-being, find that although there are differences by gender in the types of emotional responses to marital transitions, the psychological benefits associated with marriage apply equally to men and women (Horwitz et al. 1996; Marks and Lambert 1998; Simon 2002).

Of course, the story is more complicated. Recent research has extended this line of work to examine differences in the consequences of marital transitions for women and men with various characteristics. This research shows considerable heterogeneity in effects and some surprising similarities.

It seems logical that people who enter marriage disadvantaged on some dimension, such as ill health, a criminal record, a prior divorce, children from a previous relationship, or poor emotional well-being bring less to marriage themselves and are likely to get less out of it than those without these problems. Both scholars and advocates have argued that those in marriages marked by violence, especially women, will gain enormously from leaving those relationships. None of these obvious relationships seems to find consistent support.

Current government policy aims to encourage single mothers to marry as a means of improving their lives and the lives of their children (Lichter et al. 2003). But single women with children may benefit less from getting married than childless women might, because the pool of men available to them is less attractive than the pool of men available to women without children (Harknett and McLanahan 2004). Single mothers who marry face significantly

higher chances of marital dissolution than childless women who marry (Bramlett and Mosher 2002) and divorce has substantial negative effects on women's physical and emotional health and on that of children. Williams et al. (2008) found that marrying and then divorcing is worse for the emotional and physical health of single mothers than for other women, perhaps because of the substantial consequences of divorce for their financial well-being; economic strain is a key mechanism through which marital disruption undermines emotional and physical health. Single mothers who marry also have lower quality relationships than other women and are more likely to divorce. This study finds that single mothers who marry get about the same benefits for psychological well-being as childless women if they avoid divorce but get smaller benefits for physical health, in part because they have lower levels of marital quality.

One could argue that those with poor mental health prior to marriage would be less likely to marry and would benefit less from marriage than those with good mental health. Depression in one partner might limit the benefits that person could provide to a spouse, increase the demands on the other spouse and reduce actual and perceived marital quality. But Frech and Williams (2007) found, instead, that those who were depressed before they married show *larger* gains in emotional well-being than others and that marital quality plays a similar role in moderating the effect of marriage on mental health for those who were depressed prior to marriage and those who were not. The patterns are similar for men and women. In fact, Williams found that the psychological benefits of getting married are quite modest for those who were not previously depressed and sizeable only for those in poor mental health before marriage. These findings stand conventional wisdom on its head.

Another recent study does the same for marital violence. Kalmijn and Monden (2006) found, consistent with previous research, that divorce leads to higher levels of depressive symptoms for women but that men show no change. People who divorce from a marriage characterized by verbal aggression show a *stronger* increase in depressive symptoms than others who divorce, they found. Their results also show that women who divorce from a marriage in which there was physical aggression see a *greater* increase in depressive symptoms than other women who divorce. They suggest that the conflict that characterized the

marriage often continues or escalates after the divorce and so continues to reduce emotional well-being.

Remarriage

To the extent that the benefits of marriage flow from the *state* of being married, then marital disruption either through divorce or widowhood interrupts the flow of benefits, which may consist of financial well-being, health or social connections and remarriage re-establishes the flow of benefits. This suggests that the *duration* of marriage matters. Do transitions into a second or higher-order marriage bring benefits equal to those of a first marriage? In theory, later marriages bring all the same advantages — companionship, economies of scale, trust, social connection and so on — that come with a first marriage. If later marriages bring the same levels and types of advantages then spouses in these marriages should show outcomes equal to those of the once-married who had been married the same number of years.

Evidence on the benefits of remarriage is mixed, however. Both Barrett (2000) and Marks and Lambert (1998) found that higher-order marriages are less enhancing to mental health than first marriages. Zhang and Hayward (2006) found the prevalence of cardiovascular disease to be significantly higher for the remarried than for the continuously married. However, remarriage seems to bring substantial financial advantages, especially for women, essentially making up for the reversals that accompany divorce (Wilmoth and Koso 2002).

Marital History

An individual's marital history is composed of marital transitions, the timing of these transitions in the life course and the consequent duration in particular marital statuses. Marital transitions include entering marriage and leaving marriage through either divorce or a spouse's death. The occurrence of transitions, their type and the ages they occur determine an individual's duration in a particular marital state.

Embedded in this biographical structure are the costs and benefits of marital events and marital relationships.

As described above, both marital transitions and marital states affect well-being, including physical and emotional health and financial well-being, in the near term. The stress of divorce or loss of a spouse appears to affect health habits, including nutrition, alcohol consumption, exercise, health care utilization and sleep, often differentially for men and women and for the divorced vs. widowed. Both divorce and widowhood tend to reduce financial well-being. Both also tend to reduce emotional well-being and social integration. The stress of the loss of the marriage seems to undermine immune and endocrine function. Stressful life events, including marital loss, can have persistent effects on well-being (Ensel et al. 1996) and may set one on a negative trajectory. Thus, the effects of marital loss may be long lasting and may accumulate over time. Individuals may “draw down” their stock of health during the period in which a marital loss occurs in much the same way as they tend to draw down their financial reserves during divorce and widowhood, especially if the death of the spouse is preceded by a period of ill health. During the period following the marital loss, the newly unmarried individual does not receive the benefits of marriage. Think of this as a period of not investing or investing less in both health and financial reserves. If and when the person remarries, the benefits of marriage resume their flow. But both their health and their pocketbook may show the one-two punch of the period around the loss when outlays vastly exceed inputs and the period of low investment or spend down when unmarried. Both health and financial well-being may be reduced by the period of ill-health or marital conflict that often precedes widowhood or divorce. This reasoning suggests that an individual’s current physical, emotional and financial well-being will reflect both his or her current marital state and any marital transitions ever experienced.

In addition, the experience of marital loss may change attitudes in ways that change the benefits from any future marriage. Divorce is more likely than widowhood to lead to negative attitudes toward the stability of marriage, perhaps reducing investment in later marriages (Amato and Rogers 1999). This suggests that remarriage after widowhood would carry greater benefits than remarriage after divorce.

Evidence on the impact of marital history on well-being is beginning to accumulate and suggests that marital transitions matter for a good deal for physical health and financial well-being and somewhat less for emotional health.

Physical Health

If being married protects the health of men and women, as discussed above and divorce and widowhood damage it, then it follows that we should see differences in health in the cross-section among those with different marital statuses. Since chronic conditions like heart disease and hypertension develop over a substantial period, they may respond to the time spent in advantaged and disadvantaged statuses. The stress of marital loss may leave an imprint on health later in life, suggesting that we should see differences among those with varying marital histories. In fact, we do. In a broader study of life course effects on health, Grundy and Holt (2000) found that women who married young had worse health and a greater chance of disability in old age than others, as did those married twice or more. Pienta et al. (2000) found that in late mid life married people have the lowest rates of morbidity for fatal and nonfatal chronic diseases, functional limitations and disability but they found very little evidence of a simple linear relationship between length of marriage and prevalence of any of these diseases or conditions. Men and women who have experienced a marital loss of any kind show a higher prevalence of cardiovascular disease (CVD) than those who have been continuously married or those who have never married. Onset of CVD, however, is higher among women who have been divorced or widowed but not among men with the same experience (Zhang and Hayward 2006), implying that for women, the health disadvantage of those with a marital loss increases as they advance to old age. Their results provide some support for the hypothesis that the stress of loss is responsible for decrements to health, especially among women.

In research under way, Hughes and Waite (2007) found that among the married, those with a history of marital loss report poorer self-rated health, more chronic conditions and more functional limitations than those who have never been widowed or divorced. If the differences in health between the married and the unmarried result only from the huge costs to health of marital loss, rather than from any protective effect of marriage, we should see similar health for those who have never married and the married who have never been widowed or divorced, since neither group has suffered a marital loss. However, Hughes and Waite (2007) found that the never married show significantly

worse health than the continuously married on three dimensions: self-rated health, mobility limitations and depressive symptoms, suggesting that marriage provides some health protective effect. The state of being divorced or widowed also seems to damage health, perhaps because of ongoing stresses and lack of key resources. Hughes and Waite found a positive relationship between the per cent of years since first marriage spent divorced or widowed and both chronic conditions and mobility limitations among people who have experienced at least one marital disruption, conditional on current marital status and marital history. So this study finds support for both the stress model and the state model of the effect of marriage and marital loss on health.

The study that assessed relationship between the most comprehensive set of characteristics of marital histories and onset of chronic disease concludes that, for women, a combination of early marriage, marital duration and cumulative number of divorces play independent roles in this process (Dupre and Meadows 2007). Women who marry before age 19 face a higher risk than others of developing a serious illness, as do those who get divorced one or more times. Duration married seems to provide a protective effect against future ill health, allowing women with long marriages to delay the onset of serious disease.

For men, Dupre and Meadows (2007) found somewhat different patterns: a combination of marriage duration, years spent divorced and cumulative number of widowhoods increase the onset of disease. They concluded that marital stability over the life course benefits men's health and point to poor health behaviors as a key pathway through which time spent unmarried damages health and increases risk of serious illness.

This study finds that men and women respond to different marital losses; widowhood but not divorce disadvantages men and divorce but not widowhood, disadvantages women. However, the negative effect of divorce appears to diminish over time for women whereas the negative effect of widowhood for men does not. The authors interpret these findings as consistent with the view that marriage improves women's health by improving their financial well-being, which gives women greater access to health-producing resources and reduces stress. They suggest that widowhood for men is both unusual, since women are much more likely to become widowed than men and tends to occur

at older ages when chances of becoming ill are highest and remarriage is less likely. Most scholars point to men's loss of household services, social connections and social support as key to the negative effects of widowhood on their health.

Mortality

This hypothesis is also supported by findings that the remarried, divorced and widowed face greater risk of mortality than the continuously married, which is precisely what Tucker et al. (1996) found in an advantaged sample. This same study found that, for women, only those currently separated or divorced were at significantly greater risk of dying; the remarried and never married did not differ from the continuously married. Number of years married did not account for the differential. The authors hypothesized that childhood personality and family characteristics might affect both chances of stable marriage and later health, such that more conscientious children from two-parent families would be advantaged on both dimensions as adults; the two childhood psychosocial characteristics explain some but not all of the mortality differences between the continuously married and those with a marital loss.

Zhang and Hayward (2006) found that remarried, divorced and widowed men are not more likely to die of cardiovascular disease but are more likely to die of other causes than continuously married men, whereas divorced and widowed women are more likely to die of cardiovascular disease *and* of other causes than continuously married women. They found that remarried women and never married women do not face higher risks of death from either CVD or other causes.

Marital loss may be most damaging when it is most unusual, during early adulthood to midlife. Lund, Holstein and Osler (2004) found strong support for this hypothesis among men; mortality decreased with number of years married, increased with number of divorces and with number of years divorced. Cumulated years divorced or widowed strongly predicted mortality among young men in this sample.

Selection into marriage is powerful, with those with below-average mortality risk more likely to marry, especially among men (Brockmann and Klein 2004). This study of West German adults finds that both men

and women benefit in reduced mortality risks from each year that they had previously been married, with a stronger effect for women. In addition, previous divorce or widowhood does not affect women's chances of dying, although it increases men's risk significantly. These results are similar to those of Lillard and Waite (1995) for the U.S. Brockmann and Klein (2004) found a strong effect of marital biography on men's mortality risk such that even after remarriage, a previous divorce increases their chances of dying by about 4 per cent each year. Both divorce and widowhood increase the chances of dying in the first two years after the event but the risk falls in subsequent years (Williams and Umberson 2004). Interestingly, this study finds that risk of dying increases significantly in the first several years after a marriage; the authors reason that any transition is stressful, often requiring geographic mobility, changes in social networks and other adjustment, with adjustment to the new situation and a fall in the risk of mortality as one accommodates.

Emotional Health

Both divorce and widowhood damage psychological well-being in the short-run, although most people recover over time. Marital loss might affect psychological well-being in the long-run by changing people's views of marriage and marital permanence, particularly in the case of divorce. Having been divorced increases acceptance of alternatives to marriage, for example (Cunningham and Thornton 2005). Barrett (2000) examined the link between marital histories and three dimensions of mental health — depressive symptoms, anxiety and substance use — for a local sample of persons age 30 and above. She found that the relationship between current marital status and mental health is conditioned by marital history. Currently-married persons with a history of divorce report more depressive symptoms, more anxiety and more substance use than continuously married persons. Those with more marital losses show worse mental health on all three dimensions than those with fewer. Among those currently widowed, the twice-widowed report significantly more symptoms of anxiety and substance use than the once widowed but those who divorced, remarried and then were widowed do not. However, those who are currently divorced for the second time show

worse mental health than those disrupted for the first time. Barrett concluded that higher-order marriages offer fewer mental health benefits than first marriage. But a second marital loss consists in a first loss plus a second loss. Perhaps each loss does some damage to mental health, with the losses cumulating. Both processes would produce the pattern of results observed. In research under way, Hughes and Waite (2007) found that among those currently married, those with a previous marital loss show more depressive symptoms than those who have been continuously married, although the effects are small.

Financial Well-Being

In much the same way that marital loss leads to declines in physical and emotional health, the same loss leads to declines in assets and wealth. Both widowhood and divorce tend to reduce household income and economies of scale and both often result in sizable expenditures, for health care in the case of widowhood and for the legal process and related expenses in the case of divorce. Both the widowed and divorced have fewer resources for saving than the married. Remarriage reestablishes the flow of earnings and economies of scale but time spent unmarried may leave its mark on assets and wealth.

The cross-sectional evidence aligns well with the argument above; currently married older adults have higher median family incomes, net worth, financial and real assets than those who are widowed, divorced, separated or never married (Lupton and Smith 2003). Currently married adults who have had no marital loss have higher ratios of income to needs, higher net worth and lower poverty rates than those who have ever been divorced or widowed (Holden and Kuo 1996). As might be expected, divorce damages financial well-being more than widowhood, especially among those who do not remarry (Wilmoth and Koso 2002). Those who never marry accumulate less wealth than those who marry and remain married. Remarriage seems to completely make up for the negative effects of divorce or widowhood on financial well-being. As a result, those who divorce or become widowed and do not remarry face the greatest financial disadvantage. This suggests that the economic advantages of marriage accumulate during all the years spent married and

that this accumulation accounts for the better wealth and asset position of the married or remarried. It also suggests that the costs of divorce or widowhood themselves account for very little of the disadvantage faced by the unmarried, since no trace remains for those who remarry. Evidence suggests, as was the case for physical health, that divorce has larger negative economic consequences for women than for men and that this disadvantage lasts until remarriage (Wilmoth and Koso 2002).

Conclusions

Marriage as a social institution seems to protect physical and emotional health and to promote financial well-being. Marriage seems to do this for both men and women, although the mechanisms through which it operates may differ and the advantage of the married over the unmarried seems to be larger for men than for women, especially for physical health and longevity.

At the same time, the end of a marriage through divorce or widowhood is expensive. Resources are spent caring for a spouse in ill health, the benefits of marriage may have been eroded from declines in marital quality and/or the incapacity of the ill spouse and both death and divorce carry out of pocket costs. The newly unmarried face diminished financial, social and emotional resources, which may damage economic, physical and emotional well-being. Remarriage restarts the flow of these resources, allowing for increased investment and, perhaps, repair of damage done and a return to investment.

Although research interest on the consequences of marital history for well-being at older ages is relatively recent, a sizeable amount of careful work has been done. This work paints a picture of damage and disadvantage following divorce, especially for women and especially at relatively young ages, when children are most likely to be present. The reduced financial resources available to single mothers, combined with the strains of single parenting, the conflict that often follows divorce and the loss of the other benefits of marriage seem to damage both the physical and emotional health of divorced women. Divorce seems to lead to some of these disadvantages for men but they appear

to not be as severe and in some arenas, like parenting, men often manage to avoid them altogether. Results to date consistently show that divorce carries substantial long-run costs for the physical health and longevity of women. For men, findings are mixed. Some studies show poorer health and higher risk of mortality for men who have been divorced, some show no effects. It seems likely that the biological and physiological mechanisms through which disadvantage and stress become chronic conditions and death differ for men and women and may depend on when in the life course the divorce occurs, how long the person is unmarried and whether they remarry.

Research on widowhood suggests, although the results are not consistent, that widowhood carries more costs for men than for women, especially for physical health and longevity. Both men and women show declines in emotional well-being, especially in the year or two after their spouse dies. Both men and women whose spouse dies suffer financially but they do so about equally and both benefit equally from remarriage.

Although we are getting a picture of substantial differences in well-being at older ages for those with different experiences of marriage, divorce and widowhood over the life course, much remains to be done. Where results are not consistent, we must investigate the factors that account for the disagreement. Where results are strong, we need to dig deeper to understand *why* and *how* marriage and marital loss affect the way people think, feel, behave, are connected to others and make choices. We need to understand the role of cohabitation and less formal living arrangements and other social institutions in producing well-being in later life.

References

- Amato PR, Booth A (1997) A generation at risk: Growing up in an era of family upheaval. Harvard University Press, Cambridge, Mass
- Amato PR, Rogers SJ (1999) Do attitudes toward divorce affect marital quality? *J Fam Issues* 20:69–86
- Astone NM, McLanahan S (1994) Family structure, residential mobility, and school dropout: A research note. *Demography* 31:575–584
- Bachman JG, Wadsworth HN, O'Malley PM, Johnson LD, Schulenberg JE (1997) Smoking, drinking, and drug use in young adulthood. Lawrence Erlbaum, Mahwah, NJ

- Barrett AE (2000) Marital trajectories and mental health. *J Health Soc Behav* 41:451–464
- Ben-Shlomo Y, Kuh D (2002) A life course approach to chronic disease epidemiology: Conceptual models, empirical challenges and interdisciplinary perspectives. *Int J Epidemiol* 31:285–293
- Booth A, Amato P (1991) Divorce and psychological stress. *J Health Soc Behav* 32:396–407
- Bramlett, MD, Mosher WD (2002) Cohabitation, marriage, divorce and remarriage in the United States. National Center for Health Statistics, Hyattsville, MD
- Brockmann H, Klein T (2004) Love and death in Germany: The marital biography and its effect on mortality. *J Marriage Fam* 66:582–594
- Cacioppo J, Berntson GG (2002) Balancing demands of the internal and external milieu. In: Friedman H, Silver RC (eds) *Oxford handbook of health psychology*. Oxford University Press, New York
- Carr D, House JS, Kessler RC, Nesse RM, Sonnega J, Wortman C (2000) Marital quality and psychological adjustment to widowhood among older adults: A longitudinal analysis. *J Gerontol B Psychol Sci Soc Sci* 55:S197–S207
- Carr DS (2004) Black/white differences in psychological adjustment to spousal loss among older adults. *Res Aging* 26:591–622
- Cherlin A (1978) Remarriage as an incomplete institution. *Am J Sociol* 84:634–650
- Cherlin AJ, Chase-Lansdale L, McRae C (1998) Effects of parental divorce on mental health throughout the life course. *Am Sociol Rev* 63:239–249
- Cohen S, Doyle WJ, Skoner DP, Rabin BS, Gwaltney JM, Jr. (1997) Social ties and susceptibility to the common cold. *J Am Med Assoc* 277:1940–1944
- Cunningham M, Thornton A (2005) The influence of union transitions on white adults attitudes toward cohabitation. *J Marriage Fam* 67:710–720
- DeGarmo DS, Kitson GC (1996) Identity relevance and disruption as predictors of psychological distress for widowed and divorced women. *J Marriage Fam* 58:983–997
- Dupre ME, SO Meadows (2007) Disaggregating the effects of marital trajectories on health. *J Fam Issues* 28:623–652
- Elwert F, Christakis NA (2006) Widowhood and race. *Am Sociol Rev* 71:16–41
- Ensel WM, Kristen Peek M, Lin N, Lai G (1996) Stress in the life course: A life history approach. *J Aging Health* 8:389–416
- Frech A, Williams K (2007) Depression and psychological benefits of entering marriage. *J Health Soc Behav* 48:149–163
- Friedberg L (1998) Did unilateral divorce raise divorce rates? Evidence from panel data. *Am Econ Rev* 88:608–627
- Goldman N, Korenman S, Weinstein R (1995) Marital status and health among the elderly. *Soc Sci Med* 40:1717–1730
- Goodwin JS, Hunt WC, Key CR, Smaet JM (1987) The effect of marital status on stage, treatment, and survival of cancer patients. *J Am Med Assoc* 258:3125–3130
- Gordon HS, Rosenthal GE (1995) Impact of marital status on hospital outcomes: Evidence from an academic medical center. *Arch Intern Med* 155:2465–2471
- Grossbard-Shechtman S (1993) *On the economics of marriage: A theory of marriage, labor and divorce*. Westview Press, Boulder, Colorado
- Grossman M (1972) On the concept of health capital and the demand for health. *J Political Econ* 80:223–255
- Grundy E, Holt G (2000) Adult life experiences and health in early old age in Great Britain. *Soc Sci Med* 51:1061–1074
- Hahn BA (1993) Marital status and women's health: The effect of economic marital acquisitions. *J Marriage Fam* 55:495–504
- Harknett K, McLanahan S (2004) Racial and ethnic differences in marriage after the birth of a child. *Am Sociol Rev* 69:790–811
- Hemström Ö (1996) Is marriage dissolution linked to differences in mortality risks for men and women? *J Marriage Fam* 58:366–378
- Hetherington EM, Kelly J (2003) *For better or for worse: Divorce reconsidered*. Norton, New York
- Hirschl TA, Altobelli J, Rank MR (2003) Does marriage increase the odds of affluence? Exploring the life course probabilities. *J Marriage Fam* 65:927–938
- Holden KC, Kuo HH (1996) Complex marital histories and economic well-being: The continuing legacy of divorce and widowhood as the HRS cohort approaches retirement. *Gerontologist* 36:383–390
- Holden KC, Smock PJ (1991) The economic consequences of marital dissolution. *Annu Rev Sociol* 17:51–78
- Hopper J (1993) The rhetoric of motives in divorce. *J Marriage Fam* 55:801–813
- Horwitz AV, White HR, Howell-White S (1996) Becoming married and mental health: A longitudinal study of a cohort of young adults. *J Marriage Fam* 58:895–907
- Hughes ME, Waite LJ (2007) Marital biography and health at midlife. in Working Paper. Baltimore
- Iwashyna TJ (2001) In sickness and in health: Understanding the effects of marriage on health. Irving B. Harris School of Public Policy, University of Chicago, Chicago, Illinois
- Johnson DR, Wu J (2002) An empirical test of crisis, social selection, and role explanations of the relationship between marital disruption and psychological distress: A pooled time-series analysis of four-wave panel data. *J Marriage Fam* 64:211–224
- Kalmijn M, Monden CWS (2006) Are the negative effects of divorce on psychological well-being dependent on marital quality? *J Marriage Fam* 68:1197–1213
- Kessler RC, McGonagle KA, Zhao S, Nelson CB, Hughes M, Eshleman S, Wittchen HU, Kendler KS (1994) Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the united states. *Arch Gen Psychiatry* 51:8–19
- Kiecolt-Glaser JK, Fisher LD, Ogrocki P, Stout JC, Speicher CE, Glaser R (1987) Marital quality, marital disruption, and immune function. *Psychosom Med* 49:13–34
- Kiecolt-Glaser JK, Glaser R, Cacioppo JT, MacCallum RC, Sundersmith M, Kim C, Malarkey WB (1997) Marital conflict in older adults: Endocrinological and immunological correlates. *Psychosom Med* 59:339–349
- Lee M-A, Carr D (2007) Does the context of spousal loss affect the physical functioning of older widowed persons? A longitudinal analysis. *Res Aging* 29:457–487
- Lichter DT, Graefe DR, Brown JB (2003) Is marriage a panacea? Union formation among economically disadvantaged unwed mothers. *Social Problems* 2003 50:60–86
- Lillard LA, Waite LJ (1995) Til death do us part: Marital disruption and mortality. *Am J Sociol* 100:1131–1156

- Lund R, Holstein BE, Osler M (2004) Marital history from age 15 to 40 years and subsequent 10-year mortality: A longitudinal study of Danish males born in 1953. *Int J Epidemiol* 33:389–397
- Lupton J, Smith JP (2003) Marriage, assets, and savings. In: Grossbard-Shechtman S (ed) *Marriage and the economy*, Cambridge University Press, Cambridge, pp 129–152
- Marks NF, Lambert JD (1998) Marital status continuity and change among young and midlife adults: Longitudinal effects on psychological well-being. *J Fam Issues* 19:652–686
- Mastekaasa A (1995) Marital dissolution and subjective distress: Panel evidence. *Eur Sociol Rev* 11:173–185
- Matouschek N, Rasul I (2008) The economics of the marriage contract: Theories and evidence. *J Law Econ* 51
- Mazur A, Michalek J (1998) Marriage, divorce and male testosterone. *Soc Forces* 77:315–330
- McEwen BS, Stellar E (1993) Stress and the individual. *Arch Intern Med* 153:2093–2101
- McLanahan SS (1983) Family structure and stress: A longitudinal comparison of two-parent and female-headed families. *J Marriage Fam* 45:347–357
- McManus PA, DiPrete TA (2001) Losers and winners: The financial consequences of separation and divorce for men. *Am Sociol Rev* 66:246–268
- Nock S (1998) *Marriage in men's lives*. Oxford University Press, New York
- Peterson RR (1996) A re-evaluation of the economic consequences of divorce. *Am Sociol Rev* 61:528–536
- Pienta AM, Hayward MD, Jenkins KR (2000) Health consequences of marriage for the retirement years. *J Fam Issues* 21:559–586
- Proulx CM, Helms HM, Buehler C (2007) Marital quality and personal well-being: A meta-analysis. *J Marriage Fam* 69:576–593
- Rasul I (2004) The impact of divorce laws on marriage. in *Working Draft*. Graduate School of Business, University of Chicago
- Ross CE (1995) Reconceptualizing marital status as a continuum of social attachment. *J Marriage Fam* 57:129–140
- Ross CE, Mirowsky J, Goldsteen K (1990) The impact of the family on health: Decade in review. *J Marriage Fam* 52:1059–1078
- Sampson RJ, Laub JH (1993) *Crime in the making: Pathways and turning points through life*. Harvard University Press, Cambridge
- Shahar D, Schultz R, Shahar A, Wing RR (2001) The effect of widowhood on weight change, dietary intake and eating behavior in the elderly population. *J Aging Health* 13:189–199
- Simon RW (2002) Revisiting the relationship among gender, marital status, and mental health. *Am J Sociol* 107:1065–1096
- Singer BH, Ryff CD (1999) Hierarchies of life histories and associated health risks. *Ann NY Acad Sci* 896:96–115
- Smock PJ, Manning WD, Gupta S (1999) The effect of marriage and divorce on women's economic well-being. *Am Sociol Rev* 64:794–812
- Tucker JS, Friedman HS, Wingard DL, Schwartz JE (1996) Marital history at midlife as a predictor of longevity: Alternative explanations to the protective effect of marriage. *Health Psychol* 15:94–101
- Turner RJ, Wheaton B, Lloyd DA (1995) The epidemiology of social stress. *Am Sociol Rev* 60:104–125
- Umberson D (1987) Family status and health behaviors: Social control as a dimension of social integration. *J Health Soc Behav* 28:306–319
- Umberson D (1992) Gender, marital status and the social control of health behavior. *Soc Sci Med* 34:907–917
- Umberson D, Chen MD, House JS, Hopkins K, Slaten E (1996) The effect of social relationships on psychological well-being: Are men and women really so different? *Am Sociol Rev* 61:837–857
- Waite LJ, Gallagher M (2000) *The case for marriage: Why married people are happier, healthier and better off financially*. Doubleday, New York
- Waite LJ, Hughes ME (1999) At risk on the cusp of old age: Living arrangements and functional status among black, white, and hispanic adults. *J Gerontol: Soc Sci* 54B:S136–S144
- Wallerstein JS, Blakeslee S (1989) *Second chances: Men, women and children a decade after divorce*. Ticknor & Fields, New York
- Wallerstein JS, Lewis JM, Blakeslee S (2000) *The unexpected legacy of divorce*. Hyperion, New York
- Wickrama KAS, Lorenz FO, Conger RD, Elder GH Jr (1997) Marital quality and physical illness: A latent growth curve analysis. *J Marriage Fam* 59:143–155
- Williams K (2003) Has the future of marriage arrived? A contemporary examination of gender, marriage, and psychological well-being. *J Health Soc Behav* 44:470–487
- Williams K (2004) The transition to widowhood and the social regulation of health: Consequences for health and health risk behavior. *J Gerontol B Psychol Sci Soc Sci* 59:S343–349
- Williams KL, Sassler S, Nicholson LM (2008) For better or for worse? The consequences of marriage and cohabitation for the health and well-being of single mothers. *Social Forces* forthcoming
- Williams K, Umberson D (2004) Marital status, marital transitions, and health: a gendered life course perspective. *J Health Soc Behav* 45:81–98
- Wilmoth J, Koso G (2002) Does marital history matter? Marital status and wealth outcomes among preretirement adults. *J Marriage Fam* 64:254–268
- Zhang Z, Hayward MD (2006) Gender, the marital life course and cardiovascular health in late midlife. *J Marriage Fam* 68:639–657

Chapter 32

Gender, Aging and Widowhood

Deborah Carr and Susan Bodnar-Deren

Introduction

Widowhood is widely regarded as a women's issue. In all developed and nearly all developing nations, women are more likely than men to survive the death of their spouse, reflecting men's higher rates of mortality and the tendency of women to marry men slightly older than themselves. Women also are more likely than men to remain unmarried after their spouse dies, due both to a highly skewed sex ratio among older adults and men's greater desire to remarry after losing a spouse. Moreover, widowhood has increasingly become an *older women's* issue; as life expectancy has increased steadily over the past century in virtually every nation, spousal loss overwhelmingly befalls older adults. As such, widowhood has important consequences for the living arrangements and physical, economic and psychological well-being of older adults. The distinctive ways that older men and women experience widowhood are shaped by demographic factors, including the timing of their spouse's death; the number and gender distribution of their children; the living arrangements, employment patterns and migration patterns of their children; one's own physical health and functioning in later life; cultural context; and gender-typed socialization processes that occur over the life course.

In this chapter, we: (1) document gendered patterns of mortality and spousal loss in developed and devel-

oping nations; (2) describe the marital status and living arrangement patterns of older adults in developed and developing nations; (3) highlight the data needs and analytic tools required for effectively documenting the consequences of spousal loss; (4) discuss the physical and psychological consequences of widowhood for older men and women; and (5) set forth recommendations for future research on gender, aging and widowhood.

Gender and Aging

Gendered Patterns of Mortality

Global population aging is "not gender-neutral" (Mirkin and Weinberger 2001). Women account for the majority of older persons in almost every country in the world. The main reason for this advantage is the gender gap in mortality. Although more boys than girls are born, males have higher mortality rates than females at every stage of the life course, reflecting males' weaker cardiopulmonary systems in infancy and higher levels of risk-taking behavior, including smoking, alcohol consumption and physically strenuous work in adulthood (Verbrugge 1985). As a result, female life expectancy is higher than male life expectancy in nearly every nation, although the magnitude of this gap varies over the life course and across regions.

Life expectancy is a statistical projection of the length of an individual's life. Specifically, it is an estimate of the average number of additional years a person can expect to live if the age-specific death rates for a given year prevail for the rest of his or her life. It is a hypothetical measure because it is based on current death rates, yet actual death rates change over the course of a

D. Carr (✉)
Department of Sociology and Institute for Health
Health Care Policy and Aging Research
Rutgers University
30 College Ave.
New Brunswick, NJ 08901, USA
E-mail: carrds@rci.rutgers.edu

person's life. Consequently, an individual's life expectancy changes as he or she ages. Demographers typically calculate two different life expectancy measures; life expectancy at birth, or the number of years a baby born in a given year can expect to live; and one's life expectancy at age n , or the number of additional years an individual who is n years old can expect to live.

Life expectancy at birth does not simply equal life expectancy at age n plus n additional years of life, because age-specific life expectancy is selective. That is, individuals who have survived the potentially dangerous years of infancy and childhood are more likely to have an extended life span than the average member of their birth cohort. For example, life expectancy at birth for a given cohort may be age 75, yet 75 year olds in that birth cohort can probably expect to live another ten years. Life expectancy at birth is lower than life expectancy at 75, because it includes in its calculations those babies who went on to die during infancy, adolescence, or young adulthood. Youthful deaths are particularly prevalent among men and thus account in large part of their overall life expectancy disadvantage relative to women. As a result, the gender gap in life expectancy at birth is typically much larger than the gender gap in life expectancy at older ages.

Gender differences in life expectancy at birth are presented in Table 32.1 This table shows male and female life expectancy at birth in 34 selected countries, as well as the size of the gap (in years). The average gap between the sexes is roughly seven years, yet this gap ranges from just 1.2 years in India to more than 11 years in Kazakhstan. The gender gap is smallest in developing nations, particularly in South Asian and Middle Eastern societies where cultural factors such as the low social status of women and preference for male offspring contribute to men's relatively higher life expectancy at birth. In some developing nations, particularly parts of Sub-Saharan Africa, maternal mortality rates contribute to women's relatively low life expectancy (Tabolski 2004). By contrast, the large gender gap in Kazakhstan (and elsewhere in the former Soviet Union) is attributed to social upheaval following the demise of the former Soviet Union, where men's (and particularly younger men's) risk of death is heightened by increased homicide and accident rates, excessive alcohol consumption, poor diet and both environmental and workplace degradation (Virganskaya and Dmitriev 1992; Murray and Bobadilla 1997).

The male-female gap in life expectancy at older ages is markedly smaller than the gap at birth, although women's advantage persists. At age 60, the average man in today's world can expect to live another 17 years while the average woman can expect to survive for 21 more years. As revealed in Table 32.2, the gender gap is smaller in less developed regions and averages roughly two years (versus four years in more developed regions). The gender gap at age 60 is considerably smaller than at earlier life course stages because it is not skewed by youthful male deaths; moreover, men who manage to withstand the adversities of early life and survive until age 60 may be particularly hardy (Kobasa 1979–1993). Demographers predict that the gender gap may increase in future decades. Processes of urbanization and modernization in many developing countries are accompanied by increases in alcohol and tobacco use, as well as vehicular and industrial accidents – each of which affects men more often than women (Kinsella and Velkoff 2001). Additionally, as the educational and literacy gap between men and women erodes in developing nations, women are expected to enjoy further strides in health and life expectancy, as education is a powerful predictor of health status and survival (Liu et al. 1998).

Sex Ratios in Later Life

As a consequence of the gender gap in infant, child and young adult mortality rates, women usually begin to outnumber men by ages 30–40 and the sex ratio becomes increasingly imbalanced as individuals age (Tabolski 2004). A sex ratio is a common measure that captures a population's gender composition; it is conventionally measured as the number of men per 100 women in a given population or age category. Ratios greater than 100 indicate more men than women, whereas ratios under 100 indicate more women than men in a given population. Although sex ratios typically reflect gender differences in life expectancy due to biological aging, historical shocks such as wars, mass migrations, or epidemics that disproportionately affect one gender also may contribute. Developed countries tend to have lower sex ratios at older ages than developing countries, yet in nearly every nation women outnumber men. In the year 2000, the global sex ratio for the population age 60 and older was 81 males per 100 females. Thus, there were approximately 63 million

Table 32.1 Life expectancy at birth in selected countries by gender, 2000

	Men	Women	Gender gap (years)
DEVELOPED COUNTRIES			
Western Europe			
Austria	74.5	81.0	6.5
Belgium	74.5	81.3	6.8
Denmark	74.0	79.3	5.3
France	74.9	82.9	8.0
Germany	74.3	80.8	6.5
Norway	75.7	81.8	6.1
Sweden	77.0	82.4	5.4
United Kingdom	75.0	80.5	5.5
Southern and Eastern Europe			
Czech Republic	71.0	78.2	7.2
Greece	75.9	81.2	5.3
Hungary	67.0	76.1	9.1
Italy	75.9	82.4	6.5
Spain	75.3	82.5	7.2
Other			
Australia	76.9	82.7	5.8
Japan	77.5	84.1	6.6
United States	74.2	79.9	5.7
DEVELOPING COUNTRIES			
Africa			
Egypt	61.3	65.5	4.2
Ghana	56.1	58.8	2.7
Mali	45.5	47.9	2.4
South Africa	50.4	51.8	1.4
Uganda	42.2	43.7	1.5
Congo (Brazzaville)	44.5	50.5	6.0
Asia			
China	69.6	73.3	3.7
India	61.9	63.1	1.2
Kazakhstan	57.7	68.9	11.2
South Korea	70.8	78.5	7.7
Syria	67.4	69.6	2.2
Thailand	65.3	72.0	6.7
Latin America			
Argentina	71.7	78.6	6.9
Brazil	58.5	67.6	9.1
Costa Rica	73.3	78.5	5.2
Chile	72.4	79.2	6.8
Mexico	68.5	74.7	6.2
Venezuela	70.1	76.3	6.2

Sources: Kinsella, and Velkoff (2001). U.S. Census Bureau, Series P95/01-1, An Aging World: 2001. Washington, D. C. U.S. Government Printing Office.

Table 32.2 Life expectancy at age 60 for men and women and the gender gap in life expectancy, projections for period 2005–2010

	Men	Women	Gender gap (years)
World	17	21	4
More Developed Regions	19	23	4
Less Developed Regions	17	19	2
Least Developed Regions	15	17	2
Africa	15	17	2
Asia	17	20	3
Europe	18	22	4
Latin America/Caribbean	19	22	3
North America	20	24	4
Oceania	20	24	4

Sources: *Living Arrangements of Older Persons. World Population Prospects: The 2004 Revision* (ST/ESA/SER.A/244) and *Living Arrangements of Older Persons around the World* (STE/ESA/SER.A/240).

Note: *More developed regions* comprise all regions of Europe, plus Northern America, Australia/New Zealand and Japan. *Less developed regions* comprise all regions in Africa, Asia (excluding Japan), Latin America and the Caribbean plus Melanesia, Micronesia and Polynesia. *Least developed regions* include 50 countries: Afghanistan, Angola, Bangladesh, Benin, Bhutan, Burkina Faso, Burundi, Cambodia, Cape Verde, Central African Republic, Chad, Comoros, Democratic Republic of the Congo, Democratic Republic of Timor-Leste, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Haiti, Kiribati, Lao People's Democratic Republic, Lesotho, Liberia, Madagascar, Malawi, Maldives, Mali, Mauritania, Mozambique, Myanmar, Nepal, Niger, Rwanda, Samoa, São Tomé and Príncipe, Senegal, Sierra Leone, Solomon Islands, Somalia, Sudan, Togo, Tuvalu, Uganda, United Republic of Tanzania, Vanuatu, Yemen and Zambia. These countries are also included in the less developed regions.

more women ages 60 and older than there were men of the same age (United Nations 2005a).

Table 32.3 presents sex ratios at ages 60 and 80, by region. In more developed regions, the sex ratio at ages 60 and older and 80 and older are 72 and 46 respectively, meaning that there are 1.4 women for every man age 60 and older and 2.2 women for every man age 80 and older. The sex ratios are most skewed in Eastern and Western Europe, reflecting long-term consequences of heavy war losses during World War II. Women account for 80 per cent of the oldest old (aged 80 and older) in Russia and 74 per cent in Germany (Kinsella and Velkoff 2001).

In developing nations, by contrast, the sex ratios are considerably higher; in Eastern and South Central Asia, sex ratios approach 90 for persons ages 60 and older. In part, this reflects the more modest gender gap in life expectancy, described above. These aggregate statistics may also reflect distinctive patterns of discrimination against girls and women in certain nations, including insufficient investment in women's education, reproductive health and nutrition over the life course (Mason 1993; Presser and Sen 2000). The U. S. Census Bureau has identified 18 nations in Asia and Africa where older men outnumber older women (see Table 32.4).

Caution should be taken in presuming that these ratios necessarily reflect women's disadvantaged life

expectancy, however; these patterns may be statistical artifacts. Older women may be undercounted to a greater degree than men in some national censuses, in cases where male householders fail to tell census enumerators about all household members (particularly older women). Patterns of male labor migration also may affect these ratios, if male migrants remain in their host countries after reaching age 65 (Kinsella and Velkoff 2001). This explanation is particularly appropriate for countries like Qatar, United Arab Emirates and Kuwait, which rely heavily on male migrant workers in the oil industry.

Family and Household Characteristics of Older Men and Women

Marital Status in Later Life

Because of men's lower life expectancy, women are more likely than men to lose a spouse to death. Widows are far less likely than widowers to remarry because of the dearth of opposite sex peers, as evidenced by the skewed gender ratios described above. Addition-

Table 32.3 Sex ratio (number of men per 100 women) for individuals age 60 and older and age 80 and older, 2004

Major area or region	Aged 60+	Aged 80+
World	82	55
More developed regions	72	46
Less developed regions	88	66
Least developed regions	85	73
Africa	83	67
Eastern	83	69
Middle	80	64
Northern	85	70
Southern	70	42
Western	87	73
Asia	88	63
Eastern	88	54
South-eastern	84	70
South-central	90	81
Western	85	66
Europe	69	43
Eastern	57	33
Northern	78	50
Southern	76	52
Western	75	42
Latin America and the Caribbean	82	66
Caribbean	86	74
Central America	85	72
South America	80	63
North America	78	54
Oceania	87	59

Sources: *Living Arrangements of Older Persons. World Population Prospects: The 2004 Revision* (ST/ESA/SER.A/244) and *Living Arrangements of Older Persons around the World* (ST/ESA/SER.A/240).

Note: See Table 32.1 for descriptions of more, less and least developed regions.

ally, cultural norms encourage men to marry women younger than themselves, so widowed men may opt to remarry a peer or a younger woman, whereas older widows do not typically have access to a similarly expanded pool of potential spouses (Cattell 1997; Velkoff and Kinsella 1993). Consequently, in every nation a significantly higher proportion of women than men are widowed and a higher proportion of men than women are married. Recent evidence also suggests that women in contemporary western nations have a weaker desire to remarry; they may prefer to have serious dating relationships such as “Living Apart Together” (Karlsson and Borell 2002) but may not

want to enter a formal union and take on the home-making and caregiving chores that often accompany marriage. Although the proportion of older adults that is widowed increases steadily with age, the pace of the increase is much steeper for women than men.

The U.S. Census Bureau compiled data on the marital statuses of men and women in 51 nations; Table 32.5 shows the proportion of older men and women who are currently widowed, by nation and region. At each of the three life course stages (ages 55–64, ages 65 and older and ages 70 and older), a much larger proportion of women than men is widowed. Among men ages 55–64, just 3–6 per cent are widowed in most countries, although these proportions are higher in a handful of Asian nations. In India, nearly 12 per cent of men ages 55–64 are widowed; the proportion is slightly above 10 per cent in China. These proportions increase steadily with age for men but at no point do they converge with widowhood rates for same-age women. Among persons age 65 and older, anywhere from 10 to 23 per cent of men are widowed. Again, the exception is India, where 30 per cent of men in that age range are widowed.

These numbers are in stark contrast with the proportion widowed among women. The proportion of 55–64 year-old women who are widowed varies widely, from 13 per cent in the United States and Japan, to more than 40 per cent in North Africa (Morocco and Egypt) and more than 50 per cent in Bangladesh. The proportion of women in this age category who are widowed is roughly three times of that for men. Among women ages 65 and older, the proportion widowed ranges from 45 to 60 per cent in most nations. Several of the Latin American and Caribbean nations have considerably lower rates (e.g., 32 per cent in Jamaica and 39 per cent in Costa Rica) yet these low rates may reflect the fact that non-marital consensual unions are prevalent there so the proportion at risk of being widowed is relatively small. Proportions are considerably higher in North Africa and the Ukraine, where roughly two-in-three women ages 65 and older are widowed. Again, these proportions are roughly two to three times as high as for men in the same age range.

Gender differences in marital status shape the residential experiences of older adults. In developed nations, older women are more likely than their male peers to live alone or to reside in non-family institutions such as nursing homes or assisted living facili-

Table 32.4 Sex ratios for population aged 65 and older for countries with more elderly men than women, 2000

Country	Sex ratio
Qatar	243
United Arab Emirates	226
Kuwait	182
Sudan	133
Bangladesh	119
Saudi Arabia	118
Taiwan	113
Iran	112
Afghanistan	112
Niger	111
Oman	111
Gambia	111
Eritrea	104
Yemen	104
Bahrain	104
Bhutan	103
India	103
Tunisia	101

Source: U. S. Census Bureau, 2000.

ties. Men, by contrast, are more likely to reside in married couple households. In developing nations, women are more likely than men to reside with their adult children— although patterns of modernization and migration have recently begun to chip away at this traditional arrangement. The proportions of older adults living either alone, with children, or in an institution varies widely by region and cultural context, yet the gender gap persists.

Living Alone in Later Life

An estimated 90 million older adults – or one of out seven – live alone worldwide, roughly 60 million of whom are women. Approximately one in five older women lives alone, which is more than twice the proportion of men who do so (United Nations 2005b). Table 32.6 shows the proportion of persons ages 60 and older who live alone, by gender. In every region a higher proportion of women than men live alone, reflecting women’s tendency to be widowed and men’s tendency to be married in later life. The proportion of older men who live alone ranges from just 2 per cent in South Central Asia to 15 per cent in Western Europe.

Among older women, these figures range from 6 per cent in South Central Asia to 43 per cent in Western Europe. Thus, women are more likely than men to live alone, across all regions and cultures.

Perhaps the starkest divide in living arrangements is Asia versus North and Central Europe. Just 9 per cent of women live alone in Asia, whereas roughly half of all older women in Denmark, Germany and Sweden reside alone. The latter proportion increases gradually with advancing age, yet declines among the oldest old, due to factors such as declining health, lack of financial resources, difficulties in performing tasks of daily living and maintaining an independent residence and the need for on-site nursing or medical care. In Western Europe and, to a lesser extent, North America, older adults are moving into communal living arrangements (i.e., households with two or more older adults) as well as residential care facilities.

Residence in Institutions

Globally, a very small proportion of older adults reside in institutions, although these proportions vary widely by region and gender. Rates of institutionalization range from 1 to 10 per cent in developed nations and less than 1 per cent in most developed nations. In the 1990s, more than 8 per cent of older adults in the Netherlands and Sweden resided in residential care facilities, while 5–6 per cent of older persons in Japan, the United States and the United Kingdom did so (OECD 1996; Jacobzone 1999). The proportion increases steadily with age, so that persons ages 75 and older are two to 10 times more likely than persons ages 65–74 to reside in an institution.

The gender gap in institutionalization emerges only among the oldest old. For example, in Canada in the 1990s, 2 per cent of both men and women ages 60–74 resided in institutions, yet among persons ages 75 and older, these figures were 11 and 19 per cent respectively. The late life gender gap reflects gender differences in marital status and life expectancy. Older men are more likely to be married and thus reside with their wives in later life, relying on their wives for care. Women are more likely than men to survive into the very oldest age groups and thus have a greater need for formal care. Because the need for care increases with age and

Table 32.5 Proportion widowed by age and gender, selected countries and regions: selected years

	Men			Women		
	55–64	65+	Oldest-old	55–64	65+	Oldest-old
North America/Oceania						
Australia (1991)	3.2	13.6		14.1	45.8	
Canada (1991)	2.9	12.9	22.1 ^a	13.9	46.6	64.0 ^a
New Zealand (1991)	4.0	16.1	21.0 ^c	15.3	49.5	58.2 ^c
United States (1995)	2.8	13.5	21.7 ^a	12.9	47.3	64.9 ^a
Western Europe						
Austria (1991)	4.0	16.3	35.4 ^b	18.8	54.4	75.4 ^b
Belgium (1995)	3.9	16.4	30.1 ^a	14.3	49.9	68.9 ^a
Denmark (1991)	4.3	17.9	36.9 ^b	15.2	48.6	69.7 ^b
France (1991)	3.6	15.1	33.3 ^b	16.8	51.3	73.6 ^b
Germany (1991)	3.8	17.7	39.1 ^b	16.8	56.1	77.4 ^b
Greece (1991)	2.4	13.8	31.5 ^b	16.6	51.3	74.5 ^b
Italy (1991)	3.2	14.7	25.1 ^a	17.4	50.3	65.6 ^a
Luxembourg (1991)	4.5	18.2	40.0 ^b	18.4	55.2	75.6 ^b
Norway (1990)	3.3	15.3	26.0 ^a	14.8	45.8	60.3 ^a
Sweden (1991)	2.9	14.7	32.5 ^b	11.5	43.6	66.2 ^b
United Kingdom (1991)	3.9	18.0	37.9 ^b	14.8	49.4	70.8 ^b
Eastern Europe						
Bulgaria (1985)	4.7	23.2	39.2 ^a	19.2	53.2	70.2 ^a
Czech Republic (1991)	4.4	19.2	44.0 ^b	23.3	60.8	82.8 ^b
Hungary (1990)	5.5	19.4	31.5 ^a	25.0	60.2	75.5 ^a
Poland (1990)	4.8	18.0	29.4 ^a	23.7	59.3	74.1 ^a
Russia (1994)	5.4	16.1	22.9 ^c	24.6	57.7	68.6 ^c
Ukraine (1989)	5.0	18.6	24.3 ^c	25.8	65.3	75.4 ^c
Africa						
Egypt (1986)	5.1	14.3		41.1	67.0	
Liberia (1984)	5.3	11.2	14.2 ^a	25.5	46.2	53.9 ^a
Malawi (1987)	2.5	7.8		23.8	47.2	
Morocco (1982)	2.9	9.5	14.4 ^a	41.2	71.1	81.1 ^a
Tunisia (1984)	3.1	10.9	18.2 ^a	30.9	61.8	76.3 ^a
Zimbabwe (1992)	3.2	9.0	13.9 ^a	31.2	61.1	73.2 ^a
Asia						
Bangladesh (1981)	3.8	10.6		52.4	72.2	
China (1990)	10.4	30.0		22.6	62.3	
India (1981)	11.7	23.3		44.5	70.3	
Indonesia (1990)	6.0	14.3	22.3 ^a	38.5	65.5	76.2 ^a
Israel (1983)	3.1	14.6	24.3 ^a	21.0	53.3	71.2 ^a
Japan (1995)	3.0	12.4	22.1 ^a	13.0	50.1	73.1 ^a
Malaysia (1991)	5.1	15.9	24.8 ^a	29.6	58.4	70.2 ^a
Pakistan (1981)	5.6	11.7		18.2	47.5	
Philippines (1990)	6.9	18.3	28.0 ^a	24.0	48.2	61.8 ^a
Singapore (1990)	6.1	20.2	25.5 ^c	28.9	61.8	68.5 ^a
South Korea (1995)	4.7	15.8	28.1 ^a	33.1	73.0	88.3 ^a
Sri Lanka (1981)	5.3	14.4		27.3	50.1	
Thailand (1990)	7.9	20.4	25.1 ^c	27.0	56.1	63.9 ^c
Turkey (1990)	3.4	15.9		23.1	54.6	

Table 32.5 (continued)

	Men			Women		
	55–64	65+	Oldest-old	55–64	65+	Oldest-old
Latin America/Caribbean						
Argentina (1991)	5.1	15.4	24.7 ^a	22.4	54.1	69.6 ^a
Brazil (1980)	4.9	15.8		25.8	54.9	
Chile (1992)	5.1	16.7	25.7 ^a	19.1	46.8	60.2 ^a
Colombia (1985)	4.2	12.9		21.1	43.8	
Costa Rica (1984)	3.5	14.5		15.2	39.2	
Guatemala (1990)	5.1	16.0		28.2	52.8	
Jamaica (1982)	4.1	12.7		14.5	32.0	
Mexico (1990)	4.7	15.0		19.8	43.4	
Peru (1981)	8.1	20.4		23.7	49.6	
Uruguay (1985)	3.6	13.6	22.9 ^a	20.3	50.4	64.2 ^a

Source: Table 7, from Kinsella and Velkoff, 2001. Among the oldest-old, the specific age groups examined vary by nation where, a represents 75 and older; b represents 80 and older; c represents 70 and older.

because women are over-represented among the oldest old, women comprise the majority of the institutionalized older population (Velkoff and Lawson 1998).

The primary reason for the very low levels of institutionalization is that family members provide the bulk of care to older adults who cannot care for themselves. Thus, the overall institutionalization rate is shaped by the number of kin available to provide care. Given declining birth rates throughout the world and increasing numbers of women entering the paid labor market (thus increasing the opportunity costs of providing unpaid care), demographers project that the supply of potential family caregivers will shrink in future decades (Kinsella 1996).

Coresidence with Children and Grandchildren

The most common living arrangement for older adults in nearly all developing nations is coresidence with children or grandchildren. Parent-child coresidence has traditionally been viewed as a practice consistent with norms of filial piety. In Africa and Asia, roughly 75 per cent of older adults coreside with children or grandchildren, while the proportion is 62 per cent in Latin America and the Caribbean. By contrast, just 17 and 25 per cent of older persons in the United States and Europe live with their children, respectively (United Nations 2005b). Women are far more likely

than men to coreside with their children, as men are more likely to remain married in later life and thus reside independently with their wives.

Although older adults' coresidence with children and grandchildren is typically conceptualized as an arrangement that benefits the older generation, persuasive evidence reveals that the flow of support is often reciprocal (Chan 1997; Knodel and Chayovan 1997). Older adults – particularly women – provide care to their coresidential grandchildren and contribute to household chores. Divorce, drug addiction, HIV/AIDS and global migration of young adults have created a situation where older women may reside with their grandchildren only, while their children reside elsewhere. Referred to as “skip generation households,” these arrangements are common in Latin American, Afro-Caribbean and African nations (Sennott-Miller 1989). More than 10 per cent of older women in most of Sub-Saharan Africa and Latin America live in “skip generation” households and this proportion climbs as high as 30–35 per cent among older women in Malawi, Rwanda and Zimbabwe (United Nations 2005b).

The AIDS epidemic has contributed to a significant increase in the number of “skip generation” families in Sub-Saharan Africa. An estimated seven per cent of the Sub-Saharan population is infected with HIV/AIDS, with an estimated 25 million children and adults living with HIV (UNAIDS 2006). The high infection levels among persons age 15–49 result in many children needing care; an estimated 15 million children have lost one or both of their parents as a result of the disease and

Table 32.6 Proportion of persons age 60 and older who live alone: estimates for the world, major areas and regions by sex

Major area or region	Men	Women
World	8	19
More developed regions	13	32
Less developed regions	5	9
Least developed regions	4	8
Africa	6	11
Eastern	6	13
Middle	8	12
Northern	4	12
Southern	8	8
Western	5	10
Asia	5	9
Eastern	7	11
South-eastern	3	9
South-central	2	6
Western	5	14
Europe	13	35
Eastern	11	31
Northern	21	44
Southern	9	26
Western	15	43
Latin America and the Caribbean	7	10
Caribbean	10	9
Central America	7	9
South America	7	11
North America	15	34
Oceania	16	34

Sources: *Living Arrangements of Older Persons. World Population Prospects: The 2004 Revision* (ST/ESA/SER.A/244) and *Living Arrangements of Older Persons around the World* (STE/ESA/SER.A/240).

Note: See Table 32.1 for descriptions of more, less and least developed regions.

the care of these children is typically shouldered by their grandmothers (Velkoff and Lawson 1998). One study in Kinshasa, Democratic Republic of the Congo (formerly Zaire) found that the principal guardian for 35 per cent of AIDS orphans was a grandparent (Ryder et al. 1994).

Social scientists predict that traditional multigeneration living arrangements may become less prevalent in coming decades, due to the forces of modernization and urbanization (e.g. Zhou 2000). Modernization is the transformation of a society from a rural one with limited technology and traditional values, toward an urban way of life based on scientific technology, highly differentiated institutions, clearly defined individualized roles and a cosmopolitan outlook that emphasizes efficiency (Cowgill 1979). As levels of income and education rise, older adults may develop preferences

(and have the means) for independent living and their children may migrate toward urban areas to find more desirable work opportunities – leaving their aged parents to reside on their own (United Nations 2005b). Additionally, declining birth rates through much of the world mean that older adults have fewer children with whom to share a residence. Research on Latin America documents that countries at later stages of the demographic transition have larger proportions of older adults living alone than do countries at earlier stages of transitions. Data from the Survey on Health and Well-Being of Elders (SABE), a cross-sectional study of community-dwelling older adults in seven major urban areas in Latin America and the Caribbean, shows that Argentina and Uruguay have undergone steeper and more rapid fertility declines than Cuba, Chile, Brazil and Mexico; the former two countries have substan-

tially lower rates of parent-child coresidence than the latter (Glaser et al. 2006).

To date, demographers have only limited evidence of a widespread move away from parent-child coresidence. One study of shifting patterns of living arrangements in Japan shows that the proportion of older adults living with kin has declined while the proportion living alone has increased over the past five decades (Atoh 1998). Kamo (1988) and others have argued that industrialization has been accompanied by an erosion of the social status of Japanese elders. At the same time, however, modernization has contributed to the economic and physical well-being of older adults, thus enabling them to maintain independent residences that are proximate to their children's. Japanese older adults are thus able to maintain the desirable status of "intimacy at a distance" (Steinhouwer 1968; Rowland 1991), reflecting normative changes towards individualism and personal independence (Gierveld 2001).

However, in poorer developing nations, independent living is often a default category rather than a desired state among older adults. The migration of adult children from rural villages to urban regions creates a context where older persons are responsible for their own economic and residential well-being, with many continuing to work in arduous agricultural jobs. For example, as a result of large-scale rural to urban migration among young and working-age persons in Zambia throughout the late 20th century, older adults were left to live on their own and often struggled financially as a result. Apt (2001) observed that "the elderly are left behind in rural areas to eke out a living from the land with very limited tools."

Similar patterns have been observed in China, where older widowed women, often left behind in rural villages when their children migrate to larger cities, take jobs in the cash economy. In one recent high visibility case, a 60-year-old widow successfully sued her son and daughter for abandonment. She had lived with her son following the death of her husband but her son subsequently asked her to leave his home and her daughter refused to take her in. The widow sued and the courts ruled that she was allowed to live with her daughter and obliged her son to pay her monthly support (French 2006). This specific case highlights the ways that gender, marital status and cultural and economic context shape the experiences of older adults.

Methodological Concerns in Studying Gender, Aging and Widowhood

We have documented the ways that patterns of mortality, fertility and migration affect the marital status and living arrangements of older men and women. Before discussing the ways that gender and widowhood affect the physical, emotional and financial well-being of older adults, we provide an overview of the methodological issues that social scientists must consider when exploring the individual-level consequences of spousal loss and gender differences therein.

Research Design and Samples

Clinical Samples

The data and methods available for studying the consequences of widowhood have undergone important advances in recent decades. Early studies in North America and Europe of the physical and psychological consequences of loss typically drew subjects from patient populations, usually of persons seeing psychiatric treatment (Parkes 1965). Researchers rarely used control groups; when used, they often included nonbereaved patients seeking treatment (Hyman 1983). Several recent studies have drawn subjects from clinical populations (Arbuckle and deVries 1995) and participants in self-help groups (Silverman 1986; Wheeler 2001), yet findings from these studies cannot be generalized to broader populations of widows and widowers. By definition, patient and self-help samples include those already seeking help, thus findings based on these data may overstate the negative consequences of loss because persons with the most difficult readjustments are over-represented in help-seeking samples.

Widowed-Only Samples

Data from community-based samples of widowed persons only (e.g., Berardo 1970; Lopata 1973) afford researchers greater generalizability than help-seeking samples, yet they do not allow for the systematic evaluation of the *consequences* of spousal loss because they do not include married persons as a comparison group.

For example, studies may reveal that widows have higher rates of depression than widowers, yet this gap may reflect gender differences in psychological health in general, given that women are more susceptible to depression than men. Thus, in order to ascertain the consequences of spousal loss, researchers cannot simply compare widows and widowers. Rather, they must examine the direct effects of both widowhood status and gender on some outcome, as well as the combined (or interaction) effects of the two.

Cross-Sectional Population Surveys

Large sample surveys that obtain information on marital status, physical health, living arrangements, economic resources and psychological well-being offer a potentially rich resource for comparing the experiences of widowed and married persons. Empirical findings based on such large-scale sample surveys are more generalizable than findings from clinical or help-seeking samples and they allow for comparisons between bereaved and non-bereaved persons. However, cross-sectional data pose important obstacles to establishing causal influences, as these data sources capture a single point in time rather than multiple observations over an extended time period. Thus, researchers cannot ascertain whether the differences observed between widowed and married persons are attributable to the event of spousal loss, or to differences that existed prior to the loss. That is, cross-sectional data cannot resolve whether an observed statistical association reflects causation, correlation, or a spurious relationship (see Dohrenwend, Levav, and Shrout 1992 for a review).

Prospective and Longitudinal Studies

Prospective and longitudinal studies are vastly superior to cross-sectional studies in terms of establishing causation. Under a quasi-experimental prospective design, data collection begins prior to the time that an individual experiences a critical event or transition, such as widowhood. Subjects are then tracked over time and persons who eventually experience the transition are then matched with a “control” person (i.e., still-married person) who participated in the pre-event interview and who shares important pre-event characteristics. This design was used in the Changing Lives

of Older Couples (CLOC) study, a study of late-life spousal loss among a sample of roughly 1,500 older Americans residing in the Detroit, Michigan area (see Carr, Nesse, and Wortman 2006).

Quasi-experimental designs are considered one of the most effective methods for establishing causation in studies where the key independent variable (such as “becoming widowed”) cannot be randomly assigned. Moreover, the prospective design enables researchers to obtain timely measures of important pre loss characteristics. For example, cross-sectional studies may ask respondents to recall events, conditions and personal characteristics from the distant past. However, such reports may be subject to retrospective recall bias; this is a particularly serious concern when studying older adults. Errors in recalling past experiences increase with age; the longer the recall period, the less reliable are the retrospective reports (Dex 1995). Age-related cognitive and physical impairments also may increase recall errors (Schwarz et al. 1999). These reporting biases may be particularly problematic in samples of bereaved persons; widowed persons have been found to “sanctify” their late spouse and late marriage and tend to offer overly positive retrospective assessments of both (Lopata 1973). Prospective studies like the CLOC, by contrast, assess traits of one’s spouse and marriage prior to the widowhood transition.

Longitudinal studies, studies that track individuals over time and obtain data at multiple time points, also offer important advantages to bereavement researchers. First, longitudinal studies are superior to cross-sectional studies in revealing causal influences because they can better pinpoint the temporal ordering of events and experiences (Alwin and Campbell 2001). Multiple data points are particularly important when exploring the consequences of stressful events such as widowhood. Widowhood is typically conceptualized as a discrete, observable event believed to trigger significant life changes (Holmes and Rahe 1967). However, most discrete events take time to come to fruition and often occur after a long period of prior stress (Avison and Turner 1988; Wheaton 1999). For example, widowhood may occur at the end of a long and difficult period of caregiving, or following a period of warfare or famine.

Second, longitudinal studies enable researchers to study change over time. The development of new statistical methods in recent years, including latent growth curve modeling, provides tools for analyzing longitudinal data and thus enables researchers to directly eval-

uate claims about the duration, course and patterns of health and economic change. Third, longitudinal studies that span extensive time periods allow researchers to document the long-term consequences of widowhood, particularly for those outcomes that may not occur until several years after the transition. Despite these strengths, longitudinal studies have several limitations. The costs of collecting data at multiple time points can be prohibitive. Moreover, attrition – or the loss of subjects over the course of the study – may bias the study findings if the subjects who are lost shared relevant characteristics (Moss et al. 2001). Selective attrition is particularly problematic in studies of older populations; older, less healthy, less financially secure and more residentially mobile persons are the most likely to drop out of multiwave studies. Thus, the attrition of persons with the fewest protective resources may lead researchers to underestimate the potentially harmful consequences of spousal loss if those who are the least well drop out of the study due to poor health or death. Researchers should thus take appropriate steps to identify and acknowledge both the sources and possible consequences of sample attrition in studies of older widows and widowers. More sophisticated strategies, such as weighting adjustments, imputation (Little and Rubin 1987; Little and Schenker 1995) and the estimation of two-stage selection models (e.g., Heckman 1979; Heckman and Singer 1984) also are effective ways to address such concerns.

Analytic Concerns

Researchers seeking to identify the consequences of spousal bereavement face two important analytic concerns: the time-dependence of such consequences and selection both into and out of widowhood. First, the economic, physical and psychological consequences of spousal loss are conditional upon the time since loss. The effects of bereavement may be masked in heterogeneous samples that include both recent and long-time widowed persons. Moreover, the lack of attention to time since loss may lead to an inaccurate portrayal of gender differences in bereavement. On average, men are widowed for shorter time periods than women, because they are more likely to exit the “widowed” state via either remarriage or mortality (Lee et al. 2001). At any given time, a higher proportion of

widowers than widows are recently bereaved and the recently bereaved tend to have poorer outcomes.

Second, a common strategy for examining the effects of widowhood is to compare bereaved and married persons in a cross-sectional sample and then to assume that the data from married respondents can be used to represent the behaviors, experiences and attitudes of widows and widowers prior to their loss (Ferraro and Barresi 1982). The assumption that married and widowed persons are similar on important attributes is problematic, however, because both *becoming widowed* and *remaining widowed* are selective processes. Not all persons are equally likely to become (or remain) widowed and the factors that increase one’s risk of becoming widowed may also increase one’s susceptibility to economic strain, compromised physical health, psychological distress, or high-risk health behaviors. For example, persons with limited economic resources are more likely to die prematurely than wealthier persons (McDonough et al. 1999; Preston and Taubman 1994). Given that the survivors of these early decedents shared their spouses’ disadvantaged socioeconomic position, they are more likely to experience economic deprivation (and the accompanying physical and psychological strains) even in the absence of becoming widowed (Dohrenwend et al. 1992). That is, the observed statistical relationship between spousal loss and the survivor’s economic status may be spurious rather than causal.

Just as *becoming widowed* is a selective process, *exiting widowhood* via either remarriage or one’s own death also is a selective transition. Persons who remain widowed for the longest durations (and thus are most likely to be identified as “currently widowed” in a cross-sectional survey) may differ significantly from those who have exited the “widowed” category. The healthiest, wealthiest and happiest bereaved spouses are the most likely to remarry (Mastekaasa 1992; Peters and Liefbroer 1997). Cross-sectional studies that compare currently widowed persons with currently married persons may *overstate* the deleterious consequences of loss; the average well-being of persons remaining widowed is lower than for those who “exit” the widowed state via remarriage. In contrast, the least well-off widowed persons have an elevated risk of mortality (e.g., Preston and Taubman 1994). As a result, studies that compare widowed and married persons also may *understate* the harmful consequences of loss; the average well-being of persons who survive is higher than for those persons who die during

the study period. Whether the effects of widowhood are over- or under-stated in a given study may reflect the composition of the study sample. For example, if a high proportion of sample members remarry (e.g., a sample including many young widowers), then the deleterious consequences may be overstated. Conversely, if many sample members die shortly after loss (e.g., a sample including many older or ill persons), then the harmful consequences may be understated.

Measurement Issues

Research on gender differences in the experience of spousal loss focuses overwhelmingly on psychological adjustment to loss (see Wolff and Wortman 2006 for a review). This emphasis is consistent with the widely acknowledged assumption that widowhood is among the most stressful of all life events and has important psychological ramifications (Holmes and Rahe 1967). However, researchers may develop a more thorough understanding of how older adults adjust to loss by considering a fuller range of social, economic and behavioral outcomes, including social engagement and participation (Utz et al. 2002), social support from family and friends (Ha et al. 2005), physical health (Wilcox et al. 2003), strategies for managing daily activities (Umberson et al. 1992) and personal growth in the face of loss (Carr 2004).

The importance of focusing on multiple outcomes has been elaborated elsewhere (e.g., Aneshensel, Rutter, and Lachenbruch 1991; Horwitz 2002). The main reasons for considering multiple outcomes are: (a) to identify the *diverse array of consequences* that widowhood may have for older adults; (b) to identify important *subgroup and cross-cultural differences* in how newly bereaved persons respond to loss; and (c) to recognize that commonly used global measures of adjustment may mask more *specific* adjustments to loss.

As noted earlier, most bereavement research focuses on negative mental health indicators and psychiatric complications including depressive symptoms, major depressive disorders (MDD), anxiety-related disorders such as post-traumatic stress disorder (PTSD) and grief (e.g., Bruce et al. 1990; Stroebe et al. 1993; Zisook et al. 1997). The two most commonly used outcomes are depression and grief. Depression is typically mea-

sured as either a categorical variable signifying that one has experienced a two-week spell of depressed mood and somatic and behavioral symptoms in the year prior to interview, or with a continuous measure of depressive symptoms such as the Center for Epidemiologic Studies Depression (CES-D) scale (Radloff 1977). Typically, grief is measured either as an overarching scale that may comprise more specific symptom subscales (e.g., Jacobs et al. 1986), or as a categorical indicator of a specific “type” of grief, such as “complicated” grief (Barry et al. 2002; Prigerson et al. 1995), or “traumatic” grief (Prigerson and Jacobs 2001; Prigerson et al. 1999).

On one hand, this emphasis on negative aspects of psychological adjustment and the presence or absence of pathology is justifiable. Distress and depression are relatively common reactions to loss; most studies find that 15–30 per cent of older bereaved spouses experience clinically significant depression in the year following their spouse’s death (e.g., Stroebe et al. 1993). The widespread emphasis on dichotomous outcomes (i.e., presence or absence of a diagnosis) is also consistent with medical and psychiatric practices in the United States and elsewhere (Horwitz 2002). Psychiatrists, clinicians and counselors are trained to treat pathology; the decision to treat is contingent upon whether or not one has a formal diagnosis (Kessler 2002). A formal diagnosis may also be necessary if a patient seeking treatment hopes to receive reimbursement from insurers or HMOs (Rost et al. 1994).

An alternative perspective is that the consequences of loss should be conceptualized more broadly. Studies focusing on dichotomous outcomes only, such as MDD or complicated grief, may underestimate the harmful consequences of loss; distressed individuals who barely fail to meet the criteria for diagnosis are disregarded (Mirowsky and Ross 2002). Moreover, such studies fail to detect potentially positive psychological consequences associated with loss, such as psychological resilience (Bonanno 2004), “benefit-finding” (Nolen-Hoeksema and Davis 2004), personal growth (Carr 2004) and post-traumatic growth (Wortman 2004).

Studying single outcomes is a serious liability to researchers who are interested in documenting the distinctive consequences of loss for specific subgroups. Different gender, age, socioeconomic and ethnic groups may respond to spousal loss in distinctive ways (Aneshensel et al. 1991; Horwitz et al. 1996). To the extent that different groups have distinctive reactions to

loss, then studying a single outcome may mask meaningful group comparisons (Stroebe and Stroebe 1983). For example, studies that compare the psychological adjustment of men and women after marital dissolution show that women manifest depressive symptoms while men tend to evidence alcohol problems (see Umberson and Williams 1999 for a review). Studies that focus on one outcome only would erroneously conclude that one gender systematically fares worse in the face of loss.

Age-related emotional and cognitive changes may also affect the ways that individuals adjust to loss. Older adults are less likely than younger persons to report symptoms of extreme distress or depression, given their reduced levels of emotional reactivity (Carstensen and Turk-Charles 1994). Social class may also condition the ways that bereaved spouses react to loss; research on widows in India has found that high-caste widows fare better than low caste-widows in terms of household economic characteristics, yet they fare no better when diet and body mass index are considered as outcomes, suggesting that general indicators of household economic resources cannot capture the allocation of financial resources to widows in particular (e.g., Jensen 2005). Consequently, studies that focus on single outcomes only may conceal the specific consequences for different subgroups.

Third, studies that use an overarching measure of “well-being” may conceal the ways that specific dimensions of physical and emotional well-being respond to loss. For example, a study of the relationship between widowhood duration and physical health in the United States detected that long-term widowed women (those widowed more than three years) were not significantly different from their married peers on a general indicator of health, yet were much more likely to have specific health conditions, such as hypertension (Wilcox et al. 2003).

The Gendered Nature of the Widowhood Experience

Widowhood is considered an important social problem associated with aging, as the transition is often accompanied by emotional distress, physical symptoms, compromised health behaviors, potentially dis-

ruptive residential relocations and economic strains triggered by both the direct costs of medical care and funeral arrangements at the end of a spouse’s life, as well as the loss of the (working age) spouse’s income. The complications associated with spousal loss differ considerably for men and women, however, and reflect gender differences in employment, health behaviors, social relations and integration, and marital power over the life course. Both the nature and magnitude of these differences vary widely across national and cultural contexts, reflecting cross-national differences in the economic and social opportunities afforded to older women and men. In this section, we review theoretical and empirical work delineating the distinctive consequences of late-life widowhood for men and women. We will focus primarily on the experiences of bereaved spouses in North America and Europe, as the majority of such studies focus on these two regions.

Physical Health Consequences of Widowhood

Of critical interest to demographers is whether spousal loss increases one’s risk of mortality, whether widowers are more susceptible than widows to post-loss mortality and whether the effects of spousal loss on mortality attenuate with the passage of time. The vast majority of studies have documented that currently married persons have lower mortality rates than those who are divorced, separated, widowed, or never married (e.g., Goldman et al. 1995; Hu and Goldman 1990; Sorlie et al. 1995; Waldron et al. 1996). These relationships persist even when potential confounding factors such as age and socioeconomic resources are controlled (Bowling 1987; Schaefer et al. 1995). However, studies based on cross-sectional data fail to reveal whether the relationship between widowhood and mortality reflects stressful short-term aspects of the widowhood transition, beneficial aspects of the marital relationship, or whether those who become and remain widowed have a greater risk of mortality than their healthier peers who either remain married or remarry following spousal loss.

Analyses of the relationship between widowhood status and mortality (and physical health, more generally) typically evaluate several competing hypoth-

eses. *The marriage as protection* perspective holds that marriage brings economic, social and psychological resources that bolster one's health. Moreover, marriage makes individuals more responsible and thus they may turn away from high-risk behaviors. This perspective dates back to the work of Durkheim (1897) and presumes that social integration is protective against health threats and morality. Recent research suggests further that social ties may have a direct positive impact on immune and neuroendocrine function (Kiecolt-Glaser and Glaser 1991; Uchino et al. 1996). Spouses also act as an agent of social control, as they discourage risky behaviors in one another (Umberson 1987). Because men are more likely than women to engage in risk-taking behavior, the social control function of marriage is believed to be more protective for men than for women. For women, the economic resources provided by a spouse are particularly important for bolstering one's health, health behaviors and life expectancy – reflecting women's lower levels of labor force participation and earnings at every stage in the life course, across nearly all nations (Smith and Waitzman 1994; Zick and Smith 1991). However, the marriage as protection perspective cannot differentiate among the distinctive categories of unmarried persons (i.e., never married, divorced, separated and widowed) and presumes that the three categories differ from the married in similar, systematic ways (Thierry 2000).

An alternative perspective, the *selection model*, holds that persons who marry (and remain married) are in better physical and emotional health and thus have a lower risk of mortality than those who do not marry (Kisker and Goldman 1987). Just as healthy persons are more likely than unhealthy persons to marry, healthier persons are also more likely to remain married. Similarly, healthier widowed persons are believed to be more desirable romantic partners and thus remarry more quickly after their loss, leaving in the "currently widowed" category disproportionately those with relatively poor health (Helsing et al. 1981; Waldron, et al. 1996). Given the socioeconomic gradient in mortality where the poor have an elevated risk of mortality, the spouses of those who die (especially those who die prematurely) are more likely to have limited economic resources (Smith and Zick 1996). Thus, they may have an elevated risk of mortality even if their spouse had survived. Given that married couples share a social and physical environment, the spouses of recent dece-

dents who died prematurely may also die prematurely as they shared a potentially unhealthy environment (Stroebe and Stroebe 1983).

Both the marital protection and selection perspectives have been used to explain marital status differences in mortality risk but neither explicitly characterizes the effects of *recent* spousal bereavement on older men's and women's mortality risk. The *family transitions* model suggests that the strain of the transition from married to widowed may compromise one's physical health and subsequent mortality risk. This model is derived from early animal and biological studies of stress, which propose that major changes in one's living conditions or social contexts pose a health threat. Early research by Hans Selye (1936) revealed that a diverse range of physical stressors could trigger a similar set of physiological responses, including alarm and exhaustion. Social models of stress have built upon Selye's work and propose that major life events are associated with a disturbance in one's normal routines (such as maintaining healthy eating and sleeping patterns) and a concomitant increase in stress (Holmes and Rahe 1967). Consistent with this perspective, several studies have shown that recently bereaved persons with high levels of depressive symptoms were at subsequent risk for health events such as heart attack (e.g., Chen et al. 1999).

This perspective has given rise to the observation that older bereaved spouses may die of a "broken heart" shortly after the death of their spouse (Parkes et al. 1969; Stroebe et al. 1981). However, while some empirical studies show that the loss of a spouse may trigger one's own death, the pathway is not necessarily "shock" or "broken heart." Rather, changes in social relationships and daily practices are altered when one's spouse dies. The death of one's spouse may trigger changes in one's health behaviors such as the onset of alcohol use, lack of exercise, compromised sleep and diet, and poor adherence to medication regimens – especially among men whose wives formerly monitored their health behaviors (Mellstrom et al. 1982; Umberson 1992; Williams 2004). Consistent with these ideas, one study based on Finnish mortality records found that recently widowed men (but not women) were more likely than their married peers to die from accidents, alcohol-related conditions, lung cancer and chronic ischemic heart disease but not from causes that were less closely linked to health behaviors (Martikainen and Valkonen 1996a).

One way to assess whether the linkage between spousal mortality and one's own health and mortality reflects the loss of marital resources, or whether it is an immediate response to the stress related to loss is to evaluate the time course of the relationship. The majority of studies find that the effects of widowhood on mortality are most acute during the first few weeks (Kaprio et al. 1987; Martikainen and Valkonen 1996b) or months (Bowling 1987; Manor and Eisenbach 2003; Manzoli et al. 2007; Mineau et al. 2002; Schaefer et al. 1995) after bereavement, whereas far fewer find both short-term and long-term excess mortality among widowed persons (Mellstrom et al. 1982). Most studies attribute the short-term consequences to social selection, shared environment and the fact that the stressors associated with bereavement attenuate with the passage of time.

Researchers have also evaluated whether the consequences of spousal loss are more harmful to the physical health and mortality risk of women versus men. The vast majority of studies show that the effects are stronger for men than women (Bowling 1987; Martikainen and Valkonen 1996b; Mineau, Smith, and Bean 2002; Stroebe and Stroebe 1983), yet Manor and Eisenbach (2003) found no significant gender differences (see also Lund et al. 1986; Jones et al. 1984). Manor and Eisenbach (2003) observed that their nonsignificant gender differences could reflect cultural context, or that different pathways operate for men and women. As noted earlier, the main source of vulnerability for women is financial strain (Smith and Zick 1996), whereas for men the major concern is the reduction in social interaction and social support, as well as the need for health protection and housework. A further line of inquiry is whether the link between widowhood and one's own mortality risk is consistent across social strata and cultural contexts. Most studies have found that the risk of mortality is significantly higher for bereaved persons in higher social strata; this finding has been detected in the United Kingdom (Parkes et al. 1969), Belgium (Lusyne et al. 2001) and Israel (Manor and Eisenbach 2003). However, Schaefer et al. (1995) and Martikainen and Valkonen (1998) found no social class differences in the relative risk of mortality after widowhood.

Several explanations have been posited for the greater mortality risk among bereaved persons with the richest educational and economic resources.

Wortman et al. (1993) have argued that persons with the greatest intellectual and financial resources may highly value having a sense of control over their lives and thus may be most overwhelmed in the face of an uncontrollable event such a spousal loss. Lusyne et al. (2001) proposed that social class shapes both gender roles and the nature of one's social relationships. Persons with lower levels of educational attainment may maintain more extensive interpersonal relationships that transcend the nuclear family; as such, the social support environment of less educated older adults can be better adapted to providing emotional support following bereavement. More highly educated persons, by contrast, may have more heterogeneous social networks that include acquaintances and professional colleagues. However, these more tenuous social ties may not provide emotional or practical support following one's loss. A further explanation is that the consequences of spousal loss are contingent upon how anticipated the loss is. Persons from higher social classes have a lower mortality risk than persons with fewer economic resources, thus they may be more shocked by the loss and may lack peers who can provide empathy and practical support (Suitor et al. 1995).

Studies assessing cross-national and cross-cultural differences in the relation between widowhood and mortality risk are rare because such studies would require comparable data sets from compositionally-similar samples across diverse cultural settings. However, a number of recent studies provide suggestive evidence that the relationship between bereavement and mortality is more pronounced in Western cultures that emphasize individualism and where the nuclear family is socially, economically and residentially autonomous. A recent meta-analysis is the most comprehensive assessment to date of the relationship between widowhood and mortality risk among older adults across diverse national contexts (Manzoli et al. 2007). The analysis focused on 53 studies conducted in 15 nations since 1994. Of the 53 studies considered, 18 were based on elderly populations in the United States, seven in Finland, six in Israel, four in Canada, three each in Denmark and Japan, two each in France, Sweden and the United Kingdom and one each in Australia, Bangladesh, Italy, the Netherlands, Spain and Taiwan. The age of participants across studies ranged from 55 to 93 and more women than men were represented (58 versus 42 per cent). Consistent with

past studies, the authors found that widowed persons had a mortality risk 9–15 per cent higher than their married counterparts. However, these patterns varied across geographic contexts, where effects were significant in samples from Europe and North America but not in Israel and Asia.

The authors did not speculate about the reason for this difference, given the small sample of non-European and North American subjects, yet they did recognize that their findings were consistent with other studies in less industrialized settings. A further examination of physical health differentials in four Asian nations (Philippines, Thailand, Taiwan and Singapore) found a non-significant relationship between widowhood status and a diverse range of physical health outcomes, including self-rated health, symptom counts, vision and hearing impairment and functional limitations (Hermalin et al. 2002). Asian nations are characterized by collective family systems that offer more extra-marital support to older adults. Coresidence with extended family lessens the need to restructure daily practices such as meal preparation and medication regimens, and also ensures that recently bereaved adults have access to sources of social, emotional, instrumental and health-enhancing support.

Psychological Consequences of Widowhood

Widowhood is much more likely to befall women than men, yet both sexes face distinctive psychological challenges as they cope with their partner's death. Studies in Europe and North America reveal that an estimated 40–70 per cent of widowed persons experience a period of two weeks or more marked by feelings of sadness immediately after the loss (e.g., Zisook and Shuchter 1991). Gender differences in emotional distress following late-life widowhood have been researched extensively, yet results remain inconclusive. Several studies report that widows are more likely to become depressed than widowers (e.g., Thompson, Gallagher, Cover, Galewski, and Peterson 1989), whereas most others find widowhood to have a more adverse effect on men than women (Lee, DeMaris, Bavin, and Sullivan 2001; Umberson, Wort-

man, and Kessler 1992). A third group finds no gender differences in the psychological consequences of widowhood (e.g., Zisook and Shuchter 1991).

The conflicting findings in past studies reflect both methodological and substantive issues. As noted earlier, men are more likely than women to die or remarry following spousal loss, thus biasing the results of studies contrasting married and widowed persons at one point in time. Gender differences in psychological health *in general* also need to be taken into consideration before one can conclude that widows or widowers fare worse. Finally, gender differences in psychological reactions to the loss of one's partner may be understated (or overstated) in studies that do not control the mediator (or suppressor) variables that may account for the observed gender gap. The key pathways that link bereavement to psychological adjustment reflect gendered and cultural patterns of social interaction over the life course.

The ways that older women and men experience and adjust to the loss of their partners is inextricably linked to the social roles they have held both within and outside of marriage. Feminist writings, exemplified by Bernard (1972), have argued that traditional marriages – where men specialize in the “breadwinner” role and women are responsible for childbearing and child rearing – benefit women much less than men. Although marriage brings men health, power and life satisfaction, the institution subjects women to stress, dissatisfaction and the loss of self. According to this perspective, women are purported to suffer less upon the loss of their spouse because they have less to lose (Thompson and Walker 1989). Recent empirical studies counter, however, that marriage benefits *both* men and women, yet in different ways (Simon 2002). Women typically benefit economically, whereas men receive richer social and psychological rewards. These gendered patterns of advantage and disadvantage within marriage provide a framework for understanding older adults' adjustment to the spousal loss.

One of the most widely documented sources of women's distress upon widowhood is economic strain. Women are more likely than men to experience economic hardship, upon either divorce or widowhood (Zick and Smith 1991). Although age-based income assistance programs such as Social Security in the United States provide economic support for older widowed persons (Hungerford 2001), the bereaved remain significantly worse off than their married peers. Wid-

owed persons are more likely to live below the poverty line than their married counterparts and they tend to cyclically reenter poverty after losing their partner (Rank and Hirshl 1999). Direct costs associated with the funeral, long-term care, medical care, or estate-related legal proceedings can devastate the fixed income of older adults.

Widows' economic disadvantage reflects life-long patterns of gendered inequality. In developing nations, women have less access to land, capital, credit, technology and other assets, relative to men. Lack of rights to property ownership and inheritance in some societies compromise older women's ability to maintain a basic standard of living in old age (United Nations 2006b). In developed nations, traditional marriage indirectly compromises women's economic well-being – particularly among current cohorts of older adults where wives tended to child rearing and family responsibilities while husbands were responsible for supporting the family financially. As a result, older women have had disrupted work lives (if they worked for pay at all) and fewer years of paid work experience than their male peers. Women's accumulated pension benefits based on their own earnings are typically much lower than those based on their husband's lifetime earnings. The pension benefits and Social Security income of their husband may not be available or may be reduced after his death. Such patterns are not limited to developed nations; in China, for example, older men are twice as likely as older women to have a pension (Leung 1997). Additionally, older widows who try to reenter the labor force may lack the experience to secure a good job or may face age discrimination (Meyer 1996).

These financial stressors, in turn, are an important source of psychological strain. Stressful life events, such as widowhood, may cast off a chain of secondary stressors that have either direct or combined effects on the survivor's well-being. Financial strain is a risk factor for depression (Vinokur et al. 1996). Bereaved women who lack expertise or experience in paying bills, managing money and making major financial or legal decisions may face considerable stress and anxiety when forced to assume sole responsibility for the financial management of the household (Umberson et al. 1992).

Widowers also face distinct disadvantages. In traditional marriages, women typically provide emotional, social, instrumental and health-promoting support to their spouses and children. As a result, widowers who

reside on their own often have difficulty in managing household tasks, maintaining their own health and seeking alternative sources of emotional support after their wives have died. In contrast, women's richer sources of social support over the life course are an important resource as they adjust to the loss of their husbands. Women typically receive more instrumental and emotional support from their children following widowhood than men, given mothers' closer relationships with their children at earlier stages in the life course (Connidis 2001). Women are also more likely to have larger and more varied friendship networks than men and these friendships provide an important source of support to women as they cope with their loss (Antonucci 1990). These patterns reflect life-long processes of gender-role socialization (particularly in current cohorts of older adults), where women are raised to develop close and intimate interpersonal relationships and men are socialized to be self-reliant and independent, with few emotional confidantes other than their spouse.

As noted earlier, the vast majority of research on the psychological consequences of late-life spousal loss focuses on North American and European populations. However, cultural factors may affect the context of and personal adjustments to spousal loss (Krause and Liang 1993). A handful of studies conducted in Asia find elevated levels of psychological distress among recently bereaved older adults, yet they do not detect gender differences. Li and colleagues (Li et al. 2005) found that older widows and widowers had significantly higher levels of depressive symptoms three years after loss. They did not find significant differences between men and women, yet found that persons with high levels of social support from their children fared particularly well. Parent-child coresidence and norms of filial piety were protective to both older men and women as they adjusted to the loss of their spouse.

Research on bereaved men and women in the Philippines, Thailand, Taiwan and Singapore found that spousal loss had a more profound effect on the emotional adjustment of women than men, with the exception of the Singaporean case. Widowed women reported significantly elevated levels of depression in Taiwan and the Philippines and higher levels of loneliness in Thailand. In Singapore, however, the measure of psychological adjustment used was "has no one to turn to." These findings suggest that women

may experience short-term symptoms of depression in patriarchal cultures, although they still appear to have strong social support. The authors attribute these patterns to powerful notions of filial piety, where children provide an enduring source of support to older adults in Asian nations (Hermalin et al. 2002).

Anthropological research in developing nations further underscores how the status of women shapes bereavement experiences. Following the death of their husbands, the social role of older women in Bangladesh changes from the head of the household's domestic operations, to that of a quiet and passive "old widow" and an accompanying loss of authority and status (Ellickson 1988). Studies in Zimbabwe find that older widows live in "destitution, insecurity and low self-esteem" because their possessions are typically confiscated by the relatives of their late husbands (Folta and Deck 1987: 339). In India, newly widowed women are often expected to go into seclusion, followed by a period of confinement either to their home or village (Chen 2000). Widows may be unwelcome at social events and may be avoided because they are considered "bad luck," given their association with death. These gendered cultural practices, in turn, may exacerbate the emotionally devastating effects of spousal loss.

Future Trends and Research Directions

The research presented thus far provides a detailed portrait of late life widowhood in developed and developing nations in the late 20th and early 21st centuries. However, this research describes late life spousal loss as it is currently experienced and not how it may be for future cohorts of older men and women. Current cohorts of older adults were born in the early 20th century: as such, the experiences of widows and widowers in more developed nations reflect the distinctive experiences of a generation who experienced childhood in the Depression (in the United States) or the post-World War I era (in Europe), adolescence in the World War II years and who went on to hold rigid gender-typed social roles as they formed families in the post-War years. Moreover, the experiences documented among large samples of older adults in North America and Europe overwhelmingly reflect the lives of white heterosexuals who had been married only once in their life.

Future generations of older adults will be much more racially, ethnically and religiously diverse and will have family and marital histories that are very different from those of past generations. Current generations of young adult women have higher levels of education, more years of work experience and more egalitarian divisions of labor in their families than past cohorts. Thus, they may be less dependent on their husbands for income, home repair and financial management tasks (Spain and Bianchi 1996). In developing nations, the erosion of the gender gap in literacy may also be accompanied by the elevated status of women and ultimately, the expansion of rights regarding property ownership and inheritance (United Nations 2006b). Under these scenarios, financial, emotional and physical distress may be minimized among future cohorts of widows.

At the same time, adaptation to spousal loss may become more difficult for future cohorts of widow(er)s. Two important demographic trends – increasing divorce rates and declining fertility rates – may have important consequences for how the bereaved adjust to loss. Current cohorts of young married couples are more likely than past generations to dissolve dissatisfying marriages. Consequently, those who remain married until late life may have higher levels of marital closeness and may suffer elevated grief following the loss of these close relationships. Declining fertility rates mean that older adults will have fewer children upon whom they can rely for social support and will be less likely than past generations to have a child who lives close to them (Connidis 2001). Declines in fertility are occurring most rapidly in developing nations; these declines in fertility will be exacerbated by migration patterns, where young adults seek work opportunities far from their aging parents' homes (Kinsella and Velkoff 2001). Future cohorts of older bereaved spouses may need to develop more expansive social networks that include friends and family members who are more proximate, to counterbalance the fact that their children are fewer and less proximate than in past generations.

Future cohorts of older adults may also include increasing numbers of openly gay and lesbian persons. Lack of institutionalized support compounds the difficulty faced by gay partners. Although there are serious shortcomings in Social Security benefit levels and eligibility criteria for surviving spouses who are married in the United States (Richardson 2006), no benefits are available for surviving partners in gay and lesbian relationships. Other rights extended to

heterosexual married couples are not typically available for same-sex couples, including the opportunity to make health care and end-of-life decisions for ill partners. (The legal rights afforded to gay partners are rapidly evolving, however, with a handful of U.S. states now granting gays the right to marry or to form civil unions). Bereaved partners may not receive sufficient emotional support upon loss, because the end of homosexual relationships may not be recognized or acknowledged in the wider community. Some may receive insufficient emotional support from their families of origin, if these relatives disapprove of their lifestyle or sexual orientation (Friend 1990).

Future cohorts of older adults will also be much larger than current cohorts. The number of persons aged 60 and over in the world is estimated at 688 million in 2006 and is projected to increase to almost 2 billion by 2050. Further, older adults will account for an increasingly large share of the overall population. Currently, one out of nine persons is age 60 and older. The United Nations projects that by 2050 one out of every five persons and by 2150 one out of every three persons will be age 60 or older. The proportion is much higher in developed nations today but the pace of aging is much more rapid in developing countries (United Nations 2006a). The most rapidly growing segment of the older population is the "oldest old," or persons ages 80 and older. Persons 80 and older now make up 13 per cent of the world's 60-plus population; this share will increase to 20 per cent by 2050. The number of centenarians is expected to increase 13-fold, from approximately 287,000 to 3.7 million by 2050.

This burgeoning population of older persons and in particular older widows and widowers, will demand the attention of policy makers, given the oldest-old's elevated risk of physical disability and cognitive impairment. Future generations of spousal caregivers will also include many frail persons who may be overwhelmed by caregiving and the eventual death of their spouse. Bereavement researchers will need to identify the distinctive challenges facing both the "young" old (i.e., persons age 65–84) and the oldest old.

As life expectancy continues to increase, the nature, cause and trajectories of death will change; the context of death has important implications for older adults and their soon-to-be bereaved spouses. Most older adults today die of long-term chronic illness; heart disease, stroke and cancer are now the leading causes of death and account for roughly two-thirds of all

deaths to older adults in all developed and most developing nations (Kinsella and Velkoff 2001). Although advanced medical technologies and treatments now enable chronically ill older adults to live longer, the quality of life during the final days is poor (Field and Cassel 1997). Most dying elderly have limited mobility, cognitive impairment, pain and difficulty recognizing family. In many cases, the dying have little control over the medical treatment they receive and difficult decisions about stopping, starting or continuing treatment fall upon distressed spouses (Addington-Hall et al. 1998; Brock and Foley 1998).

However, recent policies and practices, including the establishment of the Patient Self-Determination Act (1990) in the United States and expanded use of palliative care worldwide may give future cohorts of older persons greater control over the conditions surrounding their loved ones' deaths (Burn 1997; Pan et al. 2001; Stjernward 1997). These changes may help to reduce the strains associated with widowhood and other family deaths. Deaths that are painful to the patient and where physicians provide unsatisfactory care are associated with poorer spousal adjustment (Carr 2003). However, medical advancements that extend the length of life may create the need for more intensive caregiving, a task that typically falls to women. If the duration and intensity of late-life caregiving increases and if women continue to bear the burden for personal care, then cohorts of women entering old age in the future may face a more difficult adjustment to spousal loss.

The well-being of older widows and widowers and the demographic, economic, social and cultural determinants of their well-being will likely attract increased attention from demographers as populations age rapidly throughout the world. Further exploration of the way that social and cultural forces shape the bereavement experience of older adults and further attention to the methodological and data concerns underlying such investigations will provide knowledge of practical and political importance for the world's older adults.

References

- Addington-Hall J, Altmann D, McCarthy M (1998) Variations by age in symptoms and dependency levels experienced by people in the last year of life, as reported by surviving family, friends, and officials. *Age Ageing* 27:29–36

- Alwin DF, Campbell RT (2001) Quantitative approaches: Longitudinal methods in the study of human developing and aging. In: Binstock RH, George LK (eds), *Handbook of aging and the social sciences*, 5th ed. Academic Press, New York, pp 22–43
- Aneshensel CS, Rutter CM, Lachenbruch PA (1991) Competing conceptual and analytic models: Social structure, stress, and mental health. *Am Sociol Rev* 56:166–178
- Antonucci TC (1990) Social support and social relationships. In: Binstock RH, George LK (eds) *Handbook of aging and the social sciences*, 3rd ed. Academic Press, San Diego, CA, pp 205–226
- Apt NA (2001) Rapid urbanization and living arrangements of older persons in Africa. *Population bulletin of the United Nations – aging and living arrangements of older persons: critical issues and policy responses*, ST/ESA/SER.N/42–43. United Nations: New York
- Arbuckle NW, de Vries B (1995) The long-term effects of later life spousal and parental bereavement. *Gerontologist* 35:637–647
- Atoh M (1998) Who takes care of children and the elderly in an aging society? Paper presented for the Recontres Saavy International Seminar, Institut National d'Etude Demographique, Paris, 14–15 October
- Avison WR, Turner RJ (1988) Stressful life events and depressive symptoms: Disaggregating the effects of acute stressors and chronic strains. *J Health Soc Behav* 29:253–264
- Barry LC, Kasl SV, Prigerson HG (2002) Psychiatric disorders among bereaved persons: The role of perceived circumstances and preparedness for death. *Am J Geriatr Psych* 10:447–457
- Berardo FM (1970) Survivorship and social isolation: The case of the aged widower. *Fam Coordinat* 19:11–25
- Bernard J (1972) *The future of marriage*. Bantam, New York
- Bonanno G (2004) Loss, trauma, and human resilience: Have we underestimated the human capacity to thrive after extremely aversive events? *Am Psychol* 59:20–28
- Bowling A (1987) Mortality after bereavement: A review of literature on survival periods and factors affecting survival. *Soc Sci Med* 24:117–124
- Brock D, Foley D (1998) Demography and epidemiology of dying in the U.S., with emphasis on deaths of older persons. *Hosp J* 13:49–60
- Bruce ML, Kim K, Leaf PJ, Jacobs S (1990) Depressive episodes and dysphoria resulting from conjugal bereavement in a prospective community sample. *Am J Psychiat* 157:608–611
- Burn J (1997) Palliative care in India. In: Clark D, Hockley J, Ahemdai S (eds) *Buckingham*, Open University, England, pp 116–128
- Carr D (2003) A 'good death' for whom? Quality of spouse's death and psychological distress among older widowed persons. *J Health Soc Behav* 44:217–334
- Carr D (2004) Gender, pre-loss marital dependence and older adults' adjustment to widowhood. *J Marriage Fam* 66:220–235
- Carr D, Nesse RM, Wortman CB (eds) (2006) *Spousal bereavement in late life*. Springer Publishing, New York
- Carstensen L, Turk-Charles S (1994) The salience of emotion across the adult life span. *Psychol Aging* 9:259–64
- Cattell M (1997) African widows, culture, and social change: Case studies from Kenya. In J. Sokolovsky (ed) *Cultural context of aging*, 2nd ed. Bergin & Garvey, Westport, CT, pp 71–98
- Chan A (1997) An overview of the living arrangements and social support exchanges of older Singaporeans. *Asia Pac Popul J* 12:35–50
- Chen MA (2000) *Perpetual mourning: Widowhood in rural India*. New Delhi: Oxford University Press, Oxford
- Chen JH, Bierhals AJ, Prigerson HG, Kasl SV, Mazure CM, Jacobs S (1999) Gender differences in the effects of bereavement-related psychological distress in health outcomes. *Psychol Med* 29:367–380
- Connidis I (2001) *Family ties and aging*. Sage Publications, Thousand Oaks, CA
- Cowgill DO (1979) Aging and modernization: A revision of the theory. In: Hendricks J, Hendricks CD (eds), *Dimensions of aging: readings*, Winthrop Publishers, Cambridge, MA, pp 54–68
- Dex S (1995) Reliability of recall data: A literature review. *Bulletin de Methodologie Sociologique* 49:58–89
- Dohrenwend BP, Levav I, Shrout PE (1992) Socioeconomic status and psychiatric disorders: The causation-selection issue. *Science* 255:946–951
- Durkheim E (1981)[1897]. *Suicide*. Free Press, New York
- Ellickson J (1988) Never the twain shall meet: aging men and women in Bangladesh. *J Cross Cult Gerontol* 3:3–70
- Ferraro KF, Barresi CM (1982) The impact of widowhood on the social relations of older persons. *Res Aging* 4:227–247
- Field MJ, Cassel CK (1997) *Approaching death: Improving care at the end of life*. Institute of Medicine, Washington, DC
- Folta JR, Deck ES (1987) Elderly black widows in rural Zimbabwe. *J Cross Cult Gerontol* 2:321–42
- French HW (2006) As Chinese cities book, old are left behind. *New York Times*, 20 November, 2006
- Friend RA (1990) Older lesbian and gay people: A theory of successful aging. *J Homosex* 23:99–118
- Gierveld JD (2001) Gender and well-being: the elderly in the industrialized world. Paper prepared for the International Union for the Scientific Study of Population Seminar on Populating Ageing in the Industrialized Countries: Challenges and Responses, Tokyo, March 19–21
- Glaser K, Agree EM, Costenbader E, Camargo A, Trench B, Natividad J, Chuang YL (2006) Fertility decline, family structure, and support for older persons in Latin America and Asia. *J Aging Health* 18:259–291
- Goldman N, Korenman S, Weinstein R (1995) Marital status and health among the elderly. *Soc Sci Med* 40:1717–1730
- Ha J, Carr D, Utz R, Nesse R (2006) Older adults' perceptions of intergenerational support after widowhood: How do men and women differ? *J Fam Issues* 27:3–30
- Heckman JJ (1979) Sample selection bias as a specification error. *Econometrica* 47:153–161
- Heckman J, Singer B (1984) A method for minimizing the impact of distributional assumptions in econometric models for duration data. *Econometrica* 52:271–320
- Helsing KM, Szklo M, Comstock GW (1981) Factors associated with mortality after widowhood. *Am J Public Health* 71:802–809
- Hermalin AI, Ofstedal MB, Mehta K (2002) The vulnerable and their potential disadvantages. In: Hermalin AI (ed) *The well-being of the elderly in Asia: A four-country comparative study*, University of Michigan Press, Ann Arbor, MI, pp 461–518

- Holmes T, Rahe R (1967) The social readjustment scale. *J Psychosom Res* 11:213–218
- Horwitz AV (2002) Outcomes in the sociology of mental health and illness: Where have we been and where are we going. *J Health Soc Behav* 43:143–151
- Horwitz AV, White HR, Howell-White S (1996) The use of multiple outcomes in stress research: A case study of gender differences in responses to marital dissolution. *J Health Soc Behav* 37:278–91
- Hu YR, Goldman N (1990) Mortality differentials by marital status: An international comparison. *Demography* 27:233–250
- Hungerford TL (2001) The economic consequences of widowhood on elderly women in the United States and Germany. *Gerontologist* 41:103–110
- Hyman HH (1983) *Of time and widowhood: Nationwide studies of enduring effects*. Duke University Press, Durham, NC
- Jacobs S, Kasl S, Ostfeld A (1986) The measurement of grief: Bereaved versus non-bereaved. *Hosp J* 2:21–36
- Jacobzone S (1999) Ageing and care for elderly persons: an overview of international perspectives. *Labor Market and Social Policy Occasional Papers*, No. 38, Organization for Economic Cooperation and Development, Paris
- Jensen R (2005) Caste, culture, and the status and well-being of widows in India. In: Wise DA (ed) *Analyses in the economics of aging Chicago*: University of Chicago Press. Chicago, pp 357–375
- Jones DA, Goldblatt PO, Leon D (1984) Bereavement and cancer: Some data on deaths of spouses from the longitudinal study of office of population censuses and surveys. *Br Med J* 289:461–464
- Kamo Y (1988) A note on elderly living arrangements in Japan and the United States. *Res Aging* 10:297–305
- Kaprio J, Koskenvuo M, Rita H (1987) Mortality after bereavement: A prospective study of 95,647 widowed persons. *Am J Public Health* 77:283–287
- Karlsson SG, Borell K (2002) Intimacy and autonomy, gender and ageing: Living apart together. *Ageing Int* 27:11–26
- Kessler RC (2002) The categorical versus dimensional assessment controversy in the sociology of mental illness. *J Health Soc Behav* 43:171–188
- Kiecolt-Glaser JK, Glaser R (1991) Stress and immune function in humans. In: Ader R, Felten DL, Cohen N (eds) *Psychoneuroimmunology*, 2nd ed. Academic Press, New York, pp 849–867
- Kinsella K (1996) Aging and the family: Present and future demographic issues. In: Blieszner R, Bedford VH (eds) *Aging and the family: Theory and research* Westport, CT: Greenwood, pp 32–56
- Kinsella K, Velkoff V (2001) US Census Bureau, Series P95/01-1. *An aging world: 2001*. US Government Printing Office, Washington DC
- Kisker EE, Goldman N (1987) Perils of single life and benefits of marriage. *Soc Biol* 34:135–152
- Knodel J, Chayovan N (1997) Family support and living arrangements of Thai elderly. *Asia Pac Popul J* 12:51–68
- Kobasa SC (1979) Stressful life events, personality and health: an inquiry into hardiness. *J Pers Soc Psychol* 37:1–11
- Kobasa SC (1993) Hardiness and health: A prospective study. *J Pers Soc Psychol* 65:207
- Krause N, Liang J (1993) Stress, social support, and psychological distress among the Chinese elderly. *J Gerontol* 48:282–91
- Lee GR, DeMaris A, Bavin S, Sullivan R (2001) Gender differences in the depressive effect of widowhood in later life. *J Gerontol: Soc Sci* 56:S56–S61
- Leung J (1997) Family support for the elderly in China: Issues and challenges. *J Aging Soc Pol* 9:87–101
- Li L, Liang J, Toler A, Gu S (2005) Widowhood and depressive symptoms among older Chinese: Do gender and sources of support make a difference? *Soc Sci Med* 60:637–647
- Little RJ, Rubin DB (1987) *Statistical analysis with missing data*. Wiley, New York
- Little RJ, Schenker N (1995) Missing data. In: Arminger G, Clogg CC, Sobel ME (eds), *Handbook of statistical modeling for the social and behavioral sciences*, Plenum, New York, pp 39–75
- Liu X, Hermalin AI, Chuang YL (1998) The effect of education on mortality among older Taiwanese and its pathways. *J Gerontol Soc Sci* 53B:S71–S82
- Lopata HZ (1973) *Widowhood in an American city*. Schenkman, Cambridge, MA
- Lund DA, Caserta MS, Dimond MF (1986) Gender differences through two years of bereavement among the elderly. *Gerontologist* 26:314–320
- Lusyne P, Page H, Lievens J (2001) Mortality following conjugal bereavement, Belgium 1991–96: The unexpected effect of education. *Popul Stud* 55:281–189
- Manor O, Eisenbach Z (2003) Mortality after spousal loss: are there socio-demographic differences? *Soc Sci Med* 56:405–413
- Manzoli L, Villari P, Pirone GM, Boccia A (2007) Marital status and mortality in the elderly: A systematic review and meta-analysis. *Soc Sci Med* 64:77–94
- Martikainen P, Valkonen T (1996a) Mortality after the death of a spouse: Rates and causes of death in a large Finnish cohort. *Am J Public Health* 86:1087–1093
- Martikainen P, Valkonen T (1996b) Mortality after death of a spouse in relation to duration of bereavement in Finland. *J Epidemiol Commun Health* 50:264–268
- Martikainen P, Valkonen T (1998) Do education and income buffer the effects of death of spouse on mortality? *Epidemiol* 9:530–534
- Mason KO (1993) The impact of women's position on demographic change during the course of development. In: Federici N, Mason KO, Sogner S (eds), *Women's position and demographic change*, Clarendon Press, Oxford, pp 19–42
- Mastekaasa A (1992) Marriage and psychological well-being: Some evidence on selection into marriage. *J Marriage Fam* 54:901–911
- McDonough P, Williams DR, House JS, Duncan GJ (1999) Gender and the socioeconomic gradient in mortality. *J Health Soc Behav* 40:17–31
- Mellstrom D, Nilsson A, Oden A, Rundgren A, Svanborg A (1982) Mortality among the widowed in Sweden. *Scand J Soc Med* 10:33–41
- Meyer MH (1996) Making claims as workers or wives: The distribution of social security benefits. *Am Sociol Rev* 61:449–465
- Mineau GP, Smith KR, Bean LL (2002) Historical trends of survival among widows and widowers. *Soc Sci Med* 54:245–254
- Mirkin, Barry and Weinberger, Mary Beth (2001) *The demography of population aging. Population bulletin of the United Nations. Aging and living arrangements of older persons: Critical issues and policy responses 2001*. (ST/ESA/SER-N/42-43) New York, United Nations

- Mirowsky J, Ross CE (2002) Measurement for a human science. *J Health Soc Behav* 43:152–70
- Moss MS, Moss SZ, Hansson RO (2001) Bereavement and old age. In: Stroebe MS, Hansson RO (eds), *Handbook of bereavement research: Consequences, coping and care*. American Psychological Association, Washington, DC, pp 241–260
- Murray CJL, Bobadilla JL (1997) Epidemiological transitions in the former socialist economies: Divergent patterns of mortality and causes of death. In: Bobadilla JL, Costello CA, Mitchell F (eds), *Premature death in the new independent states*. National Academy Press, Washington, DC, pp 184–219
- Nolen-Hoeksema S, Davis CG (2004) Theoretical and methodological issues in the assessment and interpretation of post-traumatic growth. *Psychol Inq* 15:60–65
- Organization for Economic Cooperation and Development (OECD) (1996) *Caring for frail elderly people*. Social Policy Studies, No 19. Paris
- Pan CX, Morrison RS, Meier DE (2001) How prevalent are hospital-based palliative care programs? Status report and future directions. *J Palliat Med* 4:315–324
- Parkes CM (1965) Bereavement and mental illness: Part I, A clinical study of the grief of bereaved psychiatric patients. *Br J Med Psychol* 38:1
- Parkes CM, Benjamin W, Fitzgerald RG (1969) The broken heart: A statistical study of increased mortality among widowers. *Br Med J* 1:740–743
- Patient Self-Determination Act of 1990. 554206, 4751 of the Omnibus Reconciliation Act of 1990. Pub.L. No. 101–508
- Peters A, Liefbroer AC (1997) Beyond marital status: Partner history and well-being in old age. *J Marriage Fam* 56:687–699
- Presser H, Sen G (2000) Women's empowerment and demographic processes: Laying the groundwork. In: Presser H, Sen G (eds) *Women's empowerment and demographic processes: moving beyond Cairo*. Oxford University Press, Oxford, pp 3–14
- Preston S, Taubman P (1994) Socioeconomic differences in adult mortality and health status. In: Martin LG, Preston SH (eds), *Demography of aging*. National Academy Press, Washington, DC, pp 279–318
- Prigerson HG, Frank E, Kasl SV, Reynolds CF, Anderson B, Zubenko GS, et al (1995) Complicated grief and bereavement-related depression as distinct disorders: Preliminary empirical validation in elderly bereaved spouses. *Am J Psychiatry* 152:22–30
- Prigerson HG, Jacobs SC (2001) Traumatic grief as a distinct disorder: A rationale, consensus criteria, and a preliminary empirical test. In: Stroebe MS, Hansson RO (eds), *Handbook of bereavement research: Consequences, coping, and care*. American Psychological Association, Washington, DC, pp 613–645
- Prigerson HG, Shear MK, Jacobs SC, Reynolds CF, Maciejewski PK, Davidson, et al (1999) Consensus criteria for traumatic grief: A preliminary empirical test. *Br J Psychiatry* 174:67–73
- Radloff LS (1977) The CES-D scale: A self-report depression scale for research in the general population. *Appl Psychol Measure* 1:385–401
- Rank MR, Hirschl TA (1999) Estimating proportion of Americans ever experiencing poverty during their elderly years. *J Gerontol* 54B:S184–S193
- Richardson VE (2006) Implications for public policies and social services: What social workers and other gerontology practitioners can learn from the Changing lives of older couples study. In: Carr D, Nesse RM, Wortman CB (eds), *Spousal bereavement in late life*. Springer Publishing, New York, pp 81–116
- Rost K, Smith R, Matthews DB, Guise B (1994) The deliberate misdiagnosis of major depression in primary care. *Arch Fam Med* 3:333–337
- Rowland DT (1991) *Population ageing in Australia*. International Institute on Aging, Malta
- Ryder R, Kamenga M, Nkusu M, Batter V, Heyward W (1994) AIDS orphans in Kinshasa, Zaire: Incidence and socio-economic consequences. *Curr Sci* 8:673–80
- Schaefer C, Quesenberry CP, Wi S (1995) Mortality following conjugal bereavement and the effects of a shared environment. *Am J Epidemiol* 141:1142–1152
- Schwarz, N, Park, D, Knauper B, Sudman S (eds) (1999) *Cognition, aging and self-reports*. Psychology Press, Philadelphia
- Sennott-Miller L (1989) *Midlife and older women in Latin America and the Caribbean*. Pan American Health Organization and American Association of Retired Persons. Washington, D.C
- Selye H (1936) Syndrome produced by diverse nocuous agents. *Nature* 138:32
- Silverman PR (1986) *Widow-to widow*. Springer Publishing. New York
- Simon R (2002) Revisiting the relationship among gender, marital status, and mental health. *Am J Sociol* 107:1065–1096
- Smith KR, Waitzman NJ (1994) Double jeopardy: The interaction effects of marital and poverty status on the risk of mortality. *Demography* 31:487–508
- Smith KR, Zick CD (1996) Risk of mortality following widowhood: Age and sex differences by mode of death. *Soc Biol* 4:59–71
- Sorlie PD, Backlund E, Keller JB (1995) U.S. mortality by economic, demographic, and social characteristics: The National Longitudinal Mortality Study. *Am J Public Health* 85:949–56
- Spain D, Bianchi SM (1996) *Balancing act: Motherhood, marriage and employment among American women*. Russell Sage. New York
- Stehouwer J (1968) The household and family relations of older people. In: Shanas E (ed) *Old people in three industrial societies*. Atherton, New York, pp 177–226
- Stjernsward J (1997) The WHO cancer pain and palliative care programme. In: Clark D, Hockley J, Ahemdai S (eds) *Open University, Buckingham, England*, pp 203–12
- Stroebe MS, Stroebe W, Gergen KJ, Gergen M (1981–1982) The broken heart: Reality or myth? *Omega* 12:87–106
- Stroebe MS, Hansson RO, Stroebe W (1993) Contemporary themes and controversies in bereavement research. In: Stroebe MS, Stroebe W, Hansson RO (eds) *Handbook of bereavement: Theory, research, and intervention*. Cambridge University Press, Cambridge, England, pp 457–476
- Stroebe MS, Stroebe W (1983) Who suffers more? Sex differences in health risks of the widowed. *Psychol Bull* 93:279–301
- Suitor JJ, Pillemer K, Keeton S (1995) When experience counts: the effects of experiential and structural similarity of patterns of support and interpersonal stress. *Soc Forces* 73:1573–88
- Tabolski PA (2004) Global aging: Implications for women and women's health. *JGNN (September/October)* 627–638
- Thierry X (2000) Risks of mortality and excess mortality during the first ten years of widowhood. *Population: En Sel* 12:81–109

- Thompson LW, Gallagher D, Cover H, Galewski M, Peterson J (1989) Effects of bereavement on symptoms on psychopathology in older men and women. In: Lund A (ed) *Older bereaved spouses: Research with practical applications* Hemisphere, New York, pp 17–24
- Thompson L, Walker AJ (1989) Gender in families: women and men in marriage, work, and parenthood. *J Marriage Fam* 51:845–871
- Uchino BN, Cacioppo JT, Kiecolt-Glaser JK (1996) The relationship between social support and physiological processes: A review with emphasis on underlying mechanisms and implications for health. *Psychol Bull* 119:488–531
- Umberson D (1987) Family status and health behaviors: Social control as a dimension of social integration. *J Health Soc Behav* 28:306–319
- Umberson D (1992) Gender, marital status and the social control of health behavior. *Soc Sci Med* 34:907–917
- Umberson D, Wortman CB, Kessler RC (1992) Widowhood and depression: Explaining long-term gender differences in vulnerability. *J Health Soc Behav* 33:10–24
- Umberson D, Williams K (1999) Family status and mental health. In: Aneshensel S, Phelan JC (eds) *Handbook of the sociology of mental health*. Kluwer Academic, New York, pp 225–254
- United Nations. 2005a. *World population ageing 1950–2050*. United Nations, Department of Economic and Social Affairs, Population Division, New York
- United Nations. 2005b. *Living arrangements of older persons around the world*. United Nations, Department of Economic and Social Affairs, Population Division, New York
- United Nations. 2006a. *Population aging 2006*. United Nations, Department of Economic and Social Affairs, Population Division, New York
- United Nations. 2006b. *The world's women 2005: progress in statistics*. United Nations, Department of Economic and Social Affairs, Statistics Division, New York
- UNAIDS (2006) *Joint United Nations Programme on HIV/AIDS and World Health Organization – December 2006 AIDS Epidemic Update*. UNAIDS: Geneva, Switzerland
- Utz R, Carr D, Nesse R, Wortman CB (2002) The effect of widowhood on older adults' social participation: An evaluation of activity, disengagement, and continuity theories. *Gerontologist* 42:522–33
- Velkoff V, Lawson V (1998) *International brief: Gender and aging*. U.S. Department of Commerce, Economics, and Statistics Administration. Washington DC, Bureau of the Census
- Velkoff V, Kinsella K (1993) *Aging in Eastern Europe and the former Soviet Union*. U.S. Census Bureau, Washington, DC, Government Printing Office
- Verbrugge, LM (1985) Gender and health: An update on hypotheses and evidence. *J Health Soc Behav* 26:156–182
- Vinokur AD, Price RH, Caplan RD (1996) Hard times and hurtful partners: How financial strain affects depression and relationship satisfaction of unemployed persons and their spouses. *J Pers Soc Psychol* 7:166–179
- Virganskaya IM, Dmitriev VI (1992) Some problems of medicodemographic development in the former USSR. *World Health Statistics Quarterly*, 45:4–14
- Waldron I, Hughes ME, Brooks TL (1996) Marriage protection and marriage selection: Prospective evidence for reciprocal effects of marital status and health. *Soc Sci Med* 43:113–123
- Wheaton B (1999) Social stress. In: Aneshensel CS Phelan JC (eds) *Handbook of the sociology of mental health*. Kluwer Academic, New York, pp 277–300
- Wheeler I (2001) Parental bereavement: The crisis of meaning. *Death Stud* 25:51–66
- Wilcox S, Everson KR, Aragaki A, Wasserthil-Smooller S, Mouton CP, Loevinger BL (2003) The effects of widowhood on physical and mental health, health behaviors, and health outcomes: The Women's Health Initiative. *Health Psychol* 22:513–22
- Williams K (2004) The transition to widowhood and the social regulation of health: Consequences for health and health risk behavior. *J Gerontol: Soc Sci* 59:S343–S349
- Wolff K, Wortman CB (2006) Psychological consequences of spousal loss among older adults: Understanding the diversity of responses. In: Carr D, Nesse RM, Wortman CB (eds) *Spousal bereavement in late life*. Springer Publishing, New York, pp 81–116
- Wortman CB (2004) Post-traumatic growth: Progress and problems. *Psychol Inq* 15:81–91
- Wortman CB, Cohen-Silver R, Kessler RC (1993) The meaning of loss and adjustment to bereavement. In: Stroebe MS, Stroebe W, Hansson RO (eds) *Handbook of bereavement*. Cambridge University Press, Cambridge, pp 349–366
- Zhou, Y. (2000) *Will China's current population policy change its kinship system?* Nihon University Population Research Institute Research Paper Series, No. 70. Tokyo
- Zick CD, Smith KR (1991) Marital transitions, poverty, and gender differences in mortality. *J Marriage Fam* 53:27–36
- Zisook S, Paulus M, Shuchter SR, Judd LL (1997) The many faces of depression following spousal bereavement. *J Affect Disord* 45:85–94
- Zisook S, Shuchter SR (1991) Early psychological reaction to the stress of widowhood. *Psychiatry* 54:320–332

Part VIII
Future of Aging

Chapter 33

The Future of Human Longevity

S. Jay Olshansky and Bruce A. Carnes

Introduction

The modern rise in life expectancy is one of humanity's crowning achievements. After more than 200,000 years of slow but steady increases in life expectancy for anatomically modern people like us (McNeill 1976), a new chapter in the book of human longevity began in the middle of the 19th century when a quantum leap in duration of life began (Omran 1971). The external forces of mortality (e.g., infectious diseases, predation and accidents) that precluded survival beyond the first few years of life for most people were significantly relaxed as modern humans learned how to insulate themselves from the major hazards of the outside world. As a result, the biological consequences of aging are now a common occurrence for the first time in the history of our species. This longevity benefit, however, was accompanied by a trade-off involving a rise in such fatal diseases as cancer, heart disease, stroke and Alzheimer's disease, as well as such chronic conditions as sensory impairments, arthritis and dementia.

In today's world we see countries with life expectancies as high as 85 years for women and approaching 80 years for men. It would appear to some that this historic rise in longevity has no end in sight (Oeppen and Vaupel 2002; Wilmoth 1998). Others suggest that while there are no genetic mechanisms that evolved to limit the duration of life, there are nevertheless limits

on duration of life imposed by a spectrum of forces (e.g., biochemical, biomechanical, biodemographic and stochastic) that exist at virtually every level of biological organization. Although large increases in life expectancy are still possible, attaining those increases will require a source of mortality decline different from those observed in the past (Olshansky et al. 2001, 2005).

How much further can the envelope of human survival be extended? Is it possible that life expectancy in developed countries can continue to rise in the future as it did during most of the 20th century? Can the maximum documented lifespan of 122 years for humans (experienced by Madame Jeanne Calment from France; Allard et al. 1998) be broken and if this record was broken would it have any scientific relevance? Is there any reason why humans cannot live to 200 years or more? Is physical immortality possible as some suggest (de Grey et al. 2002; Kurzweil and Grossman 2004)?

Pathways to Longer Life

There are three basic views of the future of human longevity. One view has been developed by those we shall label *futurists*. The futurists contend that yet-to-be-developed advances in biomedical technology and the anticipated emergence of nanotechnology are going to radically transform the landscape of human aging and longevity – leading us down a pathway toward physical immortality and eternal youth. A second view has been developed by a group we shall label *optimists*. The optimists believe that the historic rise in life expectancy will continue at its previous pace of about 2.5 years added

S. J. Olshansky (✉)
School of Public Health
University of Illinois at Chicago
Division of Epidemiology and Biostatistics
1603 West Taylor Street, Room 885
Chicago, Illinois 60612, USA
E-mail: sjayo@uic.edu

per decade – leading to a life expectancy at birth of 100 years for some countries later in this century. The third view comes from a group we shall label *realists*. The realists contend that there are identifiable and measurable biological, biodemographic, biomechanical, evolutionary and stochastic reasons why life expectancy at birth is unlikely to rise much beyond about 88 years for women and 82 years for men – a “barrier” that the realists contend can be breached if technology capable of slowing the rate of biological aging can eventually be discovered and broadly disseminated.

The Futurists

The futurists claim that life expectancy is on the verge of being dramatically extended, that physical immortality is on the horizon and that some people alive today will drink from a fountain of youth that science has yet to discover (de Grey 2002; Kurzweil and Grossman 2004). De Grey identifies seven cellular and molecular differences between the young and old that if fixed will eliminate aging and make physical immortality possible (de Grey et al. 2002). He predicted (with 95 per cent confidence) that a massive funding effort could produce the breakthroughs needed to achieve immortality somewhere between 2015 and 2040 (de Grey 2005). According to the futurists, immortality will occur when life-extending treatments reduce age-specific death rates faster than aging can raise them – a point that de Grey calls the “Longevity Escape Velocity” (LEV).

Kurzweil and Grossman (2004) based their claim for immortality on the anticipated and required development of three technological bridges to the future of life extension. “Bridge One” technologies are composed of nutritional supplements, changes in lifestyle and extensive health care screening that when combined will, according to the authors, allow people to live an additional 20 years beyond the life expectancies that prevail today. After 20 years, “Bridge Two” biomedical technologies (e.g. stem cell therapy, genetic engineering and “rejuvenation technologies”) are then expected to come on line. Around the middle of the 21st century, the expectation is that the Bridge Two survivors will begin benefiting from the Bridge Three technologies (e.g., nanotechnology) that Kurzweil and Grossman claim will lead to immortality. A fundamental tenet of the futurist reasoning is the premise that technological

development will continuously increase at a progressively faster rate (Kurzweil 2005). In both the de Grey and Kurzweil scenarios, physical immortality accompanied by eternal youth will be achieved for all of humanity sometime by the middle of the 21st century. In their future world, the extreme elderly by today’s standards (i.e., those aged 85 +) would be indistinguishable (physically and mentally) from people at young and middle ages today. In effect, old age would cease to exist and the world would become populated only by those who are physically healthy and mentally vibrant.

The futurist line of reasoning is totally dependent on something that does not currently exist – life-extending technologies that yield eternal life. Furthermore, there is no evidence to support the initial assertion of Kurzweil and Grossman (2004) that people alive today can survive another 20 years because of Bridge One interventions. Although this picture of the future is painted with a chain of speculations and unsupported assumptions (Warner et al. 2005), the interventions promulgated by futurists serve a useful role by stimulating thinking about novel evidence-based interventions. It must be said, however, that visions of a world filled with immortal and forever young people is a recurring scenario that longevity prophets of every era have been predicting for thousands of years (Gruman 1966). Unfortunately for the futurists, immortality and eternal youth remain wishful pursuits lacking scientific credibility and biological plausibility.

The Optimists

In developed nations over the last century and a half there have been relatively consistent declines in the age-specific risk of death and increases in life expectancy at birth. The historical record documenting these demographic changes is the key source used by optimists for their projections of life expectancy in the future. As such, the optimists are assuming that the future will be a continuation of the past (Oeppen and Vaupel 2002). This approach to forecasting has led to the prediction that life expectancy at birth in the United States will rise to 100 years by the year 2060 (Oeppen and Vaupel 2002). Advocates of this approach have declared that there are no biological or demographic reasons why death rates cannot decline to zero (Wilmoth 2001). Biologically imposed upper limits on the life

span of individuals and the life expectancy of populations are also rejected by the optimists. Data used to support these positions include unabated historical increases in the world record for life expectancy at birth (defined by one country annually; Oeppen and Vaupel 2002), largely unabated increases in the maximum age at death (defined by one person annually in one country – Sweden; Wilmoth et al. 2000), as well as steady declines in old-age mortality observed in G7 nations (Tuljapurkar and Boe 2000).

The validity of the method used by optimists to forecast life expectancy depends on a strong demographic assumption; namely, that future trends in mortality are invariant continuations of those observed in the recent past. This approach to forecasting not only ignores documented biological constraints on duration of life (Austad 1999; Carnes et al. 2003; Hayflick 2000; Holliday 2007; Olshansky and Carnes 2001; Kirkwood 2003), it rejects them. In the absence of limits, optimists rely on biomedical technologies that do not currently exist in order to achieve their predictions of large declines in old age mortality in the future. Further, by ignoring cause of death and relying on past trends in total mortality, their extrapolation models cannot capture the mortality changes that are already occurring as infectious disease deaths at young ages are being progressively replaced by degenerative disease deaths at old ages (Carnes 2004; Carnes et al. 2006). Finally, the optimists' approach ignores emerging cohort effects that are already having a negative impact on life expectancy (e.g. childhood obesity – Olshansky et al. 2005; infectious disease – Olshansky et al. 1997) and observed declines in life expectancy already being observed in the modern era (United Nations 2003).

The Realists

Realists contend that there are an abundance of documented biological and non-biological forces known to influence duration of life for humans and other organisms. One of the most prominent of these is aging itself. The current reality is that aging cannot be stopped or reversed and there is disagreement among respected experts in the field of aging on whether or how much it can be slowed (Olshansky et al. 2002). Even if a means of slowing aging is found, it is unlikely that the intervention could be implemented on a large enough

scale in the near term to have a measurable impact on a population statistic like life expectancy. Realists also suggest that aging and duration of life is fundamentally linked to processes (growth, development, maturation, reproduction and nurturing) that are intrinsic to the biology of all living things, including humans (Carnes et al. 1996, 2003). These processes and the biological clocks associated with them have their origins in evolutionary antiquity. Manipulating these intricate and evolutionarily conserved mechanisms in order to extend duration of life will be difficult to achieve without also having unintended negative consequences.

At a population level, biodemographic constraints on duration of life have been discussed extensively in the literature (Carnes et al. 1996; Olshansky et al. 1990; Olshansky et al. 2001). So called entropy in the life table makes the demographic measure of life expectancy less sensitive to declines in death rates as life expectancy rises. For example, it becomes extremely difficult to raise life expectancy further when it approaches 80 years (Olshansky et al. 2001). The likely biological reason for this demographic phenomenon is that adding 80 years to the life of an infant is achievable, whereas, adding 80 years to the life of an 80 year old is not biologically or practically plausible. Biomechanical forces that influence duration of life have been described in the literature at various times in the 20th century (Thompson 1942; Morgan 1994), with a recent presentation of this line of reasoning by Olshansky, Carnes and Butler (2001). Classic examples of the problem of life-limiting body design includes the wearing out of the hip and knee joints and the age-dependent loss of bone, neurons and muscle (especially those of the heart), which makes it extremely difficult to operate our bodies much longer than is already the case.

There is growing evidence that stochastic forces have a significant influence on duration of life (Kirkwood and Finch 2000). As an example, genetically identical mice raised under identical laboratory conditions do not all die on the same day as one might hypothesize. Instead, their distribution of death is indistinguishable from that experienced by genetically heterogeneous mice living under the same conditions (Carnes and Olshansky 2001). Stochastic events, by definition, are random in time, location and effect. They contribute to the systemic age-dependent degradations in functional integrity observed at virtually every level of biological organization (Carnes and Olshansky 1997; Shock

1957). The spatial and temporal unpredictability of stochastic effects make them exceedingly difficult targets for intervention. As such, they pose a formidable challenge to efforts aimed at extending duration of life beyond what has already been achieved in low mortality populations. An aging phenotype (pathology profile and pattern of mortality) that is consistent across many species, including humans, has lead realists to suggest that the body of an organism is subject to a biological warranty period and the expiration date of that warranty establishes a biological “limit” to the duration of life (Carnes et al. 2003).

The evolutionary theory of senescence provides realists with a foundation for understanding why there are biological “limits” to the duration of life (Hamilton 1966; Kirkwood 1977; Medawar 1952; Williams 1957). According to evolution theory, senescence originates from biological factors that evolved for other reasons. Evolution theory suggests that mortality pressures within the environments of earth create a race between reproduction and death. For example, prey animals like mice that are under intense mortality pressures must achieve sexual maturity within a month in order to ensure that their genes are passed onto the next generation. By contrast, a species like humans that is subject to low mortality pressures gives birth to altricial young that take up to 15 years to achieve sexual maturity. From this perspective, genes are all about producing a healthy and vigorous sexually mature individual capable of successful reproduction. Thus, while there are biological clocks, those clocks do not regulate aging – they orchestrate growth, development and maturation. As such, genetic forces that contribute to senescence are an inadvertent by-product of genetic programs that evolved for purposes unrelated to aging. If anything, aging is the result of evolutionary neglect rather than intent because the forces of evolution (natural selection) do not operate in the post-reproductive region of the lifespan. Senescence may best be viewed as a shadow cast by a statue. The only way one can modify the shadow (senescence) is to modify the statue (biology).

The optimists and futurists base their reasoning and forecasts on speculation that rapid projected increases in life expectancy in this century will be the product of 1) a continuous development of progressively more superior biomedical technologies that do not yet exist, 2) improvements in health

behaviors that are invariably limited at the population level by non-compliance, 3) extrapolations of historical trends in life expectancy into the future coupled with an assumption that these trends are irreversible and 4) the suggestion that older people alive today (who certainly live longer on average than previous generations) are products of uniquely favorable life experiences among these cohorts when they were younger. The realists suggest that it is possible to speculate on the health of future elderly cohorts by examining them today, when they are young. For example, one recent study suggests that today’s younger generation in the U.S. and elsewhere is progressing toward levels of obesity that could lead to declines in life expectancy at birth by the middle of this century – possibly counteracting the anticipated benefits in longevity expected from advances in biomedical technology (Olshansky et al. 2005).

A potential weakness of the realist’s argument is their assumption that behavior modification and existing near-term biomedical technologies will have only a limited beneficial effect on life expectancy. In order to exceed these “limits,” the realists require the development and broad scale dissemination of the very technologies that the futurists and optimists believe are forthcoming. No one, however, knows with certainty how much more death rates can decline in the absence of futuristic life-extending biomedical breakthroughs. Similarly, there is no way to predict how much higher life expectancy can rise if interventions that slow the biological processes of aging are discovered and widely implemented.

What will be the Future of Human Longevity?

It should be evident to the reader that the authors of this chapter place themselves within the realist school of thought. Why do we believe that the futurists and optimists are making untenable assumptions that should not be used by government agencies, actuaries, or insurance industries in order to develop forecasts of life expectancy? What is our opinion on the future of human longevity and why do we think it is correct? In the following sections we provide a more detailed presentation of our line of reasoning.

Intimations of Immortality

In our opinion, the futurists' writings read like a science fiction novel; there is no scientific basis for their claims that humans are on the verge of immortality. Proclamations that dramatic extensions of life are imminent have been made for thousands of years by people who Gerald Gruman (1966), the physician and medical historian, referred to as *prolongevists*. There is no reason to suspect the fate of the modern *prolongevists* will be any different than their predecessors. Contrary to their predictions, *prolongevists* die at ages characteristic of their cohort.

Driving with a Rear View Mirror

The ease of implementing the extrapolation model of the optimists has made it attractive to both actuaries and demographers and there is a history and logic behind this approach that provides it with an intuitive appeal (Bongaarts 2006). Ironically, we believe the flaw in this approach to forecasting is what would appear at first glance to be one of its principal strengths. Namely, a dependence on a long time series of mortality change that has proven to be a reliable barometer of past and recent changes in life expectancy. The problem lies in the assumption that mortality change in the 21st century will be just like that experienced in the 20th century. Most of the rise in life expectancy over the last century was a product of declining early age mortality – saving the lives of children and mothers during childbirth. However, mortality declines of this kind can only occur once in a low mortality population, although indeed it is true that they must be repeated for each generation. Thus, life expectancy gains in the 21st century, if they are to even approach the large gains observed in the last century, will require a source of mortality decline that is fundamentally different from that responsible for past trends. Further, if large increases in life expectancy are to occur in this century, the mathematical realities of the life table will require declines in mortality at old ages that are of a far greater magnitude than the reductions in early age mortality that drove the first longevity revolution.

Another key premise of the optimists approach is that it requires a new source of mortality decline in the 21st century. They assume that an accelerating pace

of advances in biomedical technology will become the driving force for dramatically lower death rates among future cohorts of older persons. However, even the proponents of this approach to forecasting acknowledge that this assumption requires new and more effective life-extending technologies that do not currently exist. Three difficult goals must be achieved in order to fulfill the expectations of this assumption. First, these yet-to-be-discovered interventions must yield extremely large reductions in death rates from the major causes of death – heart disease, cancer and stroke. Second, a way to dramatically slow the aging process must also be found – a breakthrough of unprecedented proportions that may be plausible but which has not yet occurred. Finally, not only must these interventions be invented but they must also be distributed to a huge number of people in order to have the dramatic effect on life expectancy that they envision.

The lack of theoretical justification or empirical evidence to support most of these “beliefs” illustrates why we believe this school of thought has made untenable assumptions. Despite an awareness of the scientific literature on the biology of aging and death, the optimists persist in their assumption that there are no demographic or biological reasons why death rates cannot decline to zero (Wilmoth 2001). They also continue to argue that in the absence of evidence, there is no reason to alter their assumption that the future will repeat the past. In both cases, the overwhelming evidence that death is a biological phenomenon and that biology (growth, development, maturation, reproduction, somatic maintenance, homeostasis, disease expression and aging) is largely responsible for the timing of death, are ignored. This biological blind spot is an impediment to the biodemographic thinking that is necessary to understand the mortality consequences of aging and to make plausible forecasts of mortality, especially in low mortality populations where these biological forces are becoming increasingly more important (Carnes 2007).

Proponents of the extrapolation approach also favor incorporating cohort information into their forecasts. For example, recent improvements in some measures of morbidity and disability have been observed for the U.S. population (Manton et al. 1995, 2006) – a phenomenon attributed in part to improvements in education among successive birth cohorts. The implication being that the observed trend toward improved health status at older ages will continue if successive birth

cohorts passing through the age structure are more highly educated than those that precede them. Finch and Crimmins (2004) postulated reasonably that a “cohort morbidity phenotype” exists that is a product of early-life exposures to infectious diseases and chronic inflammatory responses. This cohort phenomenon is postulated as a partial explanation for why successive birth cohorts are experiencing progressively lower old age mortality. Neither of these phenomena could have been envisaged if the researchers had chosen to ignore these unique cohort experiences in favor of a simple extrapolation of health and longevity based exclusively on past trends. If it is reasonable to speculate that improvements in the health and longevity of older people alive today are products of uniquely favorable life experiences when they were younger, then it is equally reasonable to speculate about the health and longevity attributes of future cohorts of older persons based on observations of poor lifestyles and rising levels of obesity among the younger generation(s) of today.

Obesity

After remaining relatively stable in the 1960s and 1970s, the prevalence of obesity among adults in the U.S. increased by approximately fifty per cent per decade throughout the 1980s and 1990s (Flegal et al. 2002). In the latest estimates of overweight and obesity for the United States derived from national survey data (NHANES) that include actual measures of height and body weight (Ogden et al. 2006), 17.1 per cent of children and adolescents were overweight and 32.2 per cent of adults were obese as of 2004. The prevalence of overweight in female children and adolescents rose from 13.8 per cent in 1999–2000 to 16.0 per cent in 2003–2004, while for male children the prevalence of overweight rose during this time period from 14.0 to 18.2 per cent. Among men, the prevalence of obesity increased significantly from 27.5 per cent in 1999–2000 to 31.1 per cent by 2003–2004. Among women, no significant increase in obesity was observed between 1999–2000 and 2003–2004 – but the proportion of obese was already at an extremely high level of just over 33 per cent. The prevalence of extreme obesity (BMI \geq 40) in 2003–2004 was 2.8 per cent in men and 6.9 per cent in women. In 2003–2004, approximately 30 per cent of non-Hispanic white adults were obese

as were 45.0 per cent of non-Hispanic black adults and 36.8 per cent of Mexican Americans. Combining overweight and obese categories, fully two-thirds of adults in the U.S. today are considered to have body weight above healthful levels. The distribution of BMI has shifted in a skewed fashion such that the proportion of individuals with extreme obesity has increased at an especially rapid rate (Freedman et al. 2002). These trends have affected all major racial-ethnic groups, all regions of the country and all socioeconomic strata (Mokdad et al. 2001).

Trends in obesity are especially dramatic in children (Ogden et al. 2002). Since 1960 in the U.S. rates of obesity among boys aged 6–11 years increased to twelve per cent among whites, seventeen per cent in non-Hispanic blacks and twenty-seven per cent in Hispanics. For girls aged 6–11 the respective figures are twelve per cent in whites, twenty-two per cent in non-Hispanic blacks and twenty per cent in Hispanics. Ogden et al. (2006) have documented the recent dramatic increases in the prevalence of obesity among children observed during the latest two NHANES surveys from 1999–2000 to 2003–2004.

Obesity is a multi-system risk factor with known medical consequences. Increasing BMI is associated with an elevated risk of a number of adverse health conditions such as type 2 diabetes (mean prevalence ratios, depending on age and degree of obesity ranging from 2.56 to 18.08 in men and from 2.19 to 12.87 in women), coronary heart disease (1.14 to 2.22 in men and 1.58–2.98 in women), gall bladder disease (4.08–21.11 in men and 2.56–5.20 in women) and a variety of other complications. Adolescent obesity not only raises the risk of adult obesity and leads to a higher risk of cardiovascular and all-cause mortality in middle ages (van Dam et al. 2006), childhood and adolescent obesity also lead to a variety of immediate, sometimes life-threatening complications (Must et al. 1999). Children who are obese with type II diabetes have been shown to have the cardiovascular system of middle aged men (Gungor et al. 2005). Similarly, overweight and obesity in children have been associated with musculoskeletal disorders involving the hip, back, knee, foot and ankle and now there is reason to believe they also negatively influence skeletal alignment, muscular conditioning and soft tissue structures such as tendons, fascia and cartilage (Wearing et al. 2006). Obesity adversely affects quality of life in children, with a severity roughly equal to that of cancer (Schwimmer et al. 2003).

The effect of body weight on mortality rate has been extensively assessed. In a recent study of more than 90 thousand women from the Woman's Health Initiative Observational Study, it was demonstrated that the risk of death rises steadily and significantly with higher levels of BMI above normal and that the subsequent rise in all-cause mortality and cardiovascular mortality and incidence is mediated by the elevated risk of diabetes, hypertension and hyperlipidemia (McTigue et al. 2006). In a study of more than one million adults in the U.S., the lowest death rates were found among men with a BMI of 23.5 to 24.9 and in women with a BMI of from 22.0 to 23.4. Death rates from cardiovascular diseases were substantially elevated among people in the upper ranges of BMI (Calle et al. 1999, McTigue et al. 2006). In a prospective study of more than 1.2 million people from Korea aged 30 to 95, the risk of death from atherosclerotic cardiovascular disease and cancer rose steadily as BMI increased above the level of 24.9 (Jee et al. 2006). A prospective cohort study of 52,029 Japanese men and women from 1995–1998 found that both overweight and obesity were positively correlated with a significantly increased risk of total mortality and cancer deaths (Kuriyama 2006). A prospective study of 6,139 subjects in Germany found the greatest obesity-associated excess mortality to be among the young. The standardized mortality ratio (SMR) for individuals aged 18–29 years with a BMI of 40 or above was 4.2 in men and 3.8 in women (Bender et al. 1999). Using three large national surveys, Fontaine et al. (2003) estimated the effect of obesity on years-of-life-lost (YLL) across the lifespan of adults. For any degree of excessive body weight, young age was associated with greater YLL. Among whites age 20–30 years, YLL due to severe obesity (BMI > 45) was 13 for men and 8 for women. Being overweight in childhood was found to directly increase the risk of all-cause and cardiovascular disease-specific mortality in men and cardiovascular morbidity in both genders in a follow-up of the Harvard Growth Study of 1922–1935 (Must et al. 1992). Finally, a recent study using the National Health Interview Survey linked to the National Death Index found that from 1990 to 1992 through 1995, obese men and women in the U.S. lost 1.9 million and 3.4 million quality-adjusted life years, respectively, per year (Muennig et al. 2006).

The rising prevalence of obesity is likely to lead to an elevated risk of a broad range of fatal and non-fatal conditions for people of all ages in the coming

decades. The dramatic increase in obesity among the young is particularly disturbing since such trends have the potential to significantly elevate age-specific death rates among future cohorts of middle aged and older persons. A recent autopsy study of the grade of coronary occlusion among a large number of decedents who died before age 65 from extrinsic causes reveals a reversal in the secular trend toward improving signs of coronary artery disease (CAD) (Nemetz et al. 2007), suggesting that today's middle-aged cohorts in the U.S. could face higher risks of CAD than previous generations (Olshansky and Persky 2007). This observation has been associated with the rise in obesity but this conclusion is speculative. If left unchecked, the rise in obesity has the potential to exert a significant negative influence on life expectancy at middle and older ages in the coming decades (Olshansky et al. 2005).

Several facts suggest that as today's younger cohorts age, obesity and its complications will worsen and obesity-induced death rates will rise: 1) estimates of the impact of eliminating obesity for the population alive today are based on past trends when the prevalence was much lower; 2) obesity prevalence, especially among children, is likely to continue to rise given the trends already observed at very young ages (e.g., under age 10); 3) with obesity occurring at younger ages, the children and young adults of today will carry and express obesity-related health and mortality risks for more of their lifespan than previous generations; 4) there has been a significant shift toward higher ranges of BMI at all ages; 5) death rates from diabetes have risen steadily in the last 20 years and there is reason to suspect this trend will continue as younger cohorts age; and 6) the medical treatment of obesity has been largely unsuccessful (Ebbeling et al. 2002). These trends suggest the relative influence of obesity on the life expectancy of future generations could be markedly worse in the coming decades as the overweight and obese who are now at younger ages carry their elevated risks of death into middle and older ages.

Diabetes

A recent forecast of death rates for diabetes in the U.S. made by the SSA illustrates the problem with forecasts that are based on extrapolation or which invoke hypothetical interventions (Bell and Miller

2002). From 1979 to 1999, death rates from diabetes increased annually by an average of 2.83 per cent for males and 1.78 per cent for females. In 1990, the negative effect of diabetes on life expectancy was 0.22 years and 0.31 years for males and females, respectively. The negative impact of diabetes has risen sharply since then (NCHS 1999) and could be as much as 5–6 times greater than in 1990 (Manuel and Schultz 2004). Given the biomedical realities of a worsening obesity epidemic and its implications for diabetes, an assumption that death rates from diabetes will begin declining in the year 2010 by 1.0–3.2 per cent annually and continue this decline throughout the 21st century cannot be justified. The rationale to support this view is the presumption that diabetes will fall largely within the control of biomedical technology within the next five years and that these interventions will not only be developed but will also be widely available during the next fifty years. Although we share their aspirations for these biomedical advancements, the question remains as to whether forecasts should be based on what is currently observable, or on assumptions that depend not only on the development of interventions but also on their efficacy and their widespread availability.

Infectious Diseases

Between 1980 and 1992 in the U.S., the age-adjusted death rate from infectious diseases rose by 39 per cent; overall infectious disease mortality increased 4.8 per cent annually from 1980 to 1995 (Armstrong et al. 1999); hospital-acquired infections have increased (Diekema et al. 2003; Osmon et al. 2003); and recent decreases in HIV-related mortality have leveled off (Karon et al. 2001). The negative influence of infectious diseases on life expectancy could rise to much higher levels if, as anticipated, pandemic influenza strikes (WHO 1999). Although developing and developed nations are potentially far more vulnerable to a global pandemic of influenza today than in 1918 due to population aging, antibiotic resistance, more rapid transport of microbes, etc. (Olshansky et al. 2000), this heightened risk is balanced, in part, by better global surveillance and interventions already present (Olshansky et al. 1997). Although estimating the negative effects of epidemics on future life expectancy is

problematic, we already know from experience that when infectious diseases do re-emerge, as they have in many of today's developing nations; they can wipe out a century's worth of health and longevity gains in less than one generation (United Nations 2003). There is sufficient evidence from developed nations like the U.S. and the U.K. to suggest that even low mortality populations could experience a significant increase in infectious disease mortality in the coming decades (Olshansky et al. 2000). Thus, while the duration of the negative effect of a pandemic flu on life expectancy might be short-term, the magnitude of that effect could be dramatic.

Physiological Constraints on Duration of Life

It has been suggested that there is no demographic evidence from recent trends in mortality for the existence of limits on the life expectancy of human populations, or that low mortality populations are approaching such limits if they do exist (Manton et al. 1991; Wilmoth 1997, 1998). It has been further suggested that there are no biological or demographic reasons why death rates for humans cannot decline to zero (Wilmoth 2001). If death rates for humans can decline to zero, then limits cannot exist for either the life span of individuals or the life expectancy of populations. Further, if most humans are biologically capable of living to say 100 years or more, then there should be little evidence of significant functional decline or pathologic anomaly among people living to average survival times (75–80 years) that are already being attained. The same logic should apply to other species as well.

In a recent publication, Carnes et al. (2003) examined age-related changes in reproduction, physiological function and the pathology observed at death of the mouse, dog and human in order to determine whether biological changes consistent with the effects of aging could be detected. The goal was to determine whether this biological evidence was more consistent with bodies capable of much longer survival as anticipated by the optimists and futurists, or with bodies that the realists suggest have approached or are approaching the expiration date of their biological warranty period (Olshansky et al. 1998).

The data for female mice demonstrate that indicators of reproductive senescence (diminishing litter size, increasing pre-weaning pup mortality and parity intervals) were detectable at ages that were only 1/3 of the median age at death for the mouse strains examined. The reproductive data for human females from a broad range of fertility and mortality backgrounds demonstrate that by 35 years of age approximately 75 per cent of the reproduction that will ever be accomplished, has been accomplished. Just like female mice, this reproductive age window (and its associated reproductive physiology) for human females opens and closes at ages that are far younger than the life expectancy at birth currently achieved by women in low mortality countries (80 years). In addition, this age pattern of female fertility is remarkably similar for high mortality, low mortality and natural fertility populations. These data suggest that like female mice, the reproductive biology of human females is well defined and follows a stable and highly predictable time course. If evolutionary theories of aging are correct, the temporal dynamics of aging and death are intimately linked to the reproductive components of a species life history strategy (Stearns 1992). The largely immutable reproductive biology observed for female mice and humans and the predictable age patterns of their respective mortality (Carnes et al. 1996) are consistent with bodies that are subject to biological warranty periods.

The post-reproductive period is a segment of the life span typically associated with a loss of functional integrity (Fries 1980). Consistent with this expectation, studies on a wide range of physiological parameters reveal that approximately 80 per cent of functional capacity in humans is lost by age 80. Because there is no aging or death program (Hayflick 2000), the age-dependent rate of loss of some but not all of this lost functional capacity can be reduced through exercise, diet and with medications (Fiatarone and Evans 1990; Bortz 1982). Nevertheless, the biological evidence seems clear; the widespread degradation of physiological function (vital capacity) over time is yet another finding that is consistent with the existence of biological warranty periods.

The data on the pathology burdens observed at death provide incontrovertible evidence that age takes a severe toll on the bodies of dogs, mice and humans. Using nothing more than this pathology profile, we demonstrated that it is possible to statistically dis-

tinguish animals that died old from those that died young. Although death certificate data for humans are far less reliable than the pathology diagnoses available for laboratory animals, the pathology implications are no less conclusive. For humans dying over the age of 80, every organ system has a greater burden of disease involvement (abnormal pathology) than was observed in people dying before age 50. As with the reproductive and physiology data, humans have an age-related pathology burden that is consistent with bodies that are subject to biological warranty periods that limit the duration of life.

In summary, extrapolation models have been used to argue that there are no biological, demographic, or other reasons why death rates cannot decline to zero and that there is no reason why life expectancies for human populations cannot rise to 100 years or more. We have provided biological evidence for the mouse, dog and human that leads to the conclusion that there are biological warranty periods for living things that influence how long they are capable of living. The reproductive biology of mice and humans and the duration of life estimates derived from these data do not support predictions of human life expectancies rising to 100 years in this century.

From the evidence available, implied warranty periods exist for the duration of life. Although aging and death cannot be programmed by natural selection, they are a predictable byproduct of stable life history strategies that evolved under environments far less conducive to survival than those experienced today. The relatively benign environments that have been created through human ingenuity (e.g., public health, medical care, technology) are already permitting people to achieve and even exceed the expiration dates of their personal warranty periods. The fact that aging is not programmed and bodies are not designed to fail makes it possible to exploit loopholes in the biological contract of life in order to alter many of the parameters of aging and manufacture survival time (Olshansky et al. 1998). However, once most people have achieved their personal life span potential, it becomes extremely difficult to overcome the inherent limitations of their biology. Although life expectancy limits for humans have certainly not yet been reached, the evidence suggests that the biological warranty periods for human bodies are considerably lower than the estimates of 100+ year life expectancies generated by purely mathematical models.

Biodemographic Constraints on Duration of Life

The measure of period life expectancy at birth is calculated from age-specific death rates for a country observed during a calendar year. At its heart, life expectancy is based on the number of person-years-of-life lived in successive age groups by a hypothetical cohort. This number can increase rapidly, as it did in the early 20th century in today's developed nations, when it begins from a lower level and when declines in death rates occur at younger ages. As life expectancy at birth reaches higher levels, it becomes increasingly more difficult to raise it further as person-years-of-life must then be added by reducing death among middle aged and older persons (Olshansky et al. 1990).

One argument used by the optimists to support their view that life expectancy will rise to 100 years in this century is that large reductions in death rates, just like those observed in the 20th century, are on the verge of occurring again. Although the optimists never specify how or why such declines in death rates might occur, they nevertheless make the argument that they are a predictable outcome of forthcoming advances in the biomedical sciences. We have demonstrated that if the large declines in death rates that occurred in the past were to occur again, including large declines in death rates at middle and older ages, then the rise in life expectancy today would be much smaller in the future than what was observed during the 20th century (Olshansky et al. 2001). For example, if all of the reductions in death rates observed throughout the 20th century occurred again from levels of mortality present in 1995, life expectancy at birth would rise by only 10.1 years instead of the 30.1 years experienced during the previous century. If a third equivalent set of large declines in mortality occurred again, the rise in life expectancy would be only 6.1 years.

Finally, a third way to illustrate biodemographic constraints on human life expectancy is to illustrate how much death rates would have to decline in order to raise life expectancy at birth from current levels, to much higher levels. According to Olshansky et al. (1990), death rates at all ages would have to decline by more than 85 per cent from all causes combined in order for life expectancy at birth to rise to 100 years – a feat requiring more than the hypothetical elimination of cancer, all cardiovascular diseases and diabetes

combined. Thus, the prediction by Oeppen and Vaupel (2002) that life expectancy will reach 100 years in the U.S. by 2060 requires not only the development and widespread dissemination of currently non-existent ways of slowing the process of aging in people, but humanity would also have to discover a cure for the vast majority of the chronic killer diseases that exist today.

Biomechanical Constraints on Duration of Life

The human body can be thought of as a collection of pulleys, pumps, levers and hinges that operate much like a machine (Olshansky et al. 2001). While a mechanic can repair worn out parts of a car, a bewildering array of coordinated biological processes exist to maintain and repair the human body. Despite this remarkable teamwork, our maintenance and repair capacities are both limited and imperfect. Constraints on the duration of life imposed by body design and the biology that animates it should be obvious to even the most casual reader. For example, humans begin losing bone density (osteopenia) at about age 30. Although this process can be slowed and with medication bone loss can even be reversed, the significant loss of bone density that has already occurred among middle aged and older persons today will hamper their prospects for dramatic increases in duration of life. In addition, two types of essential cells in the body have either a limited or no capacity for regeneration – muscle cells and nerve cells in the brain. At present, the only known way to partially compensate for the age-dependent loss of muscle mass (sarcopenia) is through exercise. However, this intervention cannot reclaim lost muscle cells (it increases the size of those that remain), nor can it reverse the inevitable transition from fast twitch to slow twitch muscles fibers that occurs as we age. Similarly, the age-dependent loss of neurons and a suite of related neurological disorders are largely untreatable at this time. The current reality of aging is that age-determined immutable and progressive degradations of function like those just described are characteristic of virtually every aspect of human biology. There is, therefore, overwhelming scientific evidence for the existence of intrinsic biological constraints on the duration of life – evidence

that directly contradicts the suggestion that there are no biological reasons why death rates cannot decline to zero (Wilmoth 2001).

Is There a Biological Limit to Life?

This question and its answer are perhaps two of the most misunderstood concepts in the field of aging today. Some scientists and many in the lay public have come to a mistaken belief in the existence of a genetically determined biological barrier or wall that precludes further increases in human life expectancy (for a summary of this view see Carnes and Olshansky 2007). In attempts to refute the evolutionary biology perspective of senescence, some researchers (e.g., Vaupel 1997) misinterpreted the theory by incorrectly predicting that a “black hole” of genetic diseases should exist at the beginning of the post reproductive region of the lifespan. Both views are incorrect. In an attempt to prevent the perpetuation of these mistaken beliefs, we will take a moment to explain the evolutionary theory of senescence and briefly discuss its implications for the future of human life expectancy.

The origin of modern evolutionary theories of senescence dates back to the theory of aging set forth by biologist August Weismann (1891). According to Weismann, the one aspect of life that could not be avoided was the inevitable exposure of individuals to forces within the world around them that produce a constant barrage of small but accumulating injuries to the body. In his view, it was also unrealistic to expect that these injuries could be repaired perfectly. This logic led him to the realization that the solution to this dilemma was to replace old worn out bodies with new undamaged ones. In other words, reproduction is the solution to the inevitability of aging and death. Thus, even if immortality was theoretically possible, it could never be realized in the real world where the external forces of injury and death were (and still are) ubiquitous and unavoidable.

Another advance for theories of senescence was provided by the late Nobel laureate Sir Peter Medawar (1952), who combined genetics and evolutionary theory in order to propose a mechanism of aging. Like Weismann, Medawar invoked the importance of the ever-present external force of mortality, which was identified as the primary reason why most organisms in nature do

not live long enough to experience senescence. Like other scientists then and now, Medawar considered mutations (departures from the normal state) to genes as almost always deleterious to the health and vigor of the individual carrying that mutation. His unique contribution was thinking through the ramifications of the timing of gene expression. For example, a mutated gene (allele) expressed before the age of sexual maturation would likely diminish the ability of the individual carrying that allele to reproduce. As such, the frequency of this allele in the gene pool of the population should be lower than related alleles having less or no negative impact on health and vigor. In fact, the rarity of these early expressing alleles should be inversely proportional to the severity of their effect. In essence, natural selection punishes alleles (i.e., reduces their frequency) that have negative impacts on reproduction with a severity that diminishes to a vanishing point as the time of gene expression reaches the ages when reproduction ceases.

Medawar recognized the implications of this selection scenario for senescence. The post-reproductive period is characterized by evolutionary neglect because selection is blind to the consequences of allelic variations in gene expression at these ages. Medawar’s language was more colorful, he described the post-reproductive period as a “genetic dustbin” where adverse gene expression, good or bad, has no effect on reproduction. It is, however, easy to see how adverse gene expression could contribute to the senescent diseases and disorders occurring at these ages. The effectiveness of selection is a diminishing trajectory, not a step function of either being present or absent. Further, genetic variation is just that, variation that exists among alleles within a gene locus as well as variation in expression that exists between gene loci. The temporal dynamics of this genetic scenario are simply incompatible with the prediction of deleterious effects concentrated within a “black hole” at the beginning of the post-reproductive period.

Williams (1957) provided an important extension of Medawar’s view of aging when he hypothesized that some of the genes that have adverse health effects later in the lifespan may exist because they play important roles in growth and development early in the lifespan. His insights provided a second genetic modality for senescence. In addition to mutated genes expressed later in life, senescence could also be the result of normal genes being expressed at

abnormal times (e.g. oncogenes are often involved in growth and development). Williams described this phenomenon of early beneficial effects and late damaging effects as antagonistic pleiotropy. Antagonistic pleiotropy could also be achieved by a normal gene being inappropriately turned on (i.e. loss of regulation) in the post-reproductive period. This latter modality was referred to as the disdifferentiative hypothesis of aging and cancer by Cutler and Semsei (1989).

One of the more recent extensions of the evolutionary theory of senescence appeared in a series of articles published by Kirkwood (1977) and Kirkwood and Holliday (1979). Like Weismann and Medawar, Kirkwood also argued that the inevitable forces of external mortality play a crucial role in the timing of senescence. As discussed earlier, the solution to the inevitability of death is reproduction. Sexually reproducing organisms must invest energy into converting a fertilized egg into a sexually mature individual within a timeframe where the probability of successful reproduction exceeds the risk of death established by the forces of external mortality. This biological imperative creates a balancing act between investment in either reproduction or the maintenance and repair needed for longer life. Thus, species experiencing high levels of mortality (most organisms) must invest more into reproduction and less into somatic maintenance. Whereas species facing lower levels of mortality (e.g., predators and animals that have found ways to evade predators) can lessen their investment in reproduction and spend more of their physiological capital on processes necessary for longer life. This economic perspective of aging is called the “disposable soma” theory of senescence and it has made it possible to organize existing theories of senescence into a more coherent and integrated conceptual framework.

In summary, the argument that natural selection alters the genetic composition of a population through the differential reproductive success of individuals is a basic tenet of modern evolutionary biology. The corollary of this tenet is that the opportunity for selection to alter gene frequencies is greatest before individuals begin reproducing, diminishes as the cumulative reproductive potential of individuals is achieved and becomes weak or nonexistent once reproduction has ceased. This age-based gradient for the effectiveness of selection has an extremely important consequence;

it permits the life course of species to be partitioned into biologically meaningful and comparable time periods – the pre-reproductive, reproductive and post-reproductive periods.

The biological consequences of this partition are equally profound. When the normally high force of external mortality is controlled and survival beyond the end of the reproductive period becomes a common occurrence, senescence and senescent-related diseases and disorders have the opportunity to be expressed. Since selection does not operate in the post-reproductive period, there can be no genetic basis for either immortality or senescence that arises from the direct action of natural selection. As such, organisms are not designed to fail but neither are they designed for extended operation. Instead, senescent-related diseases and disorders are an inadvertent byproduct of a rare and irrelevant event in nature – survival into the post-reproductive period of the life span (Hamilton 1966). Investing physiological capital into maintaining the soma beyond the ages needed for reproduction, nurturing offspring and improving the reproductive success of those offspring (grandparenting) would be an unnecessary and unwise investment. Thus, from a biological perspective, aging arose as an inevitable and inescapable byproduct of life’s ingenious and necessary solution to the inevitability of death.

Are there genes that influence aging? The answer to this complicated question is important to understanding the prospects for genetic interventions that the optimists and futurists are depending on to produce large increases in life expectancy. As we have demonstrated, duration of life is dictated by the time needed for maturation, reproduction, nurturing and grandparenting for some species. This race between reproduction and death is so crucial that it cannot be left up to chance. As a result, growth and development involve highly regulated genetic programs (Carnes et al. 1996). Since it is a race against time, there is no question that the tempos of these growth and development programs are driven by extremely precise and highly coordinated biological clocks. It is easy to see how these clocks could be misinterpreted as clocks for aging. However, every gene involved in this exquisitely complex process is designed for health and vigor, not sickness and decay. You can think of the duration of this process as a biological warranty period. As such, aging or senescence is the unintended byproduct of bodies surviving

to and/or beyond the expiration of this warranty period (Carnes et al. 2003).

Thus, while there are no genes whose purpose is to establish a biological limit to life, neither is there a biology whose purpose is to achieve indefinite survival. As such, the bodies produced by this biology have a characteristic period of operation that in the collective can be expressed as probabilistic limits on duration of life.

Genetic interventions that extend life by influencing the expression of specific gene-linked diseases will undoubtedly be discovered. Aging, however, is a systemic process affecting every molecule of the human body. Battles against specific diseases will be won, the life span potential of humans will be extended but in the end, entropy will still win the war (Carnes et al. 2008). The feasibility, ethics and desirability of interventions capable of dramatically extending human life will be a never ending subject of intense debate.

Conclusions

There is an appealing but superficial logic that permeates the purely mathematical approaches to forecasting human life expectancy and investigating limits on the life spans of individuals and the life expectancy of populations. In all of the purely mathematical approaches there is no age when the probability of survival becomes zero. In other words, no matter how old an individual becomes, there is a non-zero probability that the individual can survive one more day. When taken to its illogical extreme, this reasoning leads to the biologically untenable conclusion that there are no limits on how long individuals can live and therefore there can be no limits on how high the life expectancy of populations can climb.

The optimists have suggested that human life expectancy has no biological limits and that the pathway to projecting the future is to simply extend the historical trend forward in time. Their approach to extrapolation has led them to predict that life expectancy at birth in the United States will rise to 100 years in this century. As a result, they have recommended that governments should raise their forecasts of life expectancy to be in accord with their prediction. It is our contention that the data and methods used by the optimists are inappropriate, their assumptions are unrealistic and their

predictions are biologically implausible. By ignoring the extensive biological evidence that duration of life is limited; the optimists also reject the unavoidable demographic conclusion derived from that evidence – namely, that life expectancy must also be limited. Their misunderstanding of evolutionary theories of senescence has led them to invalid predictions about the temporal kinetics of genetic diseases in humans. By ignoring the relationship between form and function; optimists also ignore the currently unavoidable biomechanical senescence (enervation, sarcopenia, osteopenia) of the human body that imposes limits on the functioning of both the body and mind. Their optimistic predictions are driven by assumptions that as yet undiscovered advances in the biomedical sciences will simultaneously: 1) lead to the near elimination of the main causes of death today, 2) delay senescence for most people in developed countries and 3) be provided on such a broad scale as to influence a population-level measure such as life expectancy. Finally, their optimistic mortality scenarios for the future ignore a global obesity epidemic that is already in progress, alarming increases in infectious diseases and the threat of an anticipated pandemic that is overdue; all of which represent formidable obstacles to uninterrupted future increases in life expectancy.

It is important to recognize that the optimists assume that when the historical trend in a particular variable associated with life expectancy favors a projected increase – as in the case of creating a record composite life expectancy at birth – then the presumption is that the future will be like the past. However, when the historical trend in a particular variable associated with life expectancy favors a projected decline – as in the case of undeniable and measurable increases in the risk of death from diabetes, obesity and infectious diseases – the optimists invoke the anticipated development of hypothetical advances in biomedical technologies to fix the problems. If the historical record of health and longevity is to be used to inform forecasts of life expectancy, it should not be invoked selectively to favor one particular point of view – it should be invoked without bias.

Finally, it is important to acknowledge that the optimists and futurists have one argument in their favor – it is impossible to know with certainty whether anticipated advances in the biomedical sciences will yield an intervention that slows aging in people and if it does how much it might influence life expectancy.

What is known is that there is a concerted effort to find the means to slow aging in people and now there is reason to be optimistic that such developments will occur in this century (Olshansky et al. 2006). Exactly how much of an impact such an advance will have on life expectancy is uncertain but what should be encouraging for all three camps is that our mutual dream of a shift in the pattern of old-age mortality may be on the horizon. On this most important of all points, it is evident that the proponents of all three views of the future of human longevity can come together in agreement.

References

- Allard M, Lebre V, Robine JM (1998) The longest life: The 122 extraordinary years of Jeanne Calment. W.H. Freeman and Co, New York
- Armstrong GL, Conn LA, Pinner RW (1999) Trends in infectious disease mortality in the United States during the 20th century. *JAMA* 281(1):61–66
- Austad S (1999) Why we age: What science is discovering about the body's journey through life. John Wiley and Sons, New York
- Bell FC, Miller ML (2002) Life tables for the United States social security area 1900–2100. Actuarial Study No. 116, Social Security Administration, Washington, DC
- Bender R, Jockel KH, Trautner C, Spraul M, Berger M (1999) Effect of age on excess mortality in obesity. *JAMA* 281:1498–1504
- Bongaarts J (2006) How long will we live? *Popul Dev Rev* 32(4):605–628
- Bortz WM (1982) Disuse and aging. *JAMA* 248(10):1203–1208
- Calle EE, Thun MJ, Petrelli JM, Rodriguez C, Heath, Jr. CW (1999) Body-mass index and mortality in a prospective cohort of U.S. adults. *N Engl J Med* 341:1097–1105
- Carnes BA (2004) Darwinian bodies in a Lamarckian world. *Gerontologist* 44:274–279
- Carnes BA (2007) Senescence as viewed through the lens of comparative biology. *Ann NY Acad Sci* 114:14–22
- Carnes BA, Olshansky SJ (1997) A biologically motivated partitioning of mortality. *Exp Gerontol* 32:615–631
- Carnes BA, Olshansky SJ (2001) Heterogeneity and its biodemographic implications for longevity and mortality. *Exp Gerontol* 36:419–430
- Carnes BA, Olshansky SJ, Grahn D (2003) Biological evidence for limits to the duration of life. *Biogerontology* 4(1):31–45
- Carnes BA, Olshansky SJ, Grahn D (2007) A realist view of aging, mortality, and future longevity. *Popul Dev Rev* 33(2):367–381
- Carnes BA, Olshansky SJ, Grahn D (1996) Continuing the search for a law of mortality. *Popul Dev Rev* 22(2):231–264
- Carnes BA, Holden LR, Olshansky SJ, Witten TM, Siegel JS. (2006) Mortality partitions and their relevance to research on senescence. *Biogerontology* 7:183–198
- Carnes BA, Statts DO, Sonntag, WE (2008) Does senescence give risk to disease? *Mech Aging Dev* (in press)
- Cutler RG, Semsei I (1989) Development, cancer and aging: Possible common mechanisms of action and regulation. *J Gerontol: Biol Sci* 44(6):25–34
- de Grey A (2005) Foreseeable and more distant rejuvenation therapies. In: Rattan S (ed) *Aging interventions and therapies*, World Scientific, Singapore
- de Grey A et al (2002) Time to talk SENS: critiquing the immutability of human aging. *Ann NY Acad Sci* 959:452–462
- Diekema DJ, Beekmann SE, Chapin KC, Morel KA, Munson E, Doern GV (2003) Epidemiology and outcome of nosocomial and community-onset bloodstream infection. *J Clin Microbiol* 41(8):3655–3660
- Ebbeling CB, Pawlak DB, Ludwig DS (2002) Childhood obesity: Public-health crisis, common sense cure. *Lancet* 360:473–482
- Fiatarone MA, Evans WJ (1990) Exercise in the oldest old. *Topics Geriatr Rehabil* 5(2):63–77
- Finch CE, Crimmins EM (2004) Inflammatory exposure and historical changes in human life-spans. *Science* 305:1736–1739
- Flegal KM, Carroll MD, Ogden CL, Johnson CL (2002) Prevalence and trends in obesity among US adults, 1999–2000. *JAMA* 288:1723–1727
- Fontaine KR, Redden DT, Wang C, Westfall AO, Allison DB (2003) Years of life lost due to obesity. *JAMA* 289:187–193
- Freedman DS, Khan LK, Serdula MK, et al (2002) Trends and correlates of class 3 obesity in the United States from 1990 through 2000. *JAMA* 288:1758–1761
- Fries JF (1980) Aging, natural death, and the compression of morbidity. *N Engl J Med* 303:130–135
- Gruman GJ (1966) A history of ideas about the prolongation of life: The evolution of prolongevity hypotheses to 1800. *Trans Am Phil Soc* 56(9)
- Gungor N, Thompson T, Sutton-Tyrrell K, Janosky J, Arslanian S (2005) Early signs of cardiovascular disease in youth with obesity and type 2 Diabetes. *Diabetes Care* 28:1219–1221
- Hamilton WD (1966) The moulding of senescence by natural selection. *J Theor Biol* 12:12–45
- Hayflick L (2000) The future of ageing. *Nature* 408:267–269
- Holliday R (2007) *Ageing: The paradox of life*. Springer Publishing, New York
- Jee SA, Sull JW, Park J, et al (2006) Body-mass index and mortality in Korean men and women. *NEJM* 355:779–787
- Karon KM, Fleming PL, Steketee RW, De Cock KM (2001) HIV in the United States at the turn of the century: An epidemic in transition. *Am J Public Health* 91:1016–1017
- Kirkwood TBL (1977) Evolution of aging. *Nature* 270:301–304
- Kirkwood T (2003) Time of our lives: the science of human aging. Oxford University Press, Oxford
- Kirkwood T, Finch C (2000) *Change, development and ageing*. Oxford University Press, Oxford
- Kirkwood TBL, Holliday R (1979) The evolution of ageing and longevity. *Proc R Soc Lond B Biol Sci* 205:531–546
- Kuriyama S (2006) Impact of overweight and obesity on medical care costs, all-cause mortality, and the risk of cancer in Japan. *J Epidemiol* 16(4):139–144
- Kurzweil R, Grossman T (2004) *Fantastic voyage: Live long enough to live forever*. Rodale Press, Emmaus, PA
- Kurzweil R (2005) *The singularity is near: When humans transcend biology*. Viking Press, New York
- Manton KG, Stallard E, Tolley HD (1991) Limits to human life expectancy. *Popul Dev Rev* 17(4):603–637
- Manton KG, Stallard E, Corder LS (1995) Changes in morbidity and chronic disability in the US elderly population: Evidence

- from the 1982, 1984, and 1989 national long term care surveys. *J Gerontol B Psychol Sci Soc Sci* 50(4):S194–S204
- Manuel DG, Schultz SE (2004) Health-related quality of life and health-adjusted life expectancy of people with diabetes in Ontario, Canada, 1996–1997. *Diabetes Care* 27(2):407–414
- McNeill WH. (1976) *Plagues and peoples*. Anchor, Garden City
- McTigue K, Larson JC, Valoski A, et al (2006) Mortality and cardiac and vascular outcomes in extremely obese women. *JAMA* 296(1):79–86
- Medawar PB (1952) *An unsolved problem of biology*. Lewis, London
- Mokdad AH, Bowman BA, Ford ES, Vinicor F, Marks JS, Koplan JP (2001) The continuing epidemics of obesity and diabetes in the United States. *JAMA* 286:1195–2000
- Morgan A (1994) *The scars of evolution: What our bodies tell us about human origins*. Oxford University Press, Oxford
- Muennig P, Lubetkin E, Jia H, Franks P (2006) Gender and burden of disease attributable to obesity. *AJPH* 96(9):1662–1668
- Must A, Jacques PF, Dallal GE, Bajema CJ, Dietz WH (1992) Long-term morbidity and mortality of overweight adolescents. A follow-up of the Harvard Growth Study of 1922 to 1935. *N Engl J Med* 327:1350–1355
- Must A, Spadano J, Coakley EH, Field AE, Colditz G, Dietz WH (1999) The disease burden associated with overweight and obesity. *JAMA* 282:1523–1529
- National Center for Health Statistics (1999) *United States life tables eliminating certain causes of death, 1989–1991, vol 4, No. 1*. DHHS (PHS) 99-1150-4
- Nemetz PN, Roger VL, Ransom JE, Bailey KR, Leibson CL (2007) Recent trends in the prevalence of coronary disease: A population-based autopsy study of non-natural deaths. *Arch Intern Med* 261, 264–270
- Oeppen J, Vaupel J (2002) Broken limits to life expectancy. *Science* 296(5570):1029–1031
- Ogden CL, Flegal KM, Carroll MD, Johnson CL (2002) Prevalence and trends in overweight among US children and adolescents, 1999–2000. *JAMA* 288:1728–1732
- Ogden CL, Carroll MD, Curtin LR, McDowell MA, Tabak CJ, Flegal KM (2006) Prevalence of overweight and obesity in the United States, 1999–2004. *JAMA* 295:1549–1555
- Olshansky SJ, Carnes BA (2001) *The quest for immortality*. Norton, New York
- Olshansky SJ, Persky V (2007) The canary in the coal mine of coronary Artery Disease. *Arch Intern Med* 168(3):261
- Olshansky SJ, Carnes BA, Cassel C (1990) In search of methuselah: Estimating the upper limits to human longevity. *Science* 250:634–640
- Olshansky SJ, Carnes BA, Rogers RA, Smith L (1997) Infectious diseases: New and ancient threats to world health. *Popul Bull* 52(2):1–58
- Olshansky SJ, Carnes BA, Grahn D (1998) Confronting the boundaries of human longevity. *Am Sci* 86(1):52–61
- Olshansky SJ, Rogers RG, Carnes BA, Smith L (2000) Emerging infectious diseases: The fifth stage of the epidemiologic transition? *World Health Stat Q* 51(2,3,4):207–217
- Olshansky SJ, Carnes BA, Butler R (2001) If humans were built to last. *Sci Am* 284(3):50–55
- Olshansky SJ, Carnes BA, Désesquelles A (2001) Prospects for human longevity. *Science* 291(5508):1491–1492
- Olshansky SJ, Hayflick L, Carnes BA, et al (2002) Position statement on human aging. *Sci Am* (June), <http://www.sciam.com/agingstatement.cfm> (Also published in the *J Gerontol: Biol Sci* 57A(8):B1–B6)
- Olshansky SJ, Passaro D, Hershov R, Layden J, Carnes, BA, Brody J, Hayflick L, Butler, RN, Allison, DB, Ludwig, DS. (2005) A potential decline in life expectancy in the United States in the 21st century. *New Engl J Med* 352:1103–1110
- Olshansky SJ, Perry D, Miller RA, Butler RN (2006) In pursuit of the longevity dividend. *Scientist* 20(3):28–36
- Omran A. (1971) The epidemiologic transition: A theory of the epidemiology of population change. *Milbank Mem Fund Q* 49:509–538
- Osmon S, Warren D, Seiler SM, Shannon W, Fraser VJ, Kollef MH (2003) The influence of infection on hospital mortality for patients requiring greater than 48 hours of intensive care. *Chest* 124(3):1021–1029
- Schwimmer JB, Burwinkle TM, Varni JW (2003) Health-related quality of life of severely obese children and adolescents. *JAMA* 289:1813–1819
- Shock N. (1957) Age changes in some physiologic processes. *Geriatrics* 12:40–48
- Stearns SC (1992) *The Evolution of life histories*. Oxford University Press, New York
- Thompson DW (1942) *On growth and form*. Dover Publications, New York
- Tuljapurkar S, Li N, Boe C (2000) A universal pattern of mortality decline in G7 countries. *Nature* 405:789–792
- United Nations (2003) *The impact of AIDS*. Population Division, ESA/P/WP.185, New York
- Van Dam RM, Willett WC, Manson JE, Hu FB (2006) The relationship between overweight in adolescence and premature death in women. *Ann Intern Med* 145:91–97
- Vaupel J (1997) Trajectories of mortality at advanced ages. In: Wachter K, Finch C, (ed) *Between Zeus and the salmon*. National Academy Press, Washington, DC, pp 17–37
- Warner H et al (2005) Science fact and the SENS agenda: What can we reasonably expect from ageing research? *EMBO Rep* 6:1006–1008. Doi: 10.1038/sj.embor.7400555
- Wearing SC, Hennig EM, Byrne NM, Steele JR, Hills AP (2006) Musculoskeletal disorders associated with obesity: A biomechanical perspective. *Obes Rev* 7:239–250
- Weismann A (1891) *Essays upon heredity and kindred biological problems*. Clarendon Press, Oxford
- Williams GC (1957) Pleiotropy, natural selection and the evolution of senescence. *Evolution* 11:398–411
- Wilmoth J (1997) In search of limits. In: Wachter K, Finch C, (ed) *Between Zeus and the salmon*, Washington, DC, National Academy Press, pp 38–64
- Wilmoth J (1998) The future of human longevity: A demographer's perspective. *Science* 280:395–397
- Wilmoth J (2001) How long can we live? *Science debate*; <http://www.sciencemag.org/cgi/eletters/291/5508/1491>
- Wilmoth JR, Deegan LJ, Lundstrom H, Horiuchi S (2000) Increase of maximum life-span in Sweden: 1861–1999. *Science* 289:2366–2368
- World Health Organization (1999) *Influenza pandemic plan. The role of WHO and guidelines for national and regional planning*. WHO/CDS/CSR/EDC/99.1

Chapter 34

Experience, Social Structure and Later Life: Meaning and Old Age in an Aging Society

Dale Dannefer and Robin Shura

Introduction

By definition the work of demographers entails not only analytical detachment but also the existential reductionism of personally momentous events to single datapoints. It may seem paradoxical that the assemblage of such discrete and singular bits of information for a society's population can reveal patterns that provide key insights into the character of both intimate and complex aspects of individual experience and of cultural ideals. Indeed, it is not possible to understand social change in either the domains of the cultural (the collective symbolization of ideas and values) or the personal (the meaning-making processes and struggles within individuals' everyday lives) without understanding demographic patterns and their role in shaping the domains of culture, value and individual opportunity. Nowhere can the impact of demographic patterns on ideas, values and meaning be more clearly seen than in the matter of human age.

A discussion of the meaning of age and old age depends first of all upon a clear definition and theoretical understanding of meaning. Meaning can be defined as an actor's *interpretation of a phenomenon and its location in relation to other phenomena*. It is a process by which the nature and significance of a phenomenon are identified, and this identification always and necessarily occurs in the context of an overall and more or less coherent *Weltanschauung*, a worldview, a cognitive system by which an actor organizes her world.

The systems of symbols that comprise culture are inherently meaningful, and cultural symbol systems – the most universal and foundational form of which is language – are internalized by actors from their earliest interactions with other humans. Thus, meaning is inherently dynamic: meanings change as actors change their interpretation of a phenomenon in response to changed conditions. This is exactly what has happened to the meaning of age with the momentous technical and demographic changes of the past two centuries.

It is not possible in the space of this brief paper to provide a comprehensive analysis of meanings attached to old age, nor to provide an exhaustive comparative or global perspective on the topic of meaning of late life. Our goal will be to examine meaning in relation to structural and demographic changes in aging in two distinct ways. First, we explore the meaning of old age, as the dynamic outcome of cultural and demographic developments that have resulted in a vibrant cultural ageism that reifies negative valuations of elders and old age and provides broad justification for the social marginalization and exclusion of elders. The meaning of old age is an element of culture that is broadly shared by all age groups. Second, meaning in old age focuses on the experience of being old – the embodied, experiential, active and dynamic process of human beings as they create and recreate meaning in relation to their age in their everyday lives and in micro-level interactions. We focus on how this process is socially constituted and situated within the context of a rapidly aging society that is permeated by a strong culture of ageism. In modern societies, social institutions tend to restrict activity and opportunity on the basis of age. As Matilda Riley put it, this entails structural lag, or society's failure to provide opportunities that engage elders in ways that society could benefit from their

D. Dannefer (✉)
Department of Sociology
Case Western Reserve University
10900 Euclid Avenue
Cleveland, OH 44106, USA
E-mail: dale.dannefer@case.edu

skills and energies and concurrently to provide elders themselves with opportunities for meaningful social engagement (Riley et al. 1994).

The Meaning of Old Age in an Aging Society: Cultural Idealizations of Age and Old Age

To speak of the meaning of old age in an aging society is to speak of aging in modernity (Land and Yang 2006). All modern societies have undergone a demographic transition and the concomitant transformation of the age structure brought about by dramatic reductions in both mortality and fertility rates. This process entails a long-term trend toward the squaring of the population pyramid, reflecting an ever-growing relative proportion of elders within the total population. Beyond the widespread popular attention given to the Baby Boom birth cohorts in the United States, this phenomenon of increasingly rapid population aging is a contemporary demographic trend shared across countries. Such shifts in the age structure of the population have implications for how age is perceived and valued. As may be happening for nonagenarians and centenarians today, Achenbaum (1978) suggested that increasing longevity had the effect of removing the mystique associated with elder status during a time when only a very few individuals survived to experience it. Before modern medicine redefined and elevated the social position of physicians, it was the elders themselves who were often regarded as those who had mastered health and longevity and thus understood life's secrets. In sum, elders in this earlier era were revered, held in positive social regard, credited for their longevity and often considered exemplars of life lived well and right (Achenbaum 1978).

Beyond the context of dramatic population shifts indexed by the demographic transition, the continuing transformation of modern societies has entailed a number of other changes with significant implications for aging and the meaning of old age. First, advances in science, medicine and nutrition have contributed to increasing longevity for both men and women. In fact, the demographic transition itself relied on and resulted in part from such developments. As a result, public consciousness was becoming more oriented toward the medical and technological advances that were transforming not only how we live but how long we live.

Ironically, the promise of medical progress and concomitant promise of increased life expectancy led to *more* elders while at the same time taking the credit away *from* elders for their longevity, thus taking away one reason that elders had been socially revered.

A second factor was the increasing reliance on age as a basis of social organization, stratification and control. The population growth and urbanization of the nineteenth century led to administrative concerns on the part of governments to understand and manage increasingly large and dense urban populations. Compulsory, age-graded schooling is just one response of governments that indicates the historically-new salience age had achieved for organization and regulation of social institutions (Chudacoff 1989). With the legitimation of scientific expertise claimed by psychologists and other presumed experts and reinforced by contemporaneous age-graded theories of human development, age emerged as a primary distinguishing characteristic of individuals and hence as a primary basis of social organization and a feature of social life granted cultural significance and value.

Third, rapidly occurring changes in the labor process with the advance of industrialization rendered obsolete the knowledge and skills of many of those trained in traditional agriculture or skilled trades. As Lynd and Lynd wrote in *Middletown*: "Invention and technology continue rapidly to supplant ... the cunning hand of the master craftsman by batteries of tireless iron men doing narrowly specialized things over and over and merely 'operated' or 'tended' in their orderly clangorous repetitive processes by the human worker" (1929: 39–40). Such changes were not age-neutral; rather, they increased the value of the strength and stamina of relatively unskilled younger workers and often entirely eliminated the need for the journeyman knowledge of the advanced, master craftsmen, who were also more likely to be relatively older individuals. Thus, shifts in the labor market due to industrialization and deskilling led to a preference for youthful workers and devalued elders' often advanced skills and experience, undermining their social status and economic value (see Braverman 1974/1998; Derber 1982).

Finally, with the demise of agrarian society, the economic position of elders had shifted. A reduction in agriculture and farm ownership diminished the power and status of elder farmers and landowners (Fischer 1978). Personal wealth and the control of economic production were no longer tied to land ownership. This change

reflected the expansion of the industrial economy, and it was paralleled by the institutionalization of retirement and the gradual implementation of governmental and private pension programs (Myles and Pierson 2001; Quadagno 1988; Shultz and Borowski 2006). These programs provided some economic protection of older people, but they also had the effect of marginalizing them in terms of social and economic participation. This loss of power and control over wealth was also experienced within the institution of the family. Elders' roles within the extended family declined during industrialization, as junior generations were lured away from the homestead by the economic promise of factories. As the youth of rural communities migrated elsewhere, elders – especially those without farms or other enterprises – were at risk of being left isolated (Haber 2006).

While historians continue to debate the relation of these numerous factors to each other and to changes in the status of the aged, there can be little doubt that their combined effect has been to reduce the economic power and social status of elders quite substantially over the past two centuries. These social and historical trends have contributed to the current culture of ageism, replete with meanings of old age that not merely reflect but justify and reproduce the relatively disadvantaged social positions, value and statuses afforded to elders in society.

Several scholars have challenged the continued plausibility of the negative connotations that were attached to old age through the 20th century. Peter Laslett's (1989; see also Moen and Spencer 2006) influential concept of the *third age* envisioned the postretirement years as a period of "independence, agency and self-realization" (Scourfield 2007), of freedom from work demands and societal role scripts that offer the possibility of pursuing individualized interests and enjoyment. Gillear and Higgs (2000; 2005) have been aggressive in promoting the view that retirement is increasingly a "third age" experience. They propose that the challenges posed to conventional meanings of age by the experience of the postwar Baby Boom are already having an effect on meanings of age, confounding ideas of what it means to be old (Gillear and Higgs 2000). They proposed that the new freedoms and opportunities of the postmodern world are supplanting the view that aging is a simple matter of socially organized disengagement and decline. According to this view, an array of possible activities – whether travel, other forms of consumerism, or new modes of recreation – will ultimately transform

the images, definitions and meanings of old age. In the following section, the debate surrounding this idea and the ways in which it can be illuminated by demographic and other forms of empirical analysis are discussed.

The Meaning of Old Age and the Reality of Old Age

Whether the venerated elders of traditional society, the denigrated elders of modernity, or the alleged pioneering elders of late modernity and the so-called third age, the reality of old age was likely never as homogeneous as the meanings and status associated with it imply. The old clearly included impoverished individuals as well as the richest members of society before industrialization (Demos 1978) and continued to do so in postindustrial societies (Crystal and Waehrer 1996; Dannefer and Sell 1988). Ironically, in 20th-century modernity the negative meanings attached to advanced age were paralleled by an overall economic advance for the aged (Pampel 1981; Schulz and Binstock 2006). The institutionalization of retirement depended on public and to some extent private pension plans, which reduced poverty and inequality in older cohorts. At the same time, retirement may have further reinforced a set of broadly shared images and perceptions of the aged as irrelevant, obsolete, useless and unimportant.

Uhlenberg demonstrated the social-structural realities that support such meanings of old age with the concept of "the societal significance of cohorts" (1988). He introduced this concept to demonstrate the empirically palpable social disengagement of elders. He asserts that, as a cohort ages, its societal significance, or "... the degree of control that members of the cohort exert over the lives and behavior of others in the population" [406], changes. Characteristics of a cohort – such as size, levels of physical and mental impairment, wealth and possession of socially valued skills and knowledge [413–414] – all influence a cohort's relative significance in society.

Age has become a major criterion of role entry and exit within social institutions of late modernity. Thus, cohorts are said to *flow* through social structures quite precisely calibrated by age (Riley et al. 1972; Riley 1973). This age-grading of social institutions allowed for the emergence and consistency of the institutionalized life course (ILC) in the latter half of the 20th century. Uhlenberg's

analysis makes clear that an irreducible aspect of the institutionalization of the life course is the *institutionalization of ageism*, which separates older strata of the population from other age strata and, consequently, may further solidify the view of older people as not only peripheral or marginal but also irrelevant, useless and even socially costly. In the face of the present, worldwide demographic trend of rapid population aging, the consequences of strictly age-graded social institutions for sustaining ageism are noteworthy.

Recently, questions have been raised about the future of the institutionalization of the life course and more specifically the institutionalization of retirement. Two perspectives that propose deinstitutionalization of retirement but stand in opposition to each other in terms of their description of this deinstitutionalization, may be referred to as the *third age* perspective and the *increasing inequality* perspective. The *third age perspective* is represented most prominently in the recent work of Gilleard and Higgs (2000, 2005) and an *increasing inequality* perspective is represented by analyses of the Second Demographic Transition (SDT) and associated hardships (Hughes and Waite 2007; Lesthaeghe 1995; Lesthaeghe and Neidert 2006). The former perspective focuses on the distinct experience and trajectories of the Baby Boom cohorts, whereas the latter perspective focuses on intracohort inequality and the social forces that regulate it.

Focusing on the promise of upbeat scenarios encouraged by those whose lifestyles seem to exemplify “active”, “successful”, “productive” and we might even say *innovative* aging, Gilleard and Higgs envisioned a third age in which the halcyon and energetic lifestyle experiences, expectations and demands broadly attributed to Baby Boomers will mean that they will not tolerate the negative and constricting role definitions that appeared almost normative for elders through the 20th century.

A different take on tendencies toward deinstitutionalization of the life course comes from the emerging literature on the second demographic transition. This term refers to a constellation of trends, including the relative increase in rates of divorce and rates of births outside of the institution of marriage and the concomitant increased diversity in family structures and living arrangements. These trends represent social changes so drastic in their effects on society that they comprise a *second demographic transition* (Hughes and Waite 2007; Lesthaeghe 1995; Lesthaeghe and Neidert 2006). Such forces are likely to amplify the resilient processes of cumulative

disadvantage that operate to increase inequality within each cohort as its members age (Dannefer 2003). Specifically, analysts of the SDT point to changes within family structure as well as labor markets that have profound implications for the social position of elders (Hughes and Waite 2007). Such trends will exert pressure toward the *deinstitutionalization* of the life course by imbuing a greater diversity of lifestyles and patterns of relationships, not only because of individualized and creative aging but also because of increasing intracohort inequality and for many, economic stress that requires new modes of coping in late life (Dannefer and Patterson 2007). As labor markets shift to privatize risk (Baars 2006; Dannefer 1999; O’Rand 1999), increasing inequality in job stability and retirement benefits in later adulthood may require increasing numbers of aging individuals to continue working because they cannot afford to retire. In this scenario, it is not only the *third age* RV traveler, but perhaps more typically the bridge job Wal-Mart greeter, who equally represent the 21st century experience of old age.

Despite the stark differences between these scenarios, the *third age* perspective and the SDT each suggest mechanisms through which the societal significance of older cohorts may be increased and ways in which the segregation of elders that has characterized social life of the 20th century (e.g., Chudacoff 1989; Hagestad and Uhlenberg 2005) may be reduced. Although the predictions of the *third age* and the Second Demographic Transition perspectives are quite different, if either were to be realized it could be expected to produce continued changes in the meaning of old age. In either case, for better or worse, it could be expected to signal a change toward greater activity on the part of elders. Key differences between these perspectives include the degree of voluntariness and control that older people would experience over their lives in old age and the extent to which social changes in the positions and activities of elders will either work *against* contemporary ageist meanings of old age or *reify* negative meanings by reproducing marginalization.

Meaning in Old Age in an Aging Society

The meaning of old age in an aging society is quite different from the processes of making and finding meaning for those who are actually living the experience

of being old. If meaning represents an actor's *interpretation of phenomena*, it is, irreducibly, a property of individual consciousness, albeit nested within collective consciousness about meanings of old age. This meaning is regenerated daily in the activities and interactions of everyday life. In this respect, the processes underlying meaning for those *in* old age are generic human processes of meaning-making and world-construction in everyday life. Thus, a primary principle for understanding meaning *in* old age is to recognize that it is not qualitatively or fundamentally different from meaning at any other age. It is inherent in human experience to seek meaningful relations with others, to act in consequential ways, to find significance in one's everyday life space and endeavors and to act on the basis of the meanings attributed to oneself and one's situation. Human activity represents the externalization of consciousness into action and reflects the intentionality of the actor. To say that action is intentional is to say that it is meaningful. This fundamental human experience begins in early childhood and extends through the life course. Humans give meaning to their activities, which often involve relating to others, whether at age 6 or 96. While the categories and content with which one organizes her intentionality may shift, the formation of intentions does not. The basic process of meaning-making is then fundamental to the human experience and age-neutral.

Moreover, the extent to which age is itself of any particular interest or influence in this distinctly human process of meaning-making is not inherent or naturally proscribed. Rather, how individuals *perceive* age to be relevant or influential in human activity and world construction is conditioned by features of the broader social context, which include but are not limited to opportunity structures; age norms; policies; dominant forms of knowledge including age-graded theories about human development, aging and capability; and values.

If the fundamental human process of meaning-making is age-neutral, *opportunities* for meaningful activity and interaction are not. Indeed, they are heavily constrained, not only by age-related changes in capacities but also by a socially constructed and historically recent awareness of and preoccupation with chronological age. This is especially true in late modern societies, in which age has become a central dimension of social organization that tends to reify perceived differences based on age expectations, or even to create them where they do not exist. Such distinctions involve age-

ist ideas that are institutionalized in social practices, norms, policies and various domains of expert knowledge. Examples of such institutionalized ageism are readily apparent in education, medicine, law and other institutions as an index of qualification and to define competence and eligibility.

The systematic exclusion of elders from economic productivity and social interaction more generally undermines some foundational elements in the meaning-making process. Consider for example, the broadly recognized human needs of autonomy, competence and relatedness posited by motivational psychologists (Deci and Ryan 1985). These are general and enduring human needs that do not change with age. It is noteworthy that the contemporary and rapidly expanding movement for nursing home reform is founded on the premise that *boredom*, *helplessness* and *loneliness* are the "three plagues of nursing home life" (Thomas 1996), which reflect the deprivation of these three basic needs (Dannefer et al. 2008). These plagues of nursing home life represent the dire consequences to human beings of living in a social setting that systematically denigrates elders by placing low expectations on them and, almost by definition, on their capacities for independence and social contribution. These long-term care environments severely minimize elders' opportunities for meaningful social engagement. Life for elders within a traditional, medical-model nursing home is stereotypically devoid of experiences of autonomy, affirmation of productive worth (competence) and positive and engaging connections to others – those universal and necessary conditions for the fundamental human process of meaning-making. Consideration of the forces that have created the exclusion of elders from social participation more broadly in society in a way that progressively deprives them of opportunities for social engagement and control over their everyday activities and that concurrently legitimate this deprivation, suggests that elders are faced with the task of making meaning under debilitating social conditions.

The sources of this deprivation of meaning can be understood in terms of some of the same population patterns identified in the prior section on the meaning of old age. The marginality and exclusion of elders revealed through Uhlenberg's analysis of the societal significance of cohorts provides a demographic indication of a subpopulation whose lives appear to be at risk for deficits of meaningful activity and engagement. With regard to relatedness, the network ties

of older people suggest that they are age-segregated outside of family networks, placing elders at heightened risk for social isolation (Hagestad and Uhlenberg 2006). With regard to autonomy and competence, the lack of socially organized opportunities for productive and affirming activity is a legacy of the historical shift to the institutionalized life course, retirement and the concomitant culture that denigrates elders, assuming them to be obsolete and irrelevant in a changing society and viewing them as having little of value in terms of personal resources or characteristics.

Ageism, like sexism or racism, is an active, not inert, social force that operates within micro-level interactions, within broader social structures and through symbolic systems of value and meaning. Yet to say that ageism is active does not mean that it is fully intentional; rather, it operates through the daily re-enactment or continuous reproduction of established social practices and institutions as they interact with individual and population processes. The difficult challenge that older people face in finding meaning in the important area of relatedness offers a good example of how ageism becomes reinforced as a latent consequence of institutional forces operating on a structural grid of age segregation.

One significant and relentless source of social isolation and personal loneliness for surviving elders is the loss of long-time friends and other loved ones. On this point it is important to analyze consequences to cohorts of flowing through strictly age-graded social institutions over their collective life courses, particularly consequences experienced in old age. Like the young, social networks or convoys of the old typically are relatively age homogenous. Within a population in which more people are living longer and the risk of death is concentrated in later life, the social ties of the old begin to deplete due to death at a relatively fast rate. Situations in which elders are mourning multiple or consecutive losses of siblings, dear friends and other loved ones are not rare. One might say they have become *normative* for elders, due to a complex interplay of sustained institutional age segregation that is a definitional feature of the institutionalized life course and demographic trends in mortality and morbidity. Such dramatic losses take their toll on elders in more ways than one, including loss of key social supports, shrinking of social networks or convoys and on a very basic level becom-

ing a common and defining feature of the embodied, *lived* experience of being old.

In this context, socio-emotional selectivity theory (see, e.g., Carstensen et al. 2003), which asserts that shrinkage in social networks of elders is a rationally desirable feature of aging and old age and suggests that elders *choose* to limit their network size by selecting fewer, more intimate ties, appears descriptively accurate but limited in its conception of underlying processes and explanatory principles. To what extent do the outcomes that support socio-emotional selectivity theory have their origins in distinctly modern features of demographic age structure and age-segregated institutions and their effects on networks of elders who have lived within age-segregated social institutions throughout the life course? Similarly, it can be questioned whether socio-emotional selectivity theory gives adequate attention to the grieving many elders live through in their experiential, everyday realities in the face of concentrated loss that has become so prevalent it is considered *normative*, loss that must be understood as consequential for the individual processes of making meaning *in* old age. Clearly, decreasing social network size and the concomitant isolation, loss and grief can be seen as inevitable by-products of being one of the survivors when a cohort reaches advanced old age in a highly age-segregated social structure. Yet it also relies on a feature of social convoys and networks that is, in principle, fundamentally a construction of culture and social organization, which is the structuring of social relationships in terms of age homogeneity. Before the first demographic transition, death was not correlated with old age, and social relations were not so age-segregated (Chudacoff 1989).

Hagestad and Uhlenberg (2006) have recently documented that in the mainstream cultures of late modernity, contact between those over 65 and young adults and children outside of familial networks is almost nonexistent. Perhaps increasingly, there is clear resistance when elders attempt to forge new relationships outside of the institution of the family network, and this resistance is fueled and sustained by cultural ageism. However, this resistance is based in structural realities – the lack of extrafamilial institutionalized opportunities and support for relationships to be formed and sustained through time between elders and individuals who are significantly younger. What opportunities exist in

neighborhoods, in educational systems, in broader communities, in the political process and in the labor market for the over-80 crowd to build relationships with children or young adults? The effects of these patterns on dispositions toward older people, as well as the dispositions of older people themselves, are not difficult to discern. When one of the authors of this chapter polled an undergraduate class in human development about who they *ever* interacted with who was more than 50 years their senior, not one of 39 students mentioned any relationship but a grandparent. When asked about whether they have invited or would ever consider inviting someone 20, 30, perhaps 50 years older to join them in their preferred weekend social activities, the responses were surrounding 'no's' and incredulous laughter.

When older people themselves initiate age-integrative activities, they are likely to discover quickly the power and force of institutionalized ageism and age segregation. Without institutionalized forms of non-familial age-integrated relationships to support elders in such quests, elders who attempt to foster new cross-age relationships may encounter resistance and experience disappointment. As an example from our own experience, consider the case of an 87-year old woman who has spent the majority of her life proactively generating and sustaining relationships with people who differ from her significantly in age. Through her adult life and into her early 70s, she ran an informal and lively after-school baking club for nine neighborhood children, including some of her grandchildren and had regular contact with many neighborhood parents through this club. Now in her late 80s, she is experiencing what she considers baffling hardship in her pursuit of cross-age connections, compared to when she was in her 60s and 70s. Currently, younger adults with whom she initiates contact in her apartment community are either not interested in beginning an acquaintanceship with her, or will only come to her place but never reciprocate. Reflecting on her experience, she believes that younger adults do not consider friendship with someone her age palatable: they do not seem to consider a new friendship with a woman who is *so old* desirable.

Loss, grief and relative isolation, then, have become normative features of old age in late modern society, *not* because they are inevitable outcomes of universal processes of human aging and disengagement. Rather, loss, grief and social isolation have

become challenges to meaning-making *in* old age due to a convergence of social forces that have organized both social experience and physical longevity on the basis of age.

Imagine, as a counterposed ideal type, a society in which close friendships are based on Matilda Riley's model of the age-integrated life course (Riley and Riley 1994). In such a society, friendships and other social relationships would be readily formed across, as well as within, age strata. In such a scenario, loss would be a lifelong constant, as friends would include elders who would eventually die and the experience of loss of close friends would generally not be so concentrated in later life. While such a society may seem at first unlikely, it should be remembered that the age-segregated structures currently taken for granted and assumed to be natural have emerged as human practices only within the last two centuries, with the expansion of industrialization, bureaucratization and medicalization. As noted earlier, a concomitant of the expansion of bureaucratization in the 19th and 20th centuries, with its penchant for using age as an organizing principle, was the expansion of rigid age norms (Chudacoff 1989). Even earlier than G. Stanley Hall's writings of a century ago on adolescence (1904), the expectations attached to these age norms have been reified and legitimated by oversimplified and misleading stage theories of human development (e.g., Erikson 1978; Guttmann 1987; Levinson 1978, 1994) that exist in denial of cultural and historical variation in patterns of human development, aging and social relations (see, e.g., Dannefer 1984; Kett 1977; Morss 1990).

Whatever advantages may have been claimed for the sociopolitical reliance on age as a principle of social organization, one clear cost relative to the pre-modern period was the emergence of age segregation and with it the unnecessary and wasteful separation of people who could have much to gain from each other on the basis of age. Of particular concern is how the exclusion of elders from social engagement continues to influence meaning *in* the lived experiences of elders and how expanded opportunities for age integration could afford elders increased social affirmation and opportunities to experience autonomy, competence and relatedness. Beyond meaning *in* their old age, such expanded opportunities for age integration could have ripple effects, bringing enrichment to others, communities and society at large.

Conclusion

Meanings of age are provided in socially shared and institutionalized idealizations that become accepted, taken-for-granted aspects of cultural knowledge. The awareness of age defined by such idealizations has become much stronger and the idealizations of old age have become more explicit, more precisely calibrated and socially consequential with the social transformations accompanying the industrial revolution. This process has been accelerated further in postindustrial late modernity. In this context, the meaning of old age is located in a broader system of the meaning of age that is defined by the institutionalized life course. The broad categories of this tripartite age-differentiated framework provide the grid within which differential evaluations can be made and within which youth is generally seen as desirable and old age is denigrated. In the 21st century, aging Baby Boomers in the United States as well as the larger cohorts advancing into old age elsewhere in the world will continue to shift population age structures and will be confronted both by new opportunities and aspirations and new risks and demands. It cannot be predicted precisely how the changing conditions of the 21st century will affect the activities of elders, their social relations and their social definition and status. However, if broader societal forces encourage higher levels of activity and social engagement of elders, it will likely have an effect on the meanings attributed to old age.

Meaning *in* old age is constructed by each aging individual within the context of these broader social definitions, opportunities and constraints. As noted earlier, the opportunities and constraints confronting older people have varied dramatically historically and it appears likely that forces of deinstitutionalization will increase inequality and diversity in later life in the decades ahead. Yet meaning *in* old age has itself become more socially and existentially problematic even as longevity has increased and the economic situation of elders has improved. Age segregation and the exclusion and marginalization of elders from productive social activity have contributed substantially to the problematic character of meaning *in* old age. For better or worse, the ferment expected to derive from worldwide population aging may provide opportunities for redefining and refram-

ing the meaning of old age and with it, the nature of opportunities for finding meaning *in* old age in an aging society.

References

- Achenbaum AW (1978) Old age in the new land: The American experience since 1790. Johns Hopkins University Press, Baltimore, MD
- Baars J (2006) Beyond neomodernism, antimodernism, and postmodernism: Basic categories for contemporary critical gerontology. In: Baars J et al (eds) Aging, globalization and inequality: The new critical gerontology, Amityville. Baywood, NY pp 17–42
- Braverman H (1974/1998) Labor and monopoly capital: The degradation of work in the twentieth century, 25th anniversary edition. Monthly Review Press, New York, NY
- Carstensen LL, Fung HH, Charles ST (2003) Socioemotional selectivity theory and the regulation of emotion in the second half of life. *Motiv Emot* 27(2):103–123
- Chudacoff H (1989) How old are you? Age consciousness in America. Princeton University Press, Princeton, NJ
- Crystal S, Waehrer K (1996) Late life economic inequality in longitudinal perspective. *J Gerontol Soc Sci* 51B:S307–S318
- Dannefer D (1984) Adult development and social theory: A paradigmatic reappraisal. *Am Sociol Rev* 49:100–116
- Dannefer D (1999) Bringing risk back in: The regulation of the self in the postmodern state. In: Schaie KW, Hendricks J (eds) The evolution of the aging self: The societal impact on the aging process. Springer, New York
- Dannefer D (2003) Cumulative advantage/disadvantage and the life course: Cross-fertilizing age and social science theory. *J Gerontol* 58B(6):S327–S337
- Dannefer D, Patterson RS (2007) The second demographic transition, aging families, and the aging of the institutionalized life course. In: Uhlenberg P, Schaie KW (eds) Impact of demographic changes on health and wellbeing in the elderly. Springer, New York pp 212–229
- Dannefer D, Sell RR (1988) Age structure, the life course and aged heterogeneity: Prospects for theory and research. *Compr Gerontol* 2:1–10
- Dannefer D, Stein P, Siders R, Patterson RS (2008) Is that all there is? The concept of care and the dialectic of critique. *J Aging Studies* 22:101–108 (April)
- Deci EL, Ryan RM (1985) Intrinsic motivation and self-determination in human behavior. Plenum Publishing, New York
- Demos J (1978) Old age in early New England. *AJS* 84: (Supplement: Turning Points: Historical and Sociological Essays on the Family) S248–S287
- Derber C (1982) Professionals as workers: Mental labor in advanced capitalism. GK Hall, Boston, MA
- Erikson EH (1978) Adulthood. WW Norton, New York, NY
- Fischer DH (1978) Growing old in America. Oxford University Press, Oxford
- Gilleard C, Higgs P (2000) Cultures of ageing: Self, citizen and the body. Prentice Hall, Harlow, England
- Gilleard C, Higgs P (2005) Contexts of ageing: Class, cohort and community. Polity, Cambridge, UK

- Guttman D (1987) *Reclaimed powers: Toward a new psychology of men and women in later life*. Basic Books, New York
- Haber C (2006) Old age through the lens of family history. In: Binstock RH, George LK (eds) *Handbook of aging and the social sciences*, 6th edn. Elsevier, Burlington, MA pp 59–75
- Hall GS (1904) *Adolescence: Its psychology and its relations to physiology, anthropology, sociology, sex, crime, religion, and education*. 2 vols. Appleton, New York
- Hagestad GO, Uhlenberg P (2005) The social separation of old and young: A root of ageism. *J Soc Issues* 61:343–360
- Hagestad GO, Uhlenberg P (2006) Should we be concerned about age segregation? Some theoretical and empirical explorations. *Res Aging* 28(6):638–653
- Hughes ME, Waite L (2007) The aging of the second demographic transition. In: Uhlenberg P, Schaie KW (eds) *Impact of demographic changes on health and wellbeing in the elderly*. Springer, New York pp 179–211
- Kett J (1977) *Rites of passage: Adolescence in America: 1790 to the present*. Basic Books, New York
- Land KC, Yang Y (2006) Morbidity, disability and mortality. In: Binstock RH, George LK (eds) *Handbook of aging and the social sciences*, 6th edn. Elsevier, Burlington, MA pp 41–58
- Laslett P (1989) *A fresh map of life: The emergence of the third age*. Weidenfeld & Nicolson, London
- Lesthaeghe R (1995) The second demographic transition in western countries: An interpretation. In: Mason KO, Jensen A-M (eds) *Gender and family change in industrialized countries*. Clarendon Press, Oxford, UK pp 17–62
- Lesthaeghe R, Neidert L (2006) The second demographic transition in the United States: Exception or textbook example? *Popul Dev Rev* 32(4):669–698
- Levinson DJ (1978) *The seasons of a man's life*. Knopf, New York, NY
- Levinson DJ, Levinson JD (1994) *The seasons of a woman's life*. Knopf, New York, NY
- Lynd RS, Lynd HM (1929) *Middletown: A study in American culture*. Harcourt, Brace & World, New York, NY
- Moen P, Spencer D (2006) Converging divergences in age, gender, health, and well-being: Strategic selection in the third age. In: Binstock RH, George LK (eds) *Handbook of aging and the social sciences*, 6th edn. Elsevier, Burlington, MA
- Morss J (1990) *The biologising of childhood: Developmental psychology and the Darwinian myth*. Psychology Press, New York, NY, pp 127–144
- Myles J, Pierson P (2001) The comparative political economy of pension reform. In: Pierson P (ed) *The new politics of the welfare state*. Oxford University Press, Oxford, pp 302–333
- O'Rand AM (1999) Risk, rationality, and modernity: Social policy and the aging self. In: Schaie KW, Hendricks J (eds) *The evolution of the aging self: The societal impact on the aging process*. Springer, New York
- Pampel FC (1981) *Social change and the aged: Recent trends in the United States*. Lexington Books, Lexington, MA
- Quadagno JS (1988) *The transformation of old age security: Class and politics in the American welfare state*. University of Chicago Press, Chicago, IL
- Riley MW (1973) Aging and cohort succession: Interpretations and misinterpretations. *Public Opinion Quarterly* 37: 35–49
- Riley MW, Johnson M, Foner A (1972) *Aging and society, Vol. III: A sociology of age stratification*. Sage, New York
- Riley MW, Kahn RL, Foner A (1994) *Age and structural lag: Society's failure to provide meaningful opportunities in work, family, and leisure*. Wiley, New York
- Riley MW, Riley JW Jr (1994) Age integration and the lives of older people. *Gerontologist* 34(1):110–115
- Schulz JH, Binstock RH (2006) *Aging nation: The economics and politics of growing older in America*. Praeger, Westport, CT
- Schulz JH, Borowski A (2006) Economic security in retirement: Reshaping the public-private pension mix. In: Binstock RH, George LK (eds) *Handbook of aging and the social sciences*, 6th edn. Elsevier, Burlington, MA, pp 360–379
- Scourfield P (2007) Helping older people in residential care remain full citizens. *Br J Soc Work* 37:1135–1152
- Thomas W (1996) *Life worth living: How someone you love can still enjoy life in a nursing home*. Van der Wyk & Burnham, Acton, MA
- Uhlenberg P (1988) Aging and the societal significance of cohorts. In: Birren JE, Bengtson VL (eds) *Emergent theories of aging*. Springer, New York, pp 405–424

Index

1911 Fertility Census and the 1946 Family Census
in Great Britain, 678
1911 Scottish Census, 679
1930s, 677, 680
1950s, 684
401k's, 432, 439

A

Active life expectancy, 3, 543, 571, 575
African Americans, of, 547
American Indians, of, 548
Asians, of, 548
cancer and, 551
circulatory disease and, 551
cognitive function and, 559
diabetes and, 552
education and, 548
expectations of disability and, 550
future research into, 559
heart disease and, 551
Hispanics, of, 548
implications for practice of, 559
income and, 548
medical care and, 552
modifiability of, 558
musculoskeletal conditions and, 551
obesity and, 550
plasticity, 558
rural residence and, 549
smoking and, 550
socioeconomic status and, 548
survey design, 560
technology and, 557
urban residence and, 549
women, of, 547
Activities of Daily Living (ADLs), 143, 264, 550, 569–571, 636
Activity limitations, 389
Adapting to Population Aging, 16
Administrative costs, 614, 615, 619, 620
Adverse selection, 634
Africa, 56, 253, 367, 383
African Union's Policy Framework and Plan of Action on
Ageing, 260
African-Americans, 376

Age

composition, 138
discrimination, 59, 463
in Employment Act (ADEA), 463
distribution, 1, 2
earnings profiles, 494
job performance and, 460
misreporting, 577
pyramid, 13
related health problems, 460
reporting, 388
schedules of fertility, 10
segregation, 4, 752–754
selection, 396
sex
distributions and, 179
structures and, 397, 402
specific death rate, 526
structure, 40, 41, 52, 56, 135, 279, 366, 376, 395, 396, 398
changes over time, 291
families, of, 7
populations, of, 279, 280
world population, of the, 9
Aged Dependency Ratio (ADR), 49–51, 184
Ageism, 747, 749–753
Aggregate income, 496
Aging, 277, 399, 400–402, 731–735, 738–744
aged, of the, 45
crisis, 191, 192, 223
demography of, 277
Health and Retirement (AGIR), 28
index, 49–51, 113
policy, 145
population, 278, 396, 399, 400, 401
society, 402, 403
trajectories, 157
transition, 157
Aid to Families with Dependent Children (AFDC), 412
AIDS/HIV, 15
Allostasis, 692
stress, 692
recovery, 692
Almshouses, 407
Alone, 95, 99

- Amenity-seeking, 355
 - moves, 353
- American Way, 416
- Americans for Generational Equity (AGE), 413
- Ansley Coale, 397
- Arab countries, 2
 - listed, 278
- Area of residence, 239, 244
 - rural, 244, 247
 - urban, 244, 247
 - urban-rural differences in, 234
- Argentina, 10
- Arthritis, 264
- Arthur, 398, 399
- Asia, 57, 365, 367, 383
- Asian, 402
 - countries, 133, 147
 - Pacific Islanders, and, 376
- Assets, 244, 379, 494, 506, 508, 510, 512, 514
 - holding, 148
 - reallocations of, 151, 153
- Assisted living, 633
- Assistive Technology, 660
- Association-managed Health Insurance Plan, 139
- Asylum seekers, 403
- Asymptote, 174, 175
- Attitudes, 76, 357
- Attrition, 716
- Auguste Comte, 173
- Australia, 10, 45, 48, 49, 54, 374, 403
- Austria, 45, 383
- Availability of kin, 654
- Average remaining life expectancy, 16
- B**
- Baby boom, 9, 46, 54, 191–193, 196, 199, 203, 204, 208, 212, 213, 218, 221, 222, 224, 225, 418, 648, 650
 - generation, 631
 - period, 134
- Baby boomers, 136, 354, 360, 641
 - Later-Life Migration, and, 336
- Balkan, 403
- Barbados, 396, 397
- Barcelona initiative, 467
- Basic State Pension, 424
- Bedridden, 140
- Behavioral factors, 589, 591
- Below replacement
 - fertility, 41, 42, 52, 53, 398, 399
 - populations, 399
- Benin, 253
- Bequests, 510, 517
- Berlin aging study, 676
- Biodemography, 731–733, 735, 740
- Birth
 - cohorts, 179
 - control, 678
 - to Twenty Study, 270
- Births, 10
- Black report, 589
- Black–white crossover, 577
- Border control, 370
- Bouvier, 398
- Brazil, 10, 42, 57
- Bridge
 - employment, 450
 - Jobs, 450
- Bubble economy, 136
- Bulgaria, 400
- Burkina Faso, 253
- C**
- CABG, 640
- Canada, 2, 10, 45, 48, 54, 374, 378, 379, 384, 387, 403
- Cardiac surgery, 632
- Care, 91, 101, 103
- Caregivers, 101, 103, 107, 108, 654
- Caregiving, 101, 103, 208, 219, 220, 222, 224, 655
- Carers, 101, 108
- Caribbean, 383
- Cash balance plans, 507
- Causal relationship between income and health, 599
- Cause-Specific Older Adult Mortality, 532
- Census, 261
 - Bureau, 398
- Centenarians, 27
- Center for Epidemiologic Studies Depression (CES-D) scale, 717
- Centers for the Demography of Aging, 28
- Changing
 - Lives of Older Couples (CLOC) study, 715
 - Nature of Work, 462
- Characteristics of Older Workers, 453
- Childbearing, 396
 - Incentives, 145
- Childless, 3
 - as a noncategory, 682
- Childlessness, 3, 70, 97, 98, 648, 649, 652, 671
 - rates among men, 675
- Chile, 10
- Chilean model, 430
- China, 2, 9, 45–47, 49, 57, 154, 376, 384, 400
 - Health and Nutrition Survey (CHNS), 24
 - retirement policy, 486, 487
- China's, 175
- Chinese, 384
- Choice biography, 679
- Chronic
 - conditions, 577
 - disease, 576
- Chronological ageing, 260
- Cicero's, 37
- Citizenship, 350, 371, 372
- Civil
 - Rights Act, 463
 - war pension, 407
- Class differences, 104
- Closed populations, 395
- Cluster analysis, 52
- Coale, 398
- Cognitive
 - functioning, 460
 - impairment, 570

- Cohabitation, 651, 654
 - Cohort component approach, 174
 - Colombia, 376
 - Colonial America, 407
 - Committee on Economic Security, 408
 - Community, 62, 63
 - Companionate marriage, 678
 - Comparative research, 21, 23
 - descriptive, 21
 - outcomes, 21
 - processes, 22
 - Comparative Study of Aging and Health in Asia (AHA), 24
 - Compensation, 493, 495, 498, 499, 501, 503, 506
 - Composition, 395, 402
 - Compression of morbidity, 257, 522, 545, 554, 578
 - Condiciones de Salud de los Adultos de Edad Mayor (PREHCO), 236
 - Conditions, 243
 - childhood, 233
 - chronic, 233, 243, 250
 - Confucian ideology, 178
 - Consensual unions, 93
 - Contacts, 76
 - Contraception, 396
 - Coresidence, 94, 95, 100, 108, 244
 - Cost of Living Allowances (COLAs), 411
 - Costs of older workers, 459
 - Côte d'Ivoire, 253
 - Council of European Social Science Data Archives, 30
 - Countries of origin, 376
 - Covenant marriage, 694
 - Crime, 225
 - Crimmins, E.M., 548
 - Crisis
 - model, 695
 - period, 695
 - Cross-sectional, 19
 - Cross-national
 - comparisons, 607, 610, 616, 628
 - Equivalent File (CNEF), 23
 - Crude
 - birth rate, 178
 - death rate, 526
 - Cuba, 400
 - Cultural preferences, 383
 - Cumulative
 - disadvantage theory, 593, 594
 - effects, 592
- D**
- Data
 - census, 278
 - quality, 388
 - sources of, 278
 - DB, 503–507
 - DC, 503, 505–507
 - Death rates, 135, 175, 388
 - Declines
 - disability, in, 650, 651
 - mortality and fertility, of, 158
 - fertility, of, 648
 - Deferred compensation, 501
 - Defined
 - benefit, 415
 - contribution, 613, 614, 619, 624
 - plans, 449
 - Degenerative disease, 135
 - Delays in marriage, 677
 - Demand for Labor, The, 462
 - Dementia, 264, 651
 - Demographic, 49
 - aging, 41, 46
 - change, 191, 192, 202, 218, *see also* population change
 - composition, 396
 - dividend, 15, 257
 - Health Surveys (SHS), and, 261, 278, 280, 675
 - profile, 261
 - older population, of the, 261
 - projections, 129
 - transition, 1, 2, 12, 13, 37, 39–41, 52, 53, 61, 64, 134, 158, 176, 191–193, 196, 208, 232, 236, 238, 254, 255
 - trends, 631
 - Demography, 647
 - journals, 27
 - Denmark, 51
 - Dependency
 - aged, of the, 179
 - burden, 183
 - ratio, 8, 9, 40, 173, 179, 184, 185, 221, 222
 - transition, 342
 - Dependents, 495, 500, 502
 - benefits, 409
 - Pension Act, 407
 - Depression, 264, 407, 674, 697, 717
 - prior to marriage, 698
 - Developing countries, 38, 59
 - Devolution of risk, 430, 435
 - Diabetes, 234, 264
 - Diffusion of health technologies, 641
 - Disability, 3, 256, 257, 264, 384, 460, 567–580
 - Adjusted Life
 - Expectancy, 579
 - Years (DALY's), 128, 578
 - benefits, 410
 - free life expectancy, 543, 573, 579
 - rates, 574, 631
 - transition, 257
 - trends, 650
 - Disabled workers, 500
 - Disablement, 568, 569, 574
 - process, 568
 - Discouraged workers, 455
 - Disordered cohort flow, 62
 - Disparate impact, 464
 - Distance, 100
 - Diversity, 493, 516
 - Divorce, 96, 651, 654, 694
 - acrimony in, 694
 - emotional distress of, 695, 697
 - alcohol abuse and, 697
 - financial consequences of, 695
 - immune function of, 695

- longevity, 693
 - women, of, 693
 - rate, 694
- Dominican Republic, 376
- Dual-nationality marriages, 355
- Dynamic equilibrium, 257
 - theory, 545, 555
- Dynamics of populations that undergo changing demographic rates, 13
- E**
- Early life
 - experiences, 592
 - factors, 592
- Early twentieth century cohorts, 674, 685
- Earnings, 378, 416, 494–498, 500–508, 510, 512, 514, 515
- Earth Day, 397
- East Asia, 42, 45, 54, 57
 - Southeast Asia, and, 133
- Eastern Europe, 51, 54, 57
- Economic
 - consequences of aging, 7
 - effects of population aging, 16
 - growth, 134
 - problem, 17
- Education, 16, 244, 246–248, 261, 494, 495, 498, 500, 501, 517
- Educational Patterns of Older Adult Mortality, 534
- Efficiency, 499, 516
- Egypt, 56
- Elder
 - care, 169
 - child ratio, 113
- Elderly, 135
 - caregiving, 157
 - women, 46
- Elizabethan Poor Law, 407
- Emergency sources of care, 655
- Emigrants, 396, 397
- Emigration, 91, 374, 380, 396, 397, 402
- Emotional
 - health, 697
 - reactivity, 718
- Employees' Pension Scheme (EPS), 138
- Employer
 - attitudes toward older workers, 461
 - pensions, 379
- Employment, 60, 263, 445
 - foreign migrants as live-in home carers, of, 83
- Empty-nesters, 671
- End of life, 637, 641
 - care, 643
 - expenditures, 634, 636, 641–643
- Endogeneity, 637, 642
- England, 637
- English
 - language proficiency, 380–382, 384
 - Longitudinal Study on Ageing, 21, 32
- Entitlement crisis, 413, 416
- Epidemiologic transition, 135, 237, 248, 578
- Epidemiology, 257
- Equal
 - Employment Opportunity Commission (EEOC), 464
 - treatment directive, 464
- Equity, 198, 209, 212, 223
- ERISA, 505, 506
- Espenshade, 398, 399
- Estonia, 400
- Estudio de Longevidad y Envejecimiento Saludable (CRELES), 236
- Ethnic cleansing, 402
- Ethnicity, 398
- Europe, 8, 40, 41, 43, 45, 48, 54, 57, 61, 62, 137, 365, 367, 383, 400–403, 658
- European Union, 400, 401
- Exclusion, 357
- Expansion of morbidity, 257
- Expatriate lives, 358
- Extended family, 94, 163
- F**
- Familial support
 - ratio, 136
 - Systems, 138
- Familial transfers, 145
- Family, 63, 657
 - care, 649
 - diversity, 653, 661
 - fertility surveys, and, 675
 - joining, 355
 - migrations, 354
 - reunification, 374
 - sponsorship, 372
 - structural transformation, 140
 - structure, 164, 397, 653
 - support, 48, 259, 654
 - values, 140, 357
- Fecundability, 677
- Federation of Government Employees Union (FGEU), 187
- Female labor force participation, 16
 - rate, 137
- Female-to-male ratio, 347
- Fertility, 1, 17, 92, 191–199, 201–203, 222, 254, 256, 355, 395
 - decline, 40, 133, 158
 - impairments, 676
 - levels, 398
 - mortality declines and, 157
 - rate, 397
 - reduction campaign, 178
 - schedules, 396
 - transition, 133
 - treatments, 676
- Filial
 - obligation, 102, 258
 - piety, 161, 170
 - responsibility, 360
- Financial
 - support, 102
 - well-being, 695
 - family income, and, 701

- remarriage, and, 696
- marital loss, and, 701
- Financing, 632
- Finland, 62
- First Demographic Dividend, 145
- First World War, 674
- Fiscal impacts, 402
- Flexible work options, 459
- Floating population, 159
- Former parents, 676
- Formula, 10
- Fourth Age, 39, 45
- Fragmentation, 619
- Frailty, 106
- France, 42, 45, 62, 374, 400, 401
- Freedman, V.A., 548
- Fries, J.F., 554
- Full-time work, 451
- Functional
 - disability, 264
 - impairment, 569
 - impairments and disability, 306
 - activities and instrumental activities of daily living (ADL and IADL), 306
 - gender role, 306
 - physical tasks, 306
 - limitation, 568, 569
 - status, 257, 264
- Fundamental Cause, 589, 591
 - theory, 584
- Funded defined contribution (FDC), 422
- Future
 - health care expenditures, 631, 634
 - trends, 676
- G**
- Gambia, 253
- GDP, 136
- Gender, 106, 107, 277, 282–284, 288–290, 292–295, 297, 298, 306, 307, 309, 570, 576, 657
 - aging and, 294
 - differences, 240, 243, 347
 - equity theory, 61
 - gap in life expectancy, 122
 - household structure and, 292, 293
 - living alone and, 292
 - living arrangements and, 292–297
 - old-age pensions and, 284, 287
 - ratio, 262
 - schooling and, 284, 295, 309
 - widowhood and, 289, 290
 - work and, 284, 288
- Generational
 - accounting, 413
 - equity, 413, 416
 - interdependence, 416
- Generations and Gender surveys, 675
- Geographic
 - distribution, 375
 - location, 193, 207, 208
- Geriatrics, 308
 - care of, 308
 - medicine for, 308
- Germany, 45, 48, 51, 341, 374, 376, 400, 401
 - retirement policy, 484, 485
- Ghana, 253
- Gini coefficient, 494, 502, 512, 514
- Global
 - population aging, 55
 - summary, 43
- Globalization, 137, 343, 496
- Golden Weddings, 97
- Government
 - managed Health Insurance Plan, 139
 - spending, 216, 221, 222
- Gradients, 588
- Grandchildren, 98, 102
- Grandparents, 102
- Great Society, 411
- Greece, 57, 61, 376
- Greenspan Commission, 412
- Grief, 717
- Guest workers, 402
- Guinea, 253
- Guinea-Bissau, 253
- H**
- Haiti, 376
- Hayward, M.D., 548
- Health, 16, 59, 264, 386, 388, 494, 501, 502, 506, 516, 517
 - behaviors, 591, 684, 716, 719
 - care, 3, 61, 144, 165, 166, 186, 203–208, 214, 219, 220, 222, 224, 225, 264, 297, 304, 307, 308
 - costs, 639
 - expenditures, 3, 637, 640
 - financing, 611, 622, 628
 - insurance systems and, 169
 - policies, 620
 - programs, 186
 - systems, 169
- costs, 400
- expectancy, 543, 633
- expenditures, 633, 642
- insurance, 245, 371, 379, 387, 409
 - programs, 165
 - system, 166, 169
- older Arabs, of, 297–306
 - cancer, 303
 - cardiovascular diseases, 298
 - cerebrovascular diseases, 299, 307
 - diabetes, 299
 - hypertension, 298, 299
 - mental health, 297, 306
 - musculoskeletal disorders, 304
 - obesity, 299
- outcomes, 624, 625, 628
- resources, 621
- Retirement Study, and, 450
- selection, 683
- services, 264

- shock, 642
 - Social and Informal Care, 77
 - status, 460
 - transition, 257
 - Health-adjusted life expectancy, 578, 579
 - Healthy
 - aging, 59
 - immigrant hypothesis, 389
 - Life Expectancy (HALE), 127, 571, 633, 651
 - migrant proposition, 358
 - Hearing, 306
 - Heterogeneity, 571, 573, 578
 - High sex ratios at birth, 188
 - Higher
 - education, 16
 - productivity, 16
 - High-skilled immigration, 374
 - Hispanic mortality paradox, 388, 389
 - Hispanics, 376
 - Historical
 - censuses, 671
 - context, 679
 - demographic analysis, 178
 - sample of the Netherlands, 677
 - History of population aging, 37
 - HIV/AIDS, 254, 255, 658
 - epidemic, 56
 - Home help, 101, 107
 - services, 104, 683
 - ownership, 334, 379
 - ties to potential destination areas, 334
 - Honduras, 12
 - Hong Kong, 45, 134, 400
 - Hospice, 632, 643
 - care, 641
 - Hospital Cost and Utilization Project, 639
 - Household, 657
 - composition, 652
 - income, 494, 496, 502, 510, 515
 - patterns, 93
 - Human
 - capital, 63, 355
 - Life table Database, 175
 - Mortality Database, 524
 - Hybrid plans, 503, 505, 506
 - Hyper-aging, 43, 48
 - Hypertension, 264
- I**
- Ibadan Study of Ageing, 265
 - Iceland, 134
 - Illegal Immigration Reform and Immigrant Responsibility Act (IIRAIRA), 372
 - Imach, 144
 - Immigrant Incorporation, 380
 - Immigrants, 3, 10
 - Immigration, 191, 193, 196–203, 206, 365, 397
 - Nationality Act (INA), and, 369
 - Reform and Control Act (IRCA), and, 369
 - Impact of
 - fertility level on age structure, 12
 - Later-Life Migration, 326
 - economic and fiscal, 327
 - migrant selectivity and, 326
 - social, 328
 - Impaired vision, 264
 - Impairment, 568
 - Incidence, 576
 - Income, 244, 246, 263
 - support, 342
 - Increased longevity, 16
 - INDEPTH, 270
 - India, 12, 46, 47, 57, 147, 376
 - Indigenous populations, 234, 248
 - Individual
 - Accounts (IA), 414
 - Retirement Accounts (IRAs), 414, 503, 506, 507
 - Individualism, 258
 - Individualization, 678
 - Indonesia, 56, 147
 - Indoor relief, 407
 - Industrial Development and Later-Life Migration, 321
 - Industry, 453
 - Inequalities in health, 264
 - Inequality, 2, 3, 234, 246, 248
 - Inflation, 411
 - Informal care, 633, 636, 637, 639, 641, 655, 658
 - arrangements, 654
 - caregiver, 632, 639
 - caregiving, 3, 647
 - Inland Steel Case of 1949, 410
 - Institutional care, 164, 308
 - geriatric medicine and, 308
 - house-helpers and, 308
 - nursing homes and, 308
 - Institutionalization, 104, 105, 650, 712
 - gender differences in, 706, 715
 - Institutionalized Life Course, 749, 752, 754
 - Instrumental Activities of Daily Living (IADLs), 143, 264, 550, 570, 571, 636
 - Insurance, 278, 284–287, 290, 309
 - Integrated Public Use Micro-Data Samples, 685
 - Interbellum, 678
 - Intergenerational, 209, 223, 224, 357, 413, 416, 510, 517
 - co-residence, 259
 - equity, 138, 145
 - exchanges, 163
 - Family Support, 268
 - public and familial transfers, 133
 - relations, 163
 - support for the elderly, 187
 - transfers, 123, 144
 - International
 - Database, 174
 - migrants, 3, 62, 175, 235, 395
 - Plan of Action, 60
 - retirement migration, 341
 - Social Security agreements, 350
 - Society for Twin Studies, 26
 - Union for the Scientific Study of Population, 678
 - Year of Older Persons, 58
 - Intra-household resource allocation, 270
 - Investments, 500, 501, 503, 515, 517
 - Ireland, 49

- Islamic, 403
 Israel, 54, 386, 387
 Italy, 2, 51, 57, 61, 136, 374, 376, 383, 400, 401
 retirement policy, 484
- J**
 Jagger, C., 550
 Japanese, 2, 7, 8, 9, 42, 45, 49, 51, 54, 57, 133, 400, 401, 632
 economy, 134
 lost decade, the, 137
 population, 134, 135
 retirement policy, 486
 Japanese-Americans, 389
 Job
 mobility, 450
 tenure, 450
 Justice, 498, 499
- K**
 Keely, 398
 Keyfitz, 398
 Keynesian economics, 411
 Kim Il Song, 182
 Kim Jong Il, 182
 Kin
 networks, 99
 support network, 355
 Kinship, 101
 Kofi Annan, 46, 60
 Korea, 372, 376
 Korean, 386, 387
 National Statistical Office, 175
 Korean-Americans, 385
 Kraly, 398
- L**
 Labor
 income, 150
 market, 483, 484
 entry–exit ratio, 49–51
 migrant, 347
 skills shortages, 462
 Labor force, 133, 400, 402
 participation, 209, 213–215, 220, 378
 among women, 478
 definition, 473
 part-time employment, 479
 rates, 137, 445, 476, 477, 481, 482
 projections, 457
 trends, 447
 Laditka, J.N., 543
 Laditka, S.B., 543
 Laslett, 38, 39
 LAT, 93
 Later-life
 activity, 17
 consequences, 680
 Migration and Labor Force Migration, 323
 Latin America, 45, 57, 231, 365, 367, 369, 383
 Caribbean, and the, 231
 retirement policy, 486
- Latvia, 400
 Less developed regions, 42, 43, 46, 47, 55, 56
 Liberia, 253
 Life
 Course Model, 325
 amenity moves, 325
 assistance seeking, 325
 institutional, 325
 course strategy, 678
 cycle, 16
 expectancy, 1, 4, 40, 41, 116, 134, 174, 181, 194–196, 199,
 200, 203, 206, 211, 224, 248, 279, 307, 521–523,
 526–531, 535, 538, 539, 572, 587, 624, 625, 638,
 650, 705, 706, 731–735, 737–744
 active, 543
 African-Americans, of, 547, 548
 American Indians, of, 548
 at age, 60, 307, 706, 708
 at birth, 279, 307, 706, 707
 defined, 713
 disability-free, 543
 gender differences in, 706, 715
 healthy, 307, 543
 Hispanic, 548
 trends in, 279
 span, 493, 522, 526, 530
 table, 72, 572
 methods, 575
 Life course, 342, 493, 494, 499, 500, 517, 592
 perspective, 584, 592
 Lifecycle
 deficits, 149
 model, 636
 reallocations, 149
 Lifespan, 731, 734, 737, 741
 Life-stage transition, 342
 Lifestyle, 240, 243, 249, 250, 354
 factors, 128
 transitions, 240
 sedentary, 242
 Lifetime employment, 137
 Limitation, 569, 571
 Limited access data, 30
 Linear assumption, 572
 Linguistically isolated households, 382
 Living Apart Together, 93, 709
 Living arrangements, 74, 96, 126, 162, 266, 269, 290–297,
 382–384, 710, *see also* gender and living
 arrangements
 living alone, 710
 skip generation, 712
 Longevity, 3, 17, 642, 683, 731, 732, 734–736, 738, 743, 744
 men, 693
 Longitudinal, 20, 498
 Study of Aging, 640
 Long-term care, 203, 216, 219, 220, 633, 634, 638, 639
 expenditures, 638, 639
 insurance, 632
 Insurance Scheme, 142
 Long-term Influences on Population Aging, 10
 Low fertility, 1
 Lower fertility, 401

- Luxembourg, 400
Income Study (LIS), 23
- M**
- Macroeconomic policies, 137
- Madrid International Plan of Action on Ageing, 259
- Mainichi Newspaper, 142
- Maintain Benefits Equity Investment (MBEI), 414
- Malaysia, 147
- Male/female mortality differentials, 122
- Mali, 253
- Mandatory retirement, 463
age, 137
- Manton, K.G., 554
- Marital
- childlessness, 674
 - history, 685, 698
 - impact on health
 - of men, 697
 - of women, 702
 - stability, 696
 - five-year, 696
 - status, 74, 92, 93, 261, 384, 495, 498, 512, 674, 708, 709
 - gender differences in, 706, 715
 - rates, 705, 706, 709, 710
 - transition, 698
 - age at, 698
 - occurrence of, 698
 - type of, 698
 - violence, 698
- Market economies, 495
- Markov model, 546
- Marriage, 92, 96, 97, 288–290, 691, 715, 716, *see also* gender
and widowhood
- childbearing and, 649
 - institution, 691
 - childrearing union, 691
 - co-residence, 691
 - joint production, 691
 - permanence, 691
 - sexual union, 691
 - longevity, 693
 - men, 693
 - migration, 189
 - protection
 - emotional, 698
 - financial, 698
 - physical, 698
 - support function, 691
- Matlab health and socioeconomic survey, 30
- Mauritania, 253
- Mauritius, 396, 397
- Max Planck Institute for Demographic Research, 28
- Maxwell scandal, 423
- Mean age, 8
- Meaning, 747–754
- Means-test, 411, 414, 418
- Measures advantages and disadvantages, 8
- Measuring Population Aging, 7
- Media, 223
- Median
- age, 8, 113, 191, 194, 197, 201, 202, 496
 - household income, 496, 510
- Medicaid, 410, 631, 634, 639, 641
- Medical model, 568, 569
- Medicare, 410, 611–615, 617, 619, 621, 624, 631, 633, 634, 637, 638, 640, 641, 643
- beneficiaries, 631
 - Current Beneficiary Survey, 635
 - medicine, 308
- Medigap insurance, 634
- Melanesia, 58
- men, 693
- Men's Roles, 656
- Mental health, 385, 386
- Mexican, 384
- Health and Aging Study (MHAS), 236, 239, 244, 246, 247
- Mexican-Americans, 384
- Mexico, 57, 134, 231, 236, 358, 369, 376, 378, 384, 389, 390
- Michigan Center on the Demography of Aging Data Enclave (MICDA), 30
- Microlevel Impacts – Implications for Health and Well-Being, 334
- Micro-level, 261
- Micronesia, 58
- Microsimulation, 546
- Middle East, 9
- Migrants, 247
- Migration, 15, 342
- Decision Model, The, 323
 - search space, 324
 - triggering mechanisms, 324
 - vacation experience, 324
 - Flows, 328
 - key sending and receiving states, 329
 - sub-state origins and destinations, 329
- Millennium Development Goals, 260
- Mobility, 99, 100
- Modal age, 8
- Model life table, 175
- Modernization, 713
- Modernization and ageing theory, 258
- Monopsonistic/oligopsonistic, 619, 620
- Monte Carlo error, 546
- Morbidity, 256, 257, 521, 522, 525, 527, 533, 585, 587, 588
- More developed regions, 42, 43, 46, 48, 49, 55, 56
- Mortality, 3, 10, 41, 191–202, 205, 254, 256, 257, 395, 521–539, 585, 696, 705, 719, 731, 733–744
- changes, 12
 - crossover, 523, 538
 - decline, 10, 39, 40
 - gender differences, 706, 715
 - paradox, 387
 - rates, 574, 578, 631, 632
 - transition, 134
- Mris, 632
- Multigenerational households, 140
- Multinational monitoring of trends and determinants in cardiovascular disease (MONICA), 32

- Multi-pillar programs, 421
 Multiple role, 653, 683
 Multistate life table, 545, 571, 572, 574–576
- N**
 Nagi, 568, 569
 Nagi's Model, 568
 Nathan Keyfitz, 396
 National
 Archive of Computerized Data on Aging (NACDA), 28, 29
 Center for Health Statistics, 524
 Commission on Population Growth and the American Future, 397
 Health Insurance Plan, 139
 Health Interview Survey-Longitudinal Mortality Follow-up (NHIS-LMF), 525
 identity, 398
 Income and Product Accounts (NIPA), 150
 Long-Term Care Survey, 633
 Pension Savings Scheme (NPSS), 424
 Scheme (NPS), 138, 187
 Research Council and Institute of Medicine, 462
 Social Life, Health and Aging Project (NSHAP), 32
 Study of Employers, 451
 Survey of Family Income and Expenditure (NSFIE), 145
 Transfer Account (NTA), 133
 Trends, 43
 War Labor Board, 410
 Natural increase, 398
 Naturalized citizens, 371
 Near poverty, 505
 Net
 immigration, 398
 reproduction rate, 397
 Netherlands, 45
 Never married, 671
 New
 Deal, 407
 Zealand, 8, 45, 49, 54, 374
 Niger, 253
 Nigeria, 253
 retirement policy, 484
 Nihon University
 Japan Longitudinal Study of Aging (NUJLSOA), 143
 Population Research Institute (NUPRI), 136
 No
 in- or out-migration, 10
 fault divorce, 694, *see also* unilateral
 Nordic countries, 2
 Normal retirement age, 447
 Northern America, 58
 Norway, 136
 Notional Defined Contribution (NDC), 421
 Numerical
 growth, 46
 increases, 38
 NUPRI model, 144
 Nuptiality, 92
 Nursing home, 639
 care, 632, 637
- Nutrition, 242
 transition, 242
- O**
 OASDI (Old-Age, Survivors and Disability Insurance), 411
 Obesity, 234, 240, 242, 249, 632
 Occupation, 454, 494, 501, 508, 512
 Occupational
 Information Network (OINET), 462
 status, 263
 Oceania, 58
 OECD, 134, 514, 516
 countries, 607–609, 611, 618, 619, 625, 627, 629
 Offshoring, 463
 Ohio school, 408
 Oil crisis, 134
 Old-age, 15, 39, 122, 161, 173–176, 185, 400, 631
 dependency ratio, 16
 insurance, 408
 pension, 239, 246
 security system, 167
 social security system, 169
 support, 157
 Olshansky, S.J., 558
 One child policy, 57, 157, 159
 Outdoor relief, 407
 Outliving one's children, 676
 Out-of-pocket health care expenditures, 636
 Ownership society, 413
- P**
 Pakistan, 7, 8, 56
 Panel Study of Income Dynamics, The, 568
 Parent
 support ratios (PSRs), 124, 185
 child attitudinal differences, 357
 Parenthood, 681
 Pareto efficiency, 499
 Partial privatization of Social Security, 415
 Part-time work, 451
 Pathology, 568
 Patient Self-Determination Act, The, 724
 Paul Erhlich, 397
 Pay-as-you-go
 (PAYGO) principle, 124
 defined benefit (PAYGO DB), 409, 421
 financing, 138
 pension system, 9
 PBGC, 506
 Pension, 3, 60, 108, 109, 186, 209, 210, 212–214, 263, 400,
 402, 480, 483, 484, 494, 500, 501, 503–508, 512,
 514, 515
 benefits, 137
 plans, 449
 programs, 145, 408
 reforms, 139, 167
 scheme, 167
 system, 124, 167, 168
 Per capita expenditures, 632
 Permanent residents, 369, 373

- Permanently
 - childless, 685
 - single, 676
- Person years, 572, 573
- Personal
 - Care, 660
 - development, 360
 - Security Accounts (PSA), 414
- Phased Retirement, 451
- Philippines, 134, 376
- Physical health, 696
 - divorce and, 694
 - early marriage and, 700
 - marital conflict and, 693
 - duration of, 700
 - quality of, 693
- Physically demanding jobs, 462
- Place Identity Model, The, 326
- Policy, 192, 201, 203, 209, 211, 213–216, 218, 223, 260, 395–399, 401–403, 558
 - Principles, 58
- Political Declaration of the Second World Assembly on Ageing, The, 58
- Polynesia, 58
- Poor
 - houses, 407
 - laws, 407
- Population, 133
 - aging, 1, 2, 4, 133, 402, 496, 607–610, 613, 615–618, 621, 623, 628, 648
 - Canada, 191, 192, 194, 197–225
 - United States, 192, 194–196, 202–204, 207–209, 213, 221, 225
 - Bomb, The, 397
 - change, 191, 192, 194, 196–204, 207–209, 211, 216–219, 225
 - connection, 397
 - control, 396
 - decline, 401, 402
 - explosion, 46
 - growth, 192, 193, 197, 198, 201, 210, 211, 217, 218, 220, 225, 395–398, 402
 - policies, 59
 - projections, 1, 135, 201, 202, 210, 212, 217
 - pyramid, 7, 179, 183
 - size, 395
- Portugal, 374, 376
- Positive
 - ageing, 360
 - approaches to old age, 354
- Postponement of parenthood, 677
- Potential Support Ratio (PSR), 123, 185, 186, 400, 401
- Poverty, 145, 263, 372, 379, 499, 502, 504, 505, 512, 516
- Predicting mobility: insights gained from panel studies, 332
 - disability, 333
 - migration decision-making, 332
 - mobility intentions, 334
 - motivations, 333
 - person-ties at origin, 334
 - social resources, 333
 - wealth, 334
- Preference theory, 61
- Prescription drugs, 634
- Preston, 10
- Prevalence, 573, 576, 579
 - based life tables, 545
- Primary caregivers, 655
 - Insurance Amount (PIA), 417
- Private health expenditures, 611
 - pensions, 429, 431, 440, 441
 - sector, 610, 611, 618, 619, 621
 - transfers, 145
- Producing population, 184
- Productivity, 59
- PROGRESSA, 596
- Progressive tax, 500
- Projection
 - methods, 398
 - period, 175
- Projections, 1, 369, 395, 401
- Pronatalist, 178
 - 1950s, 679
 - policies, 62
- Property prices, 350
- Provident fund model, 422
- Proximate Risk Factors, 589, 591
- Proximity, 75, 100
 - Contact, and, 652
- Psychological well-being, 684
 - gender differences in, 706
- Psychosocial
 - factors, 589
 - risk factors, 590
- PTCA, 639, 640
- Public
 - insurance, 634
 - sector, 610, 611, 613–615, 618–622
 - services, 101, 103
- Q**
- Quality
 - Adjusted Life Years (QALYs), 633
 - of life (QOL), 59, 60, 270, 354
- R**
- Race and ethnicity, 197, 204, 206, 209, 375, 576
- Racial/ethnic minorities, 336
 - patterns of older adult mortality, 534, 539
- Rapid population growth, 396, 397
- Rates of
 - childlessness, 672
 - Later-Life Mobility, 319
 - historical and cross-national studies, 321
 - retirement peak, 322
 - United States, in the, 319
- Rationed, 105
- Rationing, 109
- Real health resources, 622
- Reconciling Professional Work and Care Responsibilities, 83

- Record Linkages, 31
 - biomarkers, 31
 - ecological data, 31
 - Red herring, 638
 - Redistribution, 499, 500, 505, 516
 - Refugees, 369, 386, 403
 - Regional Trends, 42
 - Rejuvenation, 53
 - Relationships, 192, 208, 224
 - Relative age, 16
 - Remarriage, 698
 - advantages of, 698
 - in young adulthood, 696
 - duration, 698
 - Remittances, 235, 247
 - Repeated cross-sectional, 20
 - Replacement, 397, 398
 - fertility, 399
 - level fertility, 41, 62
 - migration, 396, 402, 403
 - Reproductive history, 683
 - Republic of Korea, 147, 400, 401
 - Reserve financing, 138
 - Residential
 - care, 683
 - mobility, 343
 - Retirees, 500, 504–506
 - as a population, 488
 - Retirement, 3, 16, 109, 341, 402, 632
 - age, 401
 - average age, 471, 472
 - contracts, 95
 - current patterns, 475–480
 - definitions of, 471–473
 - demographic interest in, 471
 - explanations of, 473–475
 - historical trends, 480–484
 - history study, 450
 - housing, 344
 - life stage, 487, 488
 - migration, 2
 - pensions, 410
 - settlements, 344
 - Return
 - migration, 354
 - to the workforce, 452
 - Revenue Act of 1978, 415
 - REVES (Réseau Espérance de Vie en Santé), 543
 - Robine, J.M., 548
 - Rural to urban migration, 159, 169, 260
 - Russia, 9, 45, 48, 51
 - Eastern Europe and, 2
 - Russian Federation, 118, 400, 401
- S**
- Salmon effect, 390
 - Salud y Bienestar en el Envejecimiento (SABE), 236
 - Same-sex couples, 724
 - Samples, 714
 - quasi-experimental, 715
 - Sampling error, 546
 - Saving trends, 133
 - Savings, 500, 501, 503
 - Scale in policy implementation, 60
 - Schooling, 280–284, *see also* gender and schooling
 - Seasonal migration, 331
 - resident, 344
 - Second demographic
 - dividend, 145, 170
 - transition, 41, 53, 54, 56, 61, 64, 750
 - UN World Assembly on Ageing, 259
 - Second World
 - Assembly on Ageing, 60
 - War, 674
 - Secularism, 258
 - Selection effects, 683
 - Selective
 - immigration, 389
 - mortality, 577
 - Self
 - assessed health, 128
 - care, 658
 - employment, 453
 - evaluated health, 358
 - rated health, 264
 - Senegal, 253
 - Senescence, 734, 739, 741–743
 - Senile dementia, 141
 - Seniority-oriented wage system, 137
 - Seoul, Pusan and Daegu, 173, 175
 - SERPS (State Earnings-Related Pension Scheme), 423
 - SES, 501, 502
 - differences, 656
 - Severance pay, 137
 - Sex Differences in Life Expectancy, 530
 - ratio, 45, 46, 72, 182, 193, 194, 198, 199, 204, 205, 347, 706
 - selection, 396
 - Short-run influences on population aging, 10
 - Siblings, 98
 - Sierra Leone, 253
 - Simulations, 395
 - Singapore, 147
 - Single, 92
 - mothers, 697
 - Single person households, 267
 - Skipped generation households, 267
 - Smoking, 240, 242, 249, 300
 - prevalence, 300, 301
 - rates, 632
 - water-pipe, 302
 - Social
 - capital, 63
 - causation, 683
 - changes, 651
 - inequality, 750
 - insurance, 411, 496, 499–501, 503, 504, 516
 - integration, 59, 398, 681
 - security, 3, 238, 239, 245, 246, 249, 370, 371, 374, 379, 380, 384, 390, 407, 494, 502–508, 512, 514, 596, 597, 611–615, 617, 619, 620

- Act, 407
 - agreement, 349
 - beneficiaries, 374
 - client statistics, 345
 - earnings test, 449
 - health care systems, and, 170
 - insurance, 168
 - Old-Age Survivors and Disability Insurance Programs (OASDI), 417
 - programs, 3
 - reforms, 235
 - system, 133, 260
 - Social services, 682
 - provision, 260
 - status, 656
 - structure, 474, 475, 747, 749, 752
 - welfare benefits, 494
 - Socioeconomic
 - Differences in Health, 585
 - group, 360
 - position, 266
 - status, 204, 207, 576, 577, 584, 656
 - Solidarity, 357
 - Son preference, 183
 - South Africa, 56
 - South Korea, 45, 401
 - North Korea and, 2, 173
 - Southern Europe, 2, 42, 45, 57
 - Soviet, 403
 - Jews, 386
 - Union, 369, 401
 - Spain, 57, 358
 - Speed of aging, 42
 - SRB, 174, 175, 188
 - Stable age pyramids, 11
 - structure, 10, 11
 - populations, 10
 - theory, 395, 398
 - Start of old age, 38
 - State expectancies, 575
 - State of being model, 695
 - stress and the, 692
 - State Pensions, 345
 - States, 62
 - Stationary population, 398, 399
 - Status, 204–209
 - attainment, 500
 - divergence, 501
 - leveling, 499, 501
 - maintenance, 499, 500
 - Sterilization, 397
 - Sterling-Lehlbach Act, 408
 - Stigmatized, 680
 - Stockholm initiative, 467
 - Stocks of capital, 16
 - Structural
 - adjustment programs, 255
 - lag, 747
 - Structuring influence of parenthood, 680
 - Study of
 - social and psychological factors affecting fertility, 678
 - Global Ageing and Adult Health (WHO SAGE), 270
 - Subpopulations, 573
 - Sub-Saharan Africa, 9, 15
 - Sub-Saharan African, 658
 - Successful aging, 224
 - Succession, 473
 - Sullivan's method, 545, 571–575, 579
 - Supplemental Security Income (SSI), 370, 418, 596–598
 - Support
 - family, 235
 - institutional, 235, 245
 - patterns, 106
 - ratio, 257, 631, 639
 - social, 240
 - Survey of Health,
 - Ageing and Retirement in Europe (SHARE), 23
 - and Well-Being of Elders (SABE), 713
 - Well-Being and Aging in Latin America and the Caribbean, 23
 - Survival, 650
 - Survivor benefits, 409
 - Sweden, 12, 42, 136, 379, 383
 - retirement policy, 485
 - Swedish Twin Registry, 26
 - Switzerland, 45, 51
- T**
- Taiwan, 642
 - Tax, 109
 - Taxation, 496, 500
 - Technological change, 632
 - intensification, 615, 616, 618
 - Technology, 615, 616, 628, 660
 - diffusion, 639
 - Temporary visitors, 373
 - Thailand, 42, 147, 359
 - Third Age, 38, 39, 342, 360, 749, 750
 - Three
 - generation household, 94
 - pillars of pension policy,
 - Threshold Effects, 588
 - Time to death, 637, 643
 - Time–space use, 359
 - Togo, 253
 - Total
 - Dependency Ratio (TDR), 15, 183
 - Fertility Rate (TFR), 134, 174–176, 178, 179, 183, 187, 188, 193, 195, 199, 278
 - replacement TFR, 279
 - Totalization agreements, 350
 - Townsend Movement, 408
 - Trade-offs between fertility and mortality, 16
 - Transfers, 102, 244
 - Transition, 49
 - probabilities, 574
 - rates, 576
 - Transnational, 359
 - life style, 359
 - residence, 344
 - Trends in immigration, 368
 - Trust fund, 419, 611, 612, 617

- Turkey, 374
 Turnover of the population, 7
 Twin registries, 26
- U**
- U.S.
 Bureau of the Census, 174
 Immigration and Nationality Act, 367
 Longitudinal Survey of Aging, 683
 National Health and Nutrition Examination Survey (NHANES), 25
 National Surveys of Family Growth, 675
- UN forecasts, 13
 Population Division, 399, 401
- Unauthorized
 immigrants, 370
 migration, 403
- Undocumented
 immigration, 369
 workers, 403
- Unemployment rates, 454
- Unilateral divorce, 694, *see also* no fault
- Unions, 408
- United Kingdom, 42, 45, 341, 374, 376, 400, 401, 634
 retirement policy, 485
- United Nations, 59, 136
 Regions, 54, 55
- United States, 2, 10, 42, 45, 46, 48, 49, 54, 62, 134, 341, 400, 401, 403
 Census Bureau's International Data Base, 20
 University of Chicago's Center on Demography and Economics of Aging, The, 32
- Unmet need, 358
- Urbanization, 179
- V**
- Verbrugge and Jette, 568
 Verbrugge-Jette model, 569
 Very low fertility, 134
 Vienna, 15
 International Plan of Action on Ageing, 253
- Vietnam, 13, 369, 376
 War, 496
- Vision, 306
- Vital registrations, 672
- Voluntary childlessness, 678
- Volunteering, 224
- Vulnerability, 260
- W**
- Wages and salaries, 494, 498
 War on Poverty, 411
 Wealth, 247, 494–496, 498, 501–503, 506, 508, 510, 517
 Welfare, 370–372, 380, 385, 387
 state legacies, 429, 437, 439
 states, 2
- West Africa, 2
- West African countries, 2
- Western Europe, 39, 42, 54
- Westernization, 259
- Widowhood, 4, 499, 695, 705
 depression and, 697
 emotional health and, 697
 physical health and, 696
- Wisconsin school, 408
- Withdrawal from the labor force, 455
- Wolf, D.A., 550
- Women, 706, 709, 715
 educational attainment of, 720
 living arrangements, 709
 physical health of, 718
 status of, 706, 714
- Work, 284–288, *see also* gender and work
 ability to, 460
 expectations, 456
 family and, 653
 related stress, 462
 retirement, in, 451, 457–459
- Working
 age, 401
 pensioners, 453
 retirees, 452
- World
 Bank, 429, 430, 437, 442
 Health Collaborative Study on Social and Health Aspects of Aging, 24
 Health Organization, 569, 578
 Population Conferences, 59
 War I, 408
 War II, 57, 496
- Y**
- Young-old, 39
 Youth dependency ratio (YDR), 15, 183, 184
 Yugoslavia, 374, 386
- Z**
- Zero Population Growth, 395, 397