Social Demography of South Africa

Advances and Emerging Issues

Edited by
Clifford O. Odimegwu
and John Kekovole

ROUTLEDGE

Social Demography of South Africa

This edited collection investigates what progress has been made in the field of social demography in South Africa since the democratic dispensation in the country. Contributors offer a compilation of in-depth analytical studies of substantive, technical, and contemporary issues in the South African demographic landscape. Accessible and topical, it is a useful reference guide to those working in disciplines such as sociology, geography, statistics, and economics and to all those trying to understand the role of national statistical agencies in national development planning in Africa.

This book project is funded by Statistics South Africa, Pretoria, South Africa.

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This book is dedicated to all those who encourage and promote the use of data in national development in Africa.

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Contents

Figures

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Tables

Foreword

Social Demography of South Africa: Advances and Emerging Issues is another major milestone in the history of Statistics South Africa (Stats SA). It is the fourth book to be published as part of the African Census Analysis Project (ACAP), which Statistics South Africa was instrumental in its launching in collaboration with the University of Pennsylvania, United States. The major objective of this project is to enhance the analysis of demographic, socioeconomic, and social cultural data collected in African countries. This book is an upshot of the work the staff have undertaken to enhance their intellectual development by engaging in in-depth studies of the diverse demographic, socioeconomic, and social data that have been collected in censuses, surveys, and administrative records in South Africa. It focuses on social demographic trends in South African since 1994 and provides socioeconomic analysis of these trends.

When I was appointed the Statistician General of South Africa in 2000, one of my immediate challenges was how to position the organisation as a professional/intellectual statistical organization. There was dearth of qualified staff. The general public perception was that the duty of the organisation was to issue basic reports such as statistical releases after huge data collection. I profoundly believed that this had to change as quickly as possible. The organisation embarked on aggressive capacity-building activities, which included sending staff to various academic institutions on the continent and abroad for training as well as strategic recruitment choices that attracted the best in all the relevant fields.

Since 1994, the organisation has conducted three national censuses of population and housing starting in 1996, then 2001, and the most recent is the 2011 census. The organisation also conducted one large Community Survey in 2007, but since 1994 to date, numerous household surveys such as labour force surveys, general household surveys, and the like have been conducted, placing Stats SA as a premiere fact finder of the nation. In order to fully explore the value of these huge datasets in Statistics South Africa, we embarked on this trip of driving a knowledge agenda that taps into these data holdings so that we can achieve a profound understanding of the socioeconomic and demographic landscape of South Africa.

This volume is a product of this effort. Professionals in the organisation are continuously mobilised to carryout in-depth and focused analysis of different issues of interest to them. The mandate was and remains the repositioning of Statistics South Africa as an intellectual platform for generating requisite data and undertaking in-depth analyses of these data to inform decision making at all levels of planning in the country. Apart from emerging issues in this volume, the task is to document the demographic narrative of South Africa. This means that the country is indeed dynamic, and changes are being made in various areas.

This work has highlighted the great utility of civil registration systems, as some of the authors have reported that information obtained from the Vital Registration System (VRS) approximates closely to census information. This gives me the impetus to call on my African colleagues in this business of generation of statistics to invest in their national vital registration systems. As part of this advancement in about five countries on the continent, as Africans, we have committed to the next five years as the years of Civil Registration and Vital Statistics. Perhaps by so doing, we will be able to reduce the number of questions we currently include in population and housing censuses.

Some of the work was done in collaboration with a few colleagues from one of the leading universities in the continent, the University of the Witwatersrand, South Africa. This collaboration is a mark that a government statistical agency can fruitfully engage in intellectual exercise in collaboration with academia. I am using this opportunity to thank Clifford Odimegwu of the Demography and Population Studies Programme of the University of the Witwatersrand, South Africa, and John Kekovole of Statistics South Africa for being the arrowheads of this intellectual engagement. I profoundly appreciate their dogged determination in getting this work to completion.

I am happy to commend this book that brings to you the South Africa I know, the Home I Understand to our universities, research centers, relevant government departments, and national and international nongovernmental organizations for the richness of the information it contains. Let me reiterate my call to other statistical agencies to go beyond basic reports/statistical releases of our datasets to also engage in in-depth, focused analyses of these datasets. I am confident that with the right environment and motivation, we can tell our continent's and individual countries' narratives. The time has come to define ourselves.

Pali J. Lehohla
Statistician-General
South Africa

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The editors of this seminal book by professional staff of Statistics South Africa are highly indebted to the following organisations, individuals, and colleagues for their immense contribution and support for the completion of this work.

1. Statistics South Africa for the vision of African capacity building in census analysis; initiating this work, providing all the logistics for the analysis, and writing workshops. The role of the Statistician-General of Statistics South Africa and his management team cannot be quantified.
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Introduction and Overview

Clifford O. Odimegwu and John Kekovole

Since 1994 when South Africa became a democratic state, Statistics South Africa has been one of the agencies that have been set up by acts of Parliament and charged with the responsibility of generating quality statistics for informed decision making, particularly policy formulation and implementation of various programmes. The organization has hence conducted a number of censuses and surveys. To date, three national population and housing censuses have been conducted, while numerous surveys have been carried out. Such surveys include General Household Surveys, Labor Force Surveys, Community Survey, among others.

At the end of these large and costly exercises of data collection, statistical releases, usually in simple percentages and numbers, are generated and marketed widely. Micro data are then archived and made available to various institutions, public and private, that need detailed information for their use. This limits the organization to only generating data and publishing statistical releases. This, certainly, is not a good way of tapping the professional resources that have been developed through huge investments that have been made since 1994 to capacitate staff.

In order to engage the professional skills of this organization, the senior executive management decided to engage the professional energy of some of the staff to embark on in-depth, detailed analysis of different data sets in the organization's archive. This book, *Social Demography of South Africa: Advances and Emerging Issues*, is a product of this exercise. It is a continuation of the work that was initiated by the African Census Analysis Project (ACAP), which is a collaborative initiative between researchers at the University of Pennsylvania and African institutions to develop the skills of African scholars in demographic data collection, research, and training. The initiative aims to preserve and maximize the use of data collected in African censuses and surveys for academic and policy research.

The book documents interesting and emerging issues in the social demography of South Africa. It highlights, more importantly, some useful findings—one of which is the value of a good civic registration system. Two chapters in this book demonstrate that vital registration data, as much as census data, can be used to generate good demographic parameters.

OVERVIEW

The book starts with the documentation of sources of socioeconomic and demographic data that have been used by authors in their analyses. Odimegwu and Kekovole provide the background information on the sources of data used. They give a picture of the role of Statistics South Africa in statistical data generation, processing, and utilization in South Africa. The main data include censuses of 1996 and 2001, Community Survey 2007, General Household Surveys, Labour Force Surveys, and their variants.

In Chapter 2, Nhlapo and Doctor assess the nature of age-structural transitions and their implications on socioeconomic development in South Africa. Making using of population projection techniques and assessment of demographic trends until 2020, they demonstrate that South Africa will experience its first age-structural shift from a "childhood" phase to a "youth" phase by 2015. They argue that South Africa's structural transition is likely to be smoother than observed in a number of East Asian countries.

In Chapter 3, Christine Khoza assesses the potential for usability of death registration data for mortality estimation in South Africa. Using different assessment frameworks that draw from other related researches, she has noted that completeness increased from 87% in the 1996 to 2001 periods to 93% in the 2001 to 2006 periods, confirming significant improvement in the registration of deaths in recent years. Comparability of adjusted mortality rates with other data is evident. Also, cause-specific mortality at grouped disease level is found to be consistent with epidemiological expectations.

In Chapter 4, Mosidi Nhlapo, using birth data from the South African Department of Home Affairs from 1998 to 2008, assesses the quality and reliability of birth registration data by comparing fertility schedules derived from these data and those obtained from enumerated data. She has found that fertility schedules derived from completeness-adjusted data compare favourably well with enumerated data, although some level of variation exits between sources. Total fertility rates (TFR) derived from the civil register give estimates of 3 in 2001 and 2.6 in 2006. The 2006 unadjusted data provide a TFR of 2.5, which is reasonably closer to the estimate derived from the Community Survey (2007) of 2.6 unadjusted and 2.8 adjusted. The cumulative fertility schedule gives evidence of a decline of around 0.5 children per woman between 2001 and 2006. However, she has noted that the absence of some key variables such as race, education, and marital status limits the use of this data in determining fertility differentials, which are very important in the South African case. Also, the method used to extract the birth data published by Stats SA limits diagnoses of the causes of observed defects and casts doubt on the validity of some aspects of the data.

Joyce Lestrade-Jefferis in Chapter 5 focuses on the employment situation of the country at subprovincial levels and how this has changed since 1996. She highlights the analytical difficulties encountered when comparing the

levels and trends of employment and related indicators such as the labour absorption rate and formal-sector labour absorption rate obtained from the population censuses (1996 and 2001) and the Community Survey (2007) with the "official" household-based employment series produced by Statistics South Africa. While noting that underreporting of informal-sector employment in Census 2001 poses a constraint, provincial trends in the labour absorption rate (1996 and 2007) and the related formal-sector labour absorption rate (2001 and 2007) based on the census/Community Survey (CS) series are generally plausible. She concludes by noting that at subprovincial level, these rates are a reasonably accurate reflection of developments in the South African labour market; however, further research is required to confirm these findings.

In Chapter 6, Maletela Tuoane-Nkhasi and Abram Moyo use multiple-cause-of-death data to provide trends and patterns of reporting multiple and underlying causes of death in South Africa from 1997 to 2007. About one in four death notification forms had multiple causes of death, with an average of 1.6 causes of death per death notification form. Reporting of multiple causes of death was associated with sociodemographic and regional characteristics of the deceased and characteristics of the certifier as well as conditions reported on the form.

Although multiple-cause-of-death data have limitations, the authors have noted their considerable value in providing information that is crucial for formulating health plans and policies to prevent premature mortality and improve the quality of life. They conclude by requesting that future analyses of data on causes of death in South Africa should start to shift emphasis from reporting only on the underlying causes of death to statistics on multiple causes to complement the underlying causes-of-death information.

Samuel Kojo Antobam in Chapter 7 investigates the impact of rural–urban migration on household savings and business investment practices using data from the Statistics South Africa Labor Force Survey of 2003. He has identified three types of migration-remittance statuses and their corresponding impacts on savings and business investment of households.

Controlling for both observed and unobserved characteristics using propensity score matching and instrumental variable techniques, he has found that migration without remittance consistently has more significant positive impact on saving and business investment behaviour of the household than migration with remittance and remittance without migration, which have positive impact only on business investment and savings, respectively. He stresses the fact that the positive impacts of migration-remittance status on savings and investment become more prominent when rural households have some other sources of income.

In Chapter 8, Ubomba-Jaswa and colleagues highlight the need for demographers to go beyond migration and explore the relevance of temporary population movements in the discourse on the population and

development. Using border statistics from 1980 to 2009 collected by South Africa immigration officials at all the ports of entry, they have noted that the months of June and December were the lowest and the highest visitor arrival months, respectively. Visitors from Europe and the SADC countries were prominent, whilst those from other African subregions were invisible. Holiday remained the main purpose of visits, but increases in students and businesspersons were observed. A shift from overseas visitors as the dominant group to visitors from Africa is evident. The use of road transport was more prominent in the postapartheid era compared to air travel. The characteristics of the temporary population movements during the two periods were influenced mainly by tourism, transport, and communication infrastructures, politics and immigration regulations that operated in both eras. There is the need for South Africa to reach out to other African countries and also diversify data collection methods and contents of border statistics.

In Chapter 9, Tapiwa Jhamba and Malefo Mmatli examine trends and variations in household characteristics, types, and family composition in South Africa using micro data from the 1996 and 2001 censuses and the 2007 Community Survey. The results show that the proportion of households headed by females and the elderly remained largely unchanged from 1996 to 2007. They have also highlighted the importance of sociocultural factors in determining household composition and family living arrangements and have recommended that further research, including qualitative studies, needs to be carried out to provide further insights into a better understanding of the role played by these factors, socioeconomic and cultural context, and in the changing demography of households and families in South Africa.

In Chapter 10, Gilimani and colleagues explore whether the socioeconomic factors of location, population group, sex, household head's level of education, and the death of a biological parent influence the educational outcomes of youth aged 15 to 34 years not attending educational institutions at the time of data collection. The results indicate that during the study period, the percentage of male and female youth with no education decreased significantly and that females were more likely to achieve a tertiary education compared to males. Indians/Asians and Whites were more likely than Africans to obtain Grade 12 or tertiary education. The results also suggest that the chances of the youth achieving higher levels of education increased with increased levels of education of the household head as well as when one or both parents were still alive.

In Chapter 11, Odimegwu and colleagues examine levels, trends, patterns, and determinants of labour force participation since the advent of democracy in South Africa. They have noted that while more young people are taking part in the labour force, a higher proportion of the older population also seems to be retiring late. The activity rate of people with low levels of education plummeted over the period and that of people with higher levels of education became increasingly sought after. The proportion

of women in agriculture/fishery industry increased, while men's proportion in the sector declined drastically. The economy is expected to undergo continuous transformation in response to the ongoing structural changes in the country's labour force. The effect of HIV/AIDS epidemic on the labour force is highlighted.

Mabela and Fanoe in Chapter 12 evaluate the trends and levels of the participation and actual employment of women in the South African labour market. They also investigate the likely predictors that influence the extent to which women will participate and become employed in the labour market. Their findings indicate that women's participation in the South African labour market has remained consistent among the different racial groups over the period studied (2006–2010). However, participation did not automatically result in employment. The patterns of participation among the racial groups were also not duplicated when actual employment was studied. The potential contribution of females in the South African labour market is still underutilised despite a new political dispensation for the last sixteen years.

In Chapter 13, Simelane and Masiteng have used data collected in the 1996 and 2001 population censuses and the 2007 Community Survey to provide insights into (1) the trend in poverty levels in South Africa between 1996 and 2007, (2) spatial distribution of the poor, and (3) the characteristics of the poor. They have used the principal components analysis to create an index of assets and capabilities poverty (ACP) with the poverty line set at half the median index score. They have also used spatial statistical analysis and logistic regression techniques to understand the spatial dimension of poverty and the characteristics of the poor in the country. Assets and capabilities poverty is high in South Africa but appears to have decreased considerably between 1996 and 2007. Blacks and Coloureds face the highest poverty levels. Likewise, Eastern Cape and Limpopo are the most impoverished provinces. One of the major conclusions drawn from the study is that South Africa is gradually being polarized by poverty status, and this is undesirable from the policy point of view.

In Chapter 14, De Wet and Ahuejere examine the demography of disability in the country. The results show that the African/Black population and females are most affected by disability. Persons with disability also have secondary education, but this percentage seems to have decreased over time. In addition, hardly any persons with disability have tertiary education. The regression analysis shows the odds of disability occurring to the Coloured population has increased over time. Furthermore, the odds of females developing disabilities in South Africa have also increased. Finally, the results from the regression analysis indicate that as education level of individuals increases, the odds of disability occurring decrease.

Finally, Masiteng and Lubaale examine the gender disparities in South Africa using data collected in the 2007 Community Survey and the 1996 and 2001 population censuses. The results show that education is the most

important factor as far as the bridging of the gaps between men and women in terms of employment, income, availability of household amenities, and property ownership are concerned. It appears South Africa is on track to achieve the Millennium Development Goal in regard to gender disparity. It is recommended that the government continue and strengthen areas in which the gender gap has narrowed, including where males are disadvantaged.

1 Sources of Socioeconomic and Demographic Data in South Africa

Clifford O. Odimegwu and John Kekovole

Statistics South Africa is a government department charged with the responsibility of generating economic, social, and demographic statistics for planning and development. Its activities are regulated by the Statistics Act (Act No. 6 of 1999). According to the act, the purpose of official statistics is to assist organs of state, business, other organisations, and the public in planning, decisionmaking, and monitoring and assessing government policies and programmes. The mandates of the organisation include promoting coordination among statistical producers in South Africa to improve the quality, consistency, comparability, and optimum use of official statistics, avoiding unnecessary duplication, providing statistical advice to organs of state, and liaising with statistical agencies of other countries and international agencies. The effective and efficient administration and management of the organisation is in the hands of a Statistician-General. The act also provides for a Statistics Council, whose mandate is to advise the Statistician-General and the minister responsible for statistics (Statistics South Africa, 2009).

The economic statistics produced by the organisation include price levels and changes, size of the economy, production, consumption, and labour market dynamics. These statistics facilitate the estimation of various indicators such as Producer Price Index, Consumer Price Index, and the gross domestic product (GDP) and also statistics on industries such as construction, manufacturing, mining, and tourism.

Since the democratic dispensation in 1994, Statistics South Africa has conducted a number of censuses and surveys which have facilitated decision making at all levels of policy formulation and planning, as discussed in what follows.

South Africa has conducted three population and housing censuses in the postapartheid era (1996, 2001, and 2011) as per the United Nations recommendations (UN 2008). The data collected in the first two censuses have been used by some authors in their respective chapters. The data collected in the 2011 census were not ready at the time of preparing this book. The 1996 census recorded a population size of 40,6 million, and the 2001 census recorded a population size of 44,9 million (Statistics SA 2003). Both

censuses collected information on demographics (age, sex, migration, fertility, and mortality), disability, income, education, employment, housing, and services.

Another important source of demographic information in South Africa is the civil registration and vital statistics systems. Civil registration is defined by UN (2002) and UNECA (2009) as the continuous, permanent, compulsory, and universal recording of the occurrence and characteristics of vital events pertaining to the population as provided through decrees or regulation in accordance with the legal requirements of each country. The vital events are live births, deaths, foetal deaths, marriages, divorces, annulment of marriages, judicial separation of marriages, adoptions, legitimizations, and recognitions.

According to the UN, civil registration has dual purposes. One is the administrative and legal purpose, which relates to the establishment of legal relationships between government and its citizens. It establishes the relationship between an individual and the government of a country. It is also the conventional instruments that are used to ensure proper implementation of various human rights provisions enshrined in a country's laws and international instruments (UN 2002). The second purpose is that it is used by demographers to get precise and up-to-date measurements of demographic changes (fertility, mortality, and migration) and facilitatesthe study and analysis of trends used in designing, implementing, monitoring, and evaluating policies and programmes (UNECA 2009).

South Africa has a history of civil registration which has transformed significantly over time. While the Department of Home Affairs (DHA) is responsible for the registration of seven vital events—namely births, deaths, stillbirths, marriages, adoptions, legitimizations, and recognitions—the Department of Justice and Constitutional Development is in charge of two vital events, namely divorces and annulment of marriages. Statistics South Africa is mandated to produce vital statistics based on data from these civil registration systems (DHA 2012), and this function is regulated by the Statistics Act (Act No.6 of 1999). Currently Statistics SA provides information on four vital events from the civil registration systems (live births, deaths, marriages, and divorces). The information is made available and accessible to users in the form of statistical releases (DHA 2012).

There are other sources of socioeconomic and demographic data conducted by the organisation. One of these is the Labour Force Survey (LFS). In 2000, Statistics South Africa conducted its first LFS and continued to do so in March and September each year (Stats SA 2008a: 1). The LFS sample was nationally representative and used the South African Census of 2001 as the sampling frame (Stats SA 2008a: 1). The unit of observation used was the household, but since households are mobile and difficult to track, the unit of sampling selected was the dwelling unit (Stats SA 2008a: 1). Dwelling units selected were intended to remain part of the sample for five survey

rounds successively with a fraction of these, one fifth, being rotated out (Stats SA 2008a: 1).

In 2005, following a written report of the limitations of the LFS by the International Monetary Fund (IMF), Statistics South Africa decided to change the cycle of the LFS to quarterly data collection (Stats SA 2008a: 1). There was need for continuous data collection and an automated data processing system in order to increase the frequency of the survey and release of the results (Stats SA 2008a: 1). Thus new fieldwork procedures, a shorter core questionnaire, and a new Master Sample for the sampling frame were developed (Stats SA 2008a: 1).

The Quarterly Labour Force Survey (QLFS) covers non-institutional population except for workers' hostels (Stats SA 2008b: 2). The sample of the QLFS is also based on a master sample that was developed using data obtained from the 2001 census (Stats SA 2008b: 2). The sample is representative at provincial level and metro/non-metro level within provinces and also by the four geographical types (urban formal, urban informal, farms, and tribal). The QLFS covers approximately 30,000 dwellings per quarter (Stats SA 2008b: 2). The survey "frame has been developed as a general purpose household survey frame that can be used by all other household surveys irrespective of the sample size requirements of the survey" (Stats SA: 2010, 15). Since the estimates collected are based on a sample, the results are subject to sampling and nonsampling errors (Stats SA 2008b: 3). The nonsampling errors include tabulation and accurate reporting, among others (Stats SA 2008b: 3). These errors are minimised through nonresponse adjustment, data collection procedure revision, and quality control (Stats SA 2008b: 3).

With regard to data collection, the training and refresher training of fieldworkers is of the utmost importance. There are two components of this pre–data collection task (Stats SA 2008b: 11). The first is to inform current or existing fieldworkers of any new developments regarding the questionnaire, sample, or related issues (Stats SA 2008b: 11). The second component is the training of new fieldworkers (Stats SA 2008b: 11). This element includes field-practice sessions and the dissemination and studying of the survey officers' manual, training guide, quality assurance manual, and other relevant documents (Stats SA 2008b: 11). An important aspect of the fieldwork that is the undertaking of publicity and awareness (Stats SA 2008b: 12). Permission is needed from community leaders and gatekeepers in order for fieldwork to be conducted (Stats SA 2008b: 12). Thus fieldworkers first have to visit various farmers' unions, street committees, and community leaders to request permission to interview and set up interview dates with dwelling units (Stats SA 2008b: 12). The initial visits to dwelling units are done in person; however, the visits for the rest of the year are done telephonically to request permission and participation (Stats SA 2008b: 12).

For the questionnaire design, the QLFS is comprised of two parts (Stats SA 2008b: 15).

> "Part 1 comprises of seven questions: two general questions to establish household membership etc.; and five socio-demographic questions (age, sex, marital status, population group, educational attainment). Persons aged 15 years and older are then screened to answer Part 2 of the questionnaire which has three sections. Each questionnaire allows for up to six household members to complete Part 2 on an individual basis" (Stats SA 2008b: 15).

In addition, there are four sections: Section 1 collects data on sociodemographic characteristics of all household members irrespective of age (Stats SA 2008b: 15). Section 2 examines individuals between the ages of 15 and 64 years old and determines their employment status (Stats SA 2008b: 15). The third section differentiates between those who are unemployed and those not economically active (Stats SA 2008b: 15). The final section includes questions on the hours of work, industry, occupation, and others of the employed (Stats SA 2008b: 15).

A second survey conducted by Stats SA is the Community Survey. Stats SA (2007) have argued that government's decision to move away from a 5-year to a 10-year census created a large gap in information pertaining to demographic and socioeconomic characteristics of the South African population (Stats SA, 2007: 10). The organisation therefore decided to conduct the Community Survey in 2007. The main objectives of the Community Survey were to:

- "Provide data at lower geographic levels than existing household surveys;
- Build human, management and logistical capacities for Census 2011; and
- Provide inputs into the preparation of the mid- year population projections" (Stats SA, 2007: 10).

The survey covered 16,173 enumeration areas out of 16,255 enumeration areas that were initially selected and 238,067 dwelling units out of 274,348 dwelling units that were eligible for interview. The questionnaire was divided into nine sections and among them, demographics, migration, fertility, and mortality over the last 12 months (Stats SA, 2007: 10). The survey wasalso nationally representative, making it possible to analyse trends in fertility, mortality, and migration at a national, provincial, and municipality levels (Stats SA, 2007: 10).

A third type of survey that has been developed and is used in South Africa is the General Household Survey (GHS). According to the 2009 report:

> The GHS is a household survey that has been executed annually by Stats SA since 2002. The survey in its present form was instituted as a result of the need identified by the Government of South Africa to

> determine the level of development in the country and the performance of programmes and projects on a regular basis. (Stats SA, 2009: 1)

The survey was designed to measure "multiple facets of the living conditions of South African households, as well as the quality of service delivery in a number of key service sectors" (Stats SA, 2009: 1).

The questionnaire used covers demographic information (sex, name, age, population group, etc.), biographical information (health, disability, education, economic activities, etc.), household information (electricity, water and sanitation, type of dwelling, etc.), and food security, income, and expenditure (Stats SA, 2009: 2).

A fourth type of survey used is the October Household Survey (OHS). The OHS was an annual survey based on a probability sample of a large number of households ranging from 16,000 to 30,000 (Stats SA, 1997). The first OHS was undertaken in October 1993 (Stats SA, 2001). The 1994 round of the survey was the first to cover the whole country (Stats SA, 2001). The survey covered a range of development indicators, including the measurement of the unemployment rate according to standard definitions of the International Labour Organisations (ILO) (Stats SA, 1997). The census of 1996 constituted the sampling frame for selecting enumerator areas for the OHS in 1997 (Stats SA, 1997). The sampling procedure constituted stratification by province as well as metropolitan and district councils (Stats SA, 1997). Altogether, 3,000 enumeration areas were drawn by using theprobability proportional to size sampling method principles for the 1997 round of interviews (Stats SA, 1997). However, in 1998, due to budget constraints, the survey was reduced to 2,000 enumeration areas and 20,000 households (Stats SA, 2001).

These data sources have enabled authors to undertake their analyses. This is one of the most important endeavours Stats SA has undertaken to ensure that policy makers, programme implementers, and beneficiaries are effectively informed.

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2 Age Structural Transition of the South African Population
Racial Differentials and Implications

Mosidi Nhlapo and Henry V. Doctor

1. INTRODUCTION

Consistent fertility declines in large parts of the world over the last two to three decades have brought about a shift in interest from population growth to population age structure. The increase in the proportion of the working-age population (15–64 years) within developing regions and increases in the older population (65 years and above) in more developed regions has attracted attention towards the long-term impact of these shifts on the world's population structure. For example, the proportion of the world's elderly population was estimated at 6.9% in 2000 and projected to reach 15.6% in 2050, largely located within the more developed regions (United Nations, 2002). These structural changes have posed challenges such as insufficient levels of economic development to cater for a growing working population in developing countries (Madsen, Daumerie, and Hardee, 2010).

The demographic transition theory (DTT) deals with the transition of countries from high to low mortality followed by declines in fertility. The DTT has informed much of the discourse on population change (Weeks, 2010). Fertility and mortality transition inevitably bring about age structural transition (AST), that is, the shifting age structure from a younger to an older population. Pool (2005) defines AST as the passage of cohorts across key life-cycle stages. He identifies six stages of a population, namely childhood (0–14 years), youth (15–29 years), young adulthood (30–44 years), late adulthood (45–59 years), retirement (60–74 years), and old age (75 years and above). The intensity and length of AST waves are determined by the speed of fertility transition. Population scientists observe that a decline in the dependency ratio and an increase in the working-age population during the structural transition is a "demographic bonus" or "window of opportunity" (Navaneetham, 2002).

Since the 1990s, there has been an increased focus on the relationship between AST and development. Theories have emerged that deal with the effect of population on development. First, the "population pessimism" theory postulates that persistent high fertility in a low-mortality environment and accompanying rapid population growth inhibits development (Bloom,

Canning, and Sevilla, 2003). Second, the "population neutralism" theory contends that population growth, in isolation from other factors, has little impact on economic performance (Yu, 1990). Last, proponents of the "population optimism" theory argue that rapid population growth can promote economic prosperity by supplying abundant human and intellectual capital and increasing market size (Kuznets and Murphy, 1966). The experience of East Asian countries has also attracted a growing number of studies on the economic impact of AST (Bloom and Williamson, 1998).

Recent demographic trends in some parts of East Asia were an outcome of the demographic transition between 1965 and 1990. These trends were influenced by increased use of family planning in the 1950s (Yu, 1990). For example, total fertility rates (TFR) averaged 5.7 in the 1950s in East Asia and declined to 1.8 in 2005 (Weeks, 2010). As a result, the working-age population quadrupled faster than the dependent population (those aged 0–14 years and 65 years and above). Rapid structural changes triggered spectacular levels of economic growth in East Asian countries (Bloom, Canning, and Sevilla, 2003) such as Japan, Singapore, and Taiwan (Freedman, 1986). Some studies (e.g. Bloom and Williamson, 1998; Kreager and Schröder-Butterfill, 2003; Yu, 1990) have documented that in addition to the effect of transition on their economies, most East Asian countries also had the right fundamentals such as a work ethic, an educated population, and the right macroeconomic environment.

The reduction in the proportion of the functional age groups (15–64 years) and increases in the nonfunctional age groups (< 15 years and 65 years and above) has become a reality in some European countries such as Sweden, France, and Italy. Wishardt and colleagues (2006) talk about the "second demographic transition" within the European Union (EU) brought about by three decades of low fertility. By 1995, the crude birth rate (CBR) and the crude death rate (CDR) for EU countries were 10 and 11 per 1,000 population, respectively. Southern and Eastern European countries recently registered a low TFR of between 1.3 and 1.6 children per woman. Trends in the AST, coupled with increasing life expectancy, have produced an ageing population in most of the EU, a situation unforeseen by the demographic theory (Bloom, Canning, and Sevilla, 2003).

Worldwide, increases in migration flows of largely economic migrants over the last few decades have been attributed to structural changes within certain regions. In developing countries, the working-age population has been increasing, sometimes disproportionately to the available job opportunities. Further, population ageing in more developed regions has led to an increased proportion of the elderly population and a decrease in the proportion of the working-age group. Demographic forces can have two effects on emigration: directly, by raising the young adult share, and indirectly, by glutting the home labour market and thus worsening employment conditions within a country (Hatton and Williamson, 2002). Within most EU countries, migration has become an important source of demographic

change (Wishardt et al., 2006). The out-migration of younger workers from the sending regions also tends to deprive these countries of the skilled manpower attracted to the more developed regions (Adioetomo et al., 2005). This out-migration perpetuates the social and economic development inequality between the affected regions.

African countries and sub-Saharan Africa (SSA) in particular represent a group of countries globally that are still in the second stage of the demographic transition. Fertility transition is yet to occur in most of SSA, except for a few southern African countries such as South Africa that have annual growth rates of below 1% (Gaisie, 1996; Population Reference Bureau, 2009). Against this background, this chapter explores the AST and its implications on socioeconomic development in South Africa. Using Statistics South Africa's (Stats SA's) population estimates, we project the structure of the population to the year 2020 and assess the implication of these structural movements for the country. We adopt six life-cycle stages of a population, namely childhood, youth, young adulthood, late adulthood, retirement, and old age (Pool and Wong, 2006), and attempt to locate South Africa's transition within these cycles. Specifically, we examine the demographic trends by population group, project the population by racial group, and assess the implications of long-term structural changes. The reported demographic transition is bound to have demographic and socioeconomic implications for the country, with a need for policies that address the consequences of the transition.

2. DEMOGRAPHIC TRENDS

2.1. Fertility, Mortality, and Life Expectancy

South Africa, as well as other southern African countries, has commenced its fertility transition. TFR declined steadily over a number of decades, from an average of 6 children per woman to 2.4 in 2012 (Population Reference Bureau, 2012). Life expectancy at birth was estimated at 50 years in 2008, a decline from 62 years in 1985. The decline in life expectancy is attributable to the HIV/AIDS epidemic. The CBR and CDR were estimated at 21 and 12 per 1,000 population, respectively in 2012, whereas infant mortality rate was estimated at 38 deaths per 1,000 live births in 2012 (Population Reference Bureau, 2012). The population growth rate was estimated at 0.82% in 2008. This trend, in which fertility decline has been occurring in a declining-mortality environment, is observed for a number of countries in Southern Africa, strongly in contradiction of the DTT.

The fertility transition in South Africa has been largely influenced by the early onset of male migration and subsequent availability of contraceptives (Caldwell and Caldwell, 2003; Dorrington et al., 2004; Moultrie and Timaeus, 2002). The decline, accompanied by increasing birth intervals, occurred among women of all ages. Figure 2.1 shows TFR (from various

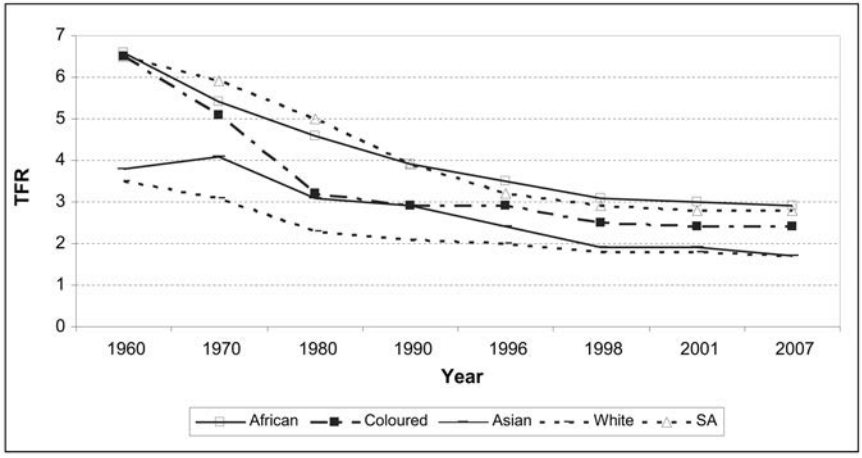

Figure 2.1 Period total fertility rate (TFR) by population group, South Africa, 1960–2007

sources) for South Africa and by the main population groups. As with most indicators, the national estimates mask the vast racial differentials across the four main population groups.

There is general consensus that White fertility rates reached replacement level (TFR of 2.1) in the late 1980s (Palamuleni, Kalule-Sabiti, and Makiwane, 2007; Udjo, 2005). By 2006, the White TFR was estimated at 1.7 (Stats SA, 2010), far below the replacement level. The fertility of Whites in South Africa tends to mirror that of most developed countries in both its level and its shape.

Asian fertility started declining in the 1950s due to increasing age at marriage and effective use of contraception (Palamuleni, Kalule-Sabiti, and Makiwane, 2007). Their fertility reached replacement in the late 1990s, and by 2007 it was estimated at 1.73, making Asians and Whites the two groups with the lowest fertility rates in South Africa. Estimates for 2007 indicate that fertility rates of Africans and Coloureds have started to approach replacement level. TFR for Coloureds is slightly higher than the African estimate at 2.4. Since Africans constitute a majority of South Africa's population, the course of the national TFR is mainly determined by the fertility schedule of the African population.

Unlike East Asia, where AST was fuelled by declines in fertility and accompanying increases in life expectancy, South Africa is facing a number of health challenges, notably the HIV/AIDS epidemic, which is depleting the working-age population. This is particularly the case for Africans. The previous decline in South Africa's mortality was reversed with the advent of HIV/AIDS (Stats SA, 2006). By 2008, HIV/AIDS prevalence was estimated at 11% (Stats SA, 2008). Table 2.1 shows estimated life expectancies for

Table 2.1 Dependency ratios and median age for South Africa

South Africa	**1996**	**2001**	**2007**
YDR	56.4	50.9	48.7
TDR	64.4	58.7	57.1
OAD	7.9	7.8	8.5
Median Age	22.6	23.6	24.3
Africans	**1996**	**2001**	**2007**
YDR	61.6	55.1	53.5
TDR	68.8	62.1	60.9
OAD	7.1	7.0	7.4
Median Age	21.3	22.2	22.8
Coloured	**1996**	**2001**	**2007**
YDR	52.7	47.5	43.1
TDR	58.4	53.6	49.8
OAD	5.7	6.2	6.7
Median Age	23.5	24.8	26.1
Asian	**1996**	**2001**	**2007**
YDR	40.0	32.4	30.1
TDR	45.6	38.9	37.9
OAD	5.5	6.5	7.8
Median Age	26.6	29.0	30.3
White	**1996**	**2001**	**2007**
YDR	31.4	27.2	23.7
TDR	46.7	42.9	41.3
OAD	15.3	15.7	17.6
Median Age	33	35.3	38.0

Source: Census 1996, 2001; South Africa Community Survey, 2007

South Africa from 1985 to 2020. Results indicate declining life expectancies, though estimated to stabilise over time.

There is a growing debate about the effect of HIV/AIDS on fertility in South Africa and the rest of SSA (Borgschulte, 2006; United Nations, 2002). Some have argued that the HIV/AIDS epidemic could cause a sufficiently large decline in fertility to result in negative population growth in

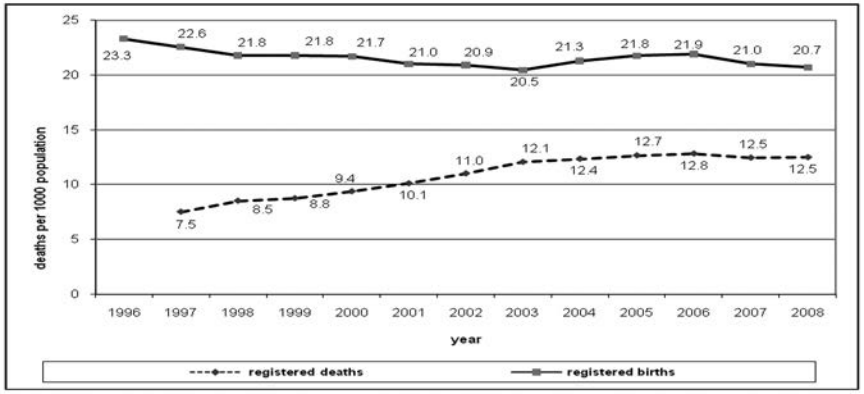

Figure 2.2 Crude birth rates and crude death rates for South Africa, 1996–2009
Source: Stats SA published births and deaths data, adjusted for completeness

South Africa and the subregion (UNFPA, 2002 quoted in Anderson, 2003). Borgschulte (2006) points out that South Africa is considered an outlier in SSA, mainly because fertility was already declining at the onset of the HIV/AIDS epidemic. Bulatao (2006) states that AIDS impedes progress toward lower dependency ratios since it increases adult mortality more than infant and child mortality. Garenne, Tollman, and Kahn (2007) caution that the results of most studies only provide evidence of the effect of HIV/AIDS on period fertility; effects of the epidemic on cohort fertility might be more pronounced.

Figure 2.2 shows trends in CBR and CDR since 1996. The DTT places much emphasis on mortality decline as a precondition for fertility reduction. In South Africa and other southern African countries affected by HIV/AIDS, these preconditions have not been met. While the trends in CBR show a steady decline, trends in CDR are reversed. The CBR was estimated at 23.3 births per 1,000 population in 1996, declining to an estimated 20.8 births per 1,000 population in 2009. For CDR, the opposite trend is observed, with estimates of 7.5 in 1997 increasing to 12.5 deaths per 1,000 population in 2008.

3. DATA AND METHODS

We project the South African population from 1985 to 2020 using Stats SA's population estimates. We use the Demproj and AIM programs of the Futures Group's Spectrum Policy Modeling System, a population projection system used within Stats SA. The age structure of mortality is estimated using the Far East Asia (within the United Nations joint programme on

HIV/Aids [UNAIDS] family of life tables) pattern of mortality (Stats SA, 2008). Fertility patterns are based on official assumptions of Stats SA. The 1996 and 2001 population censuses and the 2007 Community Survey are used to compute dependency ratios for each of the four population groups.

4. RESULTS

4.1. Dependency Ratios

The twenty-first century has heralded a favourable shift in dependency ratios (a measure of the economic burden imposed on the working-age population to support the nonworking population). This shift has been an outcome resulting primarily from rapid declines in fertility during the demographic transition (Yu, 1990). Developing countries are currently experiencing a large proportion of their populations concentrated in the working-age group.

On the one hand, countries with young population structures (aged 0–14 years) need investments in critical areas such as education. On the other hand, countries with older populations (65 years and above) need investments that focus on health and social services (Navaneetham, 2002). For the four population groups in South Africa, the dynamics are complex. Table 2.2 shows the total dependency ratios (TDR; the ratio of individuals aged 0–14 years plus those aged 65 years and above to those aged 15–64 years), young dependency ratios (YDR), old-age dependency ratios (OAD), and median ages for South Africa by population groups for 1996 to 2007. Table 2.2 confirms declining TDR for the four population groups, albeit at different levels. South Africa's median age rose from 22.6 years in 1996 to 24.0 years in 2007. By 2007, there were 49 young children (0–14 years) for every 100 South Africans aged 15 to 64 years as indicated by the YDR. Old-age dependency ratios remained within single digits. The proportion of children declined from 34% to 31% (not shown). Systematic declines in the proportion of the population aged 0 to 14 years have been accompanied by gains in the proportion of the economically active sections of the population increasing from 61.0% to 63.6% in the same period.

The African population has the youngest population structure of the four groups. Their median age increased from 21.3 years in 1996 to almost 23.0 in 2007. Their TDR declined from 68.8 in 1996 to 61.0 in 2007. Table 2.2 shows that even by 2007, the African OAD ratios were still much lower, with only 7 old people (aged 65 years and above) per 100 Africans aged 15 to 64 years.

The Coloured population TDR and median age are positioned between the Asian and the African population groups' estimates. Much like the African age structure, the Coloured population structure is young, with dependency ratios still biased towards younger ages and young dependency ratios of 43 in 2007.

Table 2.2 Dependency ratios and median age for South Africa, 1996, 2001, and 2007

SA	**1996**	**2001**	**2007**
YDR	56.4	50.9	48.7
TDR	64.4	58.7	57.1
OAD	7.9	7.8	8.5
Median Age	22.6	23.6	24.3
Africans	**1996**	**2001**	**2007**
YDR	61.6	55.1	53.5
TDR	68.8	62.1	60.9
OAD	7.1	7.0	7.4
Median Age	21.3	22.2	22.8
Coloured	**1996**	**2001**	**2007**
YDR	52.7	47.5	43.1
TDR	58.4	53.6	49.8
OAD	5.7	6.2	6.7
Median Age	23.5	24.8	26.1
Asian	**1996**	**2001**	**2007**
YDR	40.0	32.4	30.1
TDR	45.6	38.9	37.9
OAD	5.5	6.5	7.8
Median Age	26.6	29.0	30.3
White	**1996**	**2001**	**2007**
YDR	31.4	27.2	23.7
TDR	46.7	42.9	41.3
OAD	15.3	15.7	17.6
Median Age	33	35.3	38.0

Data source: Census 1996, 2001; Community Survey, 2007

The Asian TDR declined from 46 in 1996 to 38 in 2007, while their OAD ratio increased from 6 in 1996 to 8 in 2007. The Asian population has the second-lowest TDR after the White population. In 2007, the Asian population also had the highest proportion in the age group 15 to 65 years at 73% (not shown) and a median age of 30 years.

The median age for the White population was 33 years in 1996 and increased to 38 years in 2007. This population also has the highest OAD ratio, which was 15 in 1996 and increased to 18 in 2007. Their TDR declined to 41 in 2007 from 47 in 1996, the lowest of the four groups. For every 100 Whites aged 15 to 64 years by 2007, there were 24 persons aged 0 to 14 years.

4.2. Changing Age Structure

The South African population is about to enter a phase in which population growth will be driven by the composition factor. Figures 2.3 through 2.7 show the age structure for the total population and by population group from 1985 to 2020. The age groups are divided into "childhood," represented by the age group 0 to 14 years; "youth" by 15 to 29 years; "early middle age" by 30 to 44 years; "late middle age" by 45 to 59 years; "early retirement age" by 60 to 74 years; and "old age" by 75 years and above.

Figure 2.3 displays results of the projection for the national population. It is expected that South Africa will experience its first age structural shift from a "childhood" phase to a "youth" phase by 2015. The proportion of children (0–14 years) will decline to 27% from 41% at the beginning of the projection. Those aged 15 to 29 years will increase to about 30% of the total population, comprising the largest group in the country.

Only 3% of the national population was aged 65 years and above in 1985. This is projected to increase to 6.4% at the end of the projection

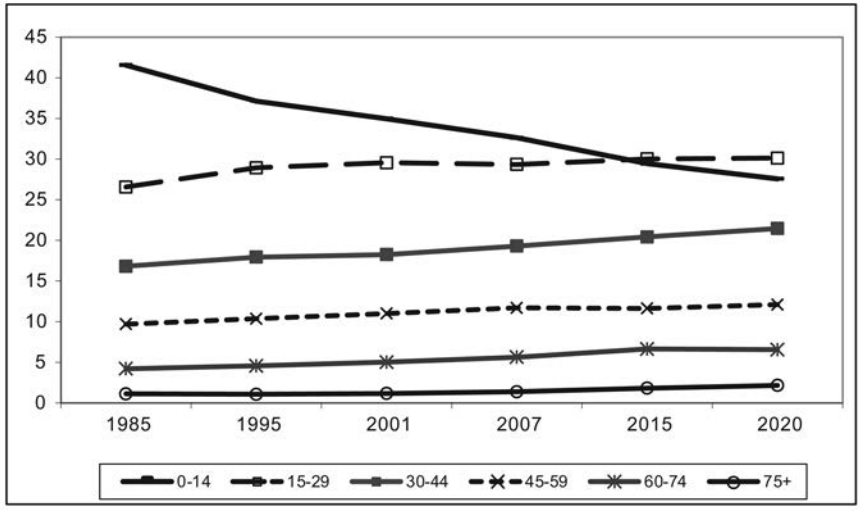

Figure 2.3 South Africa age structure, 1985–2020

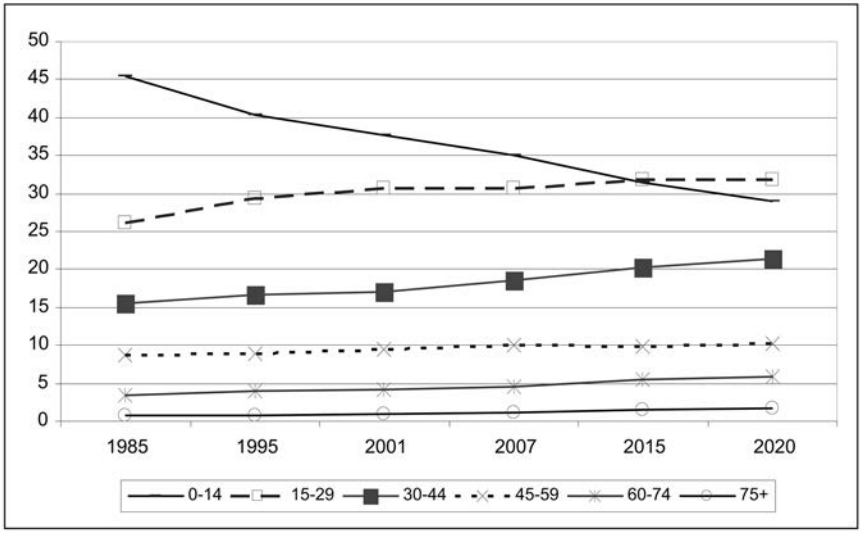

Figure 2.4 African population age structure, 1985–2020

period. According to the United Nations classification, a population is regarded as "old" if more than 7% of the population is aged 65 years and above, "*mature*" if between 4% and 7% are aged 65 years and above, and "young" if fewer than 4% are aged 65 years and above (United Nations, 2002). South Africa's population pyramid is expected to assume an increasingly convex shape in the years after 2015.

The African population will experience its first transition in 2015. About 32% of the African population will be in the age group 15 to 29 years. The 0 to 14 years age group is expected to constitute about 29% of the total African population.

By 2020, only about 5% of the population will be aged 65 years and above. Nair (2007) computed the index and tempo of ageing for Botswana for 1981 to 1991 and 1991 to 2001. He concluded that the two measures show signs of a slowing ageing process in Botswana, a process attributed to the impact of HIV/AIDS on the population structure. We computed these measures for the African population (highly affected by HIV/AIDS) from 1996 to 2007, using the 1996 and 2001 censuses as well as community survey data. The index was 17% in 1996 and increased to 20% in 2007. The tempo of ageing shows a slight slowing of the ageing process for African population between the periods 2001 to 2007 and 1996 to 2001 at 1.049 and 1.060, respectively.

Figure 2.5 shows age structural transition for the Coloured population. The first structural change occurred much earlier than the African transition, around 2010. Their population structure will also be dominated by the

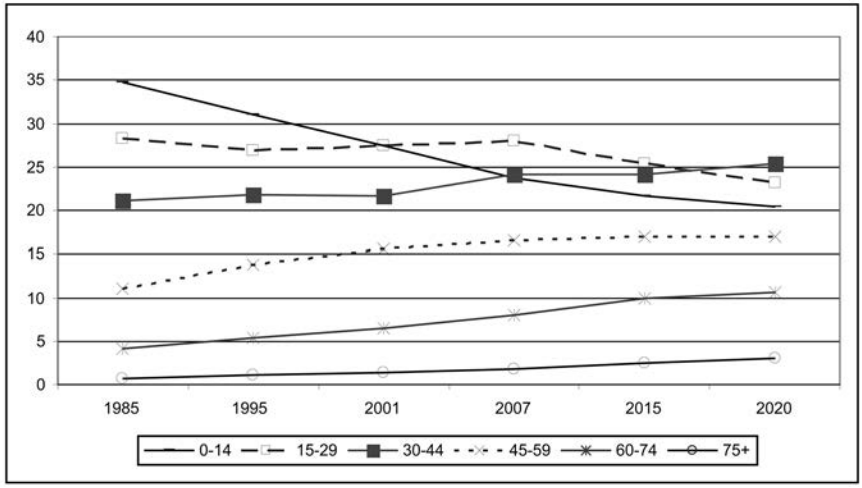

Figure 2.5 Coloured population age structure, 1985–2020

15 to 29 year age groups, constituting about 26% of the Coloured population, followed closely by the 0 to 14 year age group at 24.6%. Beyond 2020, the Coloured population will be approaching another transition, when the age group 30 to 44 years will start increasing above the 0 to 14 year age group. Age groups 45 to 59 and 60 to 74 years, what Pool (2005) refers to as the late middle-age and the early retirement cohorts, respectively, are expected to increase gradually beyond 2015 and will respectively constitute 16% and 8% of the Coloured population. About 6% of the Coloured population is expected to be in the age group 65 years and older by 2020, a figure slightly higher than the one obtained for the African population.

Figure 2.6 shows that the Asian population underwent the first shift in age structure around 2001, which saw their population structure dominated by the 15 to 29 years age group. It is expected that this group will continue to be dominant by 2015, when the second structural shift occurs, resulting in the group aged 30 to 44 years increasing to about 25% of the Asian population. The childhood population is expected to continue declining, constituting about 20% of the Asian population in 2020.

The bulge in the population structure of the Asian population is concentrated in what Pool refers to as the "early middle ages." Around 10% of the Asian population is projected to be in the 65 years and above age groups at the end of the projection period, making the Asian population the second-oldest population, after Whites, in South Africa.

The White population structure is the most complex of the four population groups. Figure 2.7 shows that its first structural shift occurred prior to the base year. At the beginning of the projection period, the 15 to 29 year age

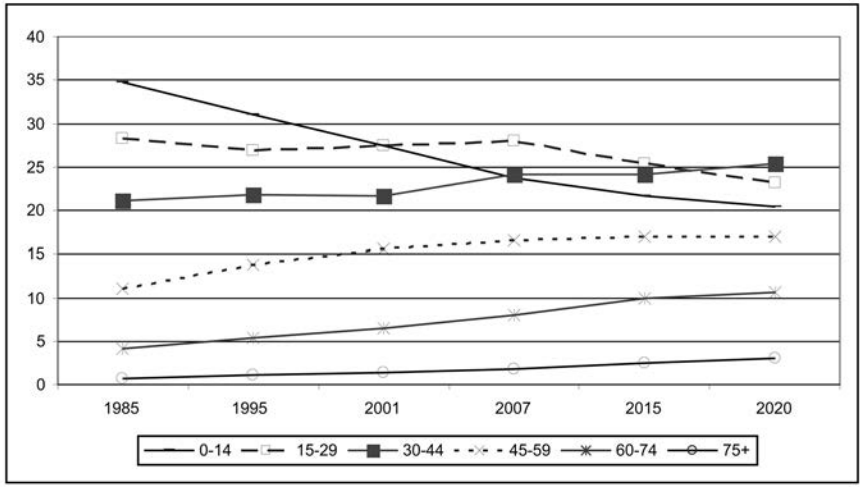

Figure 2.6 Asian population age structure, 1985–2020

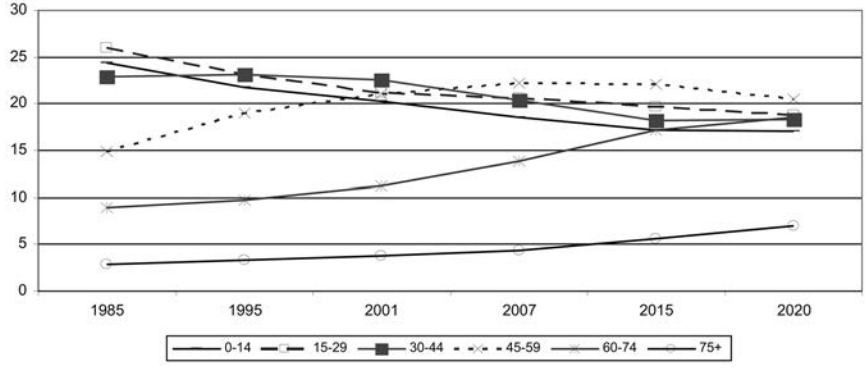

Figure 2.7 White population age structure, 1985–2020

groups dominated the White population structure, constituting about 26% of the population. The population will subsequently experience a number of transitions over the projection period. In 2020, only 17% and 19% of its population will be in the 0 to 14 and 15 to 29 year age groups, respectively. The 45 to 59 year age groups have dominated the White population age structure since 2007. This is expected to continue until the end of the projection, when another major shift in the structure occurs. The proportion of those aged 60 to 74 years (early retirement-age group) is expected to rise above the 0 to 14 year age group for the first time in 2015, projected to constitute 19% of the total White population by 2020.

5. IMPLICATIONS

The results of the projections indicate that the South African population should be entering the latter phase of the third stage of the demographic transition. However, increasing mortality poses a dilemma and creates uncertainties for the transition. Fertility is approaching replacement for Coloured and African population groups. The actual level of fertility that produces a perfect population replacement over time varies according to the mortality, mainly childhood mortality, to which the population is subjected (United Nations, 2001). Countries like South Africa with a high mortality, a TFR of 2.1, may already be below replacement. Some scholars have cited this trend among others as an indication of the limitation of the DTT in explaining the transition in most of SSA (Gaisie, 1996; Leahy, 2007).

South Africa is poised to become a transitional society by 2020, when 58% of the population will be below the age of 30 years. A transitional age structure occurs when between 45% and 60% of the population comprises young people under age 30 (Leahy, 2007). The population composition of the country is largely dictated and mirrored by the African structure. For the Coloureds, this figure will be 50%. Asians and Whites will reach the posttransition stage. For them, these proportions will be 44% and 35%, respectively, by 2020. Despite the changes noted, the South African population will continue to grow, at least into a considerable future. For instance, around 2.1 million people will be added to the total population between 2010 and 2020, largely due to population momentum.

5.1. Childhood Population

Although the young population (0–14 years) is projected to decline from 2015 and beyond, it still constitutes about 27% of the population, the second-largest group. The majority within this group will be Africans (29%) and Coloureds (25%). This shift has implications for education and health within this group. Despite achieving universal primary school enrolment, South Africa's education system still faces some challenges. Approximately 40% of young children in South Africa grow up in conditions of abject poverty and neglect (DoE, 2001). Kraak (2008) notes the impact of declining fertility, increasing poverty, and the HIV/AIDS pandemic on school enrolment, from 1,208,2009 in 1998 to 11,762,045 in 2004. Panday and Arends (2008) point to overenrolment in Grades 1 and 2 due to high levels of repetition. Various interventions have been implemented to mitigate the impact of these problems. Among the most prominent interventions was the introduction of the National Integrated Plan on Early Childhood Development. The programme focuses on expanding the participation of preschool-age children within the reception phase of schooling (South Africa Department of Education, 2001). Indications are that the programme is starting to bear fruit. The General Household Survey (Stats

SA, 2011) shows an improvement in coverage of this group as evidenced by increases in the proportion of 5-year-olds in Grade R from 40% in 2002 to 62% in 2005. Other efforts by the South African government were the introduction of "no-fees schools" and the school feeding systems within poor communities. The policy of no fees was introduced in 2007 to promote equity and reduce the dropout rate. The National School Nutrition Programme is a response to nutritional needs of pupils in Grade R to Grade 7 from poor households. The programme benefits around 6 million pupils in more than 18,000 schools annually. Declining pressure on the demand for education at lower grades due to the transition can help improve the quality and efficiency of the education system if the right interventions are implemented.

Regarding health, the most pressing challenge facing South Africa is the provision of health care services, largely due to the impact of HIV/AIDS. South Africa, like many countries experiencing the HIV/AIDS pandemic, had seen a reversal of earlier mortality gains. Between 1990 and 2007, under-5 mortality declined slightly in South Africa, from 49 to 46 per 1,000 live births (UNICEF, 2009). About 60% of under-5 deaths were associated with malnutrition, while 75% of severely malnourished children had signs of advanced HIV infections (UNICEF, 2009). The introduction of the programme for the prevention of mother-to-child transmission (PMTCT) has improved maternal and child health. Close to 60,000 children were on antiretroviral therapy in 2008, representing 61% coverage (UNICEF, 2009).

5.2. The Working-Age Group

The 15 to 29 year age group constitutes a large part of the working-age population (15–64). The working-age group will continue to grow for the duration of the projection period. All population groups are projected to have the largest proportion of their populations within this age group by 2020. About 66% of Africans will be in the working-age group in 2020. This figure will be 65% for Coloureds and 69% and 64% for Asians and Whites, respectively.

The growth rate of the group aged 15 to 64 above the population growth rates signifies the opening of a window of opportunity. According to Leahy (2007), countries have a time frame of 40 to 60 years within which to take advantage of the benefits of the demographic dividend.

Of interest in this section is the distribution of the various smaller segments within the working-age group, which indicate transition differentials between the groups. We classify these subgroups as entry phase (aged 15–29 years) followed by the middle-aged worker phase (aged 30–44 years) and mature workforce (45 years and above).

5.3. Entry Phase (15–29)

Africans and Coloureds will have the larger proportion of their populations within the entry phase. Adioetomo and colleagues (2005) note that the 15 to 29 year age group has the highest "demographic density," that is where all sorts of life-status changes occur, such as leaving school, entering the labour market, starting a family, and migrating. The age structure of Africans and Coloureds is the one that is likely to present challenges for South Africa. Together, these two population groups will have around 56% of their population in this phase.

One of the most important resources a country has is its human capital. This has implications for labour productivity for the country and revenue levels for the government. Positive outcomes of a broadening and better-educated workforce stemming from a strong educational system and sound economic fundamentals have been demonstrated by East Asian economies. Bloom, Canning, and Sevilla (2003) identify three of the most important mechanisms that deliver the demographic dividend: labour supply, their quality and skill being due to investment in education and other factors; savings; and human capital, which is a function of the social and cultural organisation of a population.

The most critical challenge for South Africa will be generating new employment to absorb the expanding entry-phase population. South Africa has experienced an extended period of structural unemployment. The discourse on the causes of persistently high unemployment, even during the periods of unprecedented economic growth, have largely located the causes in the structural defects within the economy (Altman, 2002; Bhorat; 2001). Kraak (2008) notes that it was largely the tertiary sector that was responsible for the growth of the gross domestic product (GDP) during the period of economic growth in South Africa. The mining and manufacturing sectors shed jobs, reflecting the changing structure of the economy.

Bhorat and Oosthuizen (2008) dispute the notion of increasing unemployment and increase in joblessness within the South African economy. The authors argue that between 1995 and 2005, the country had insufficient employment growth relative to the growth in the labour force. According to these authors, during this period, 2.8 million new jobs were created, while the labour force expanded by 6.3 million, more than twice the figure. Stats SA (2009a) showed that in 2008, about 42% of the unemployed were new entrants into the labour market, followed by 30% who lost their jobs. About 54% of new job entrants in that year were in the age group 15 to 24 years. Bhorat and Oosthuizen (2008) estimate that for all new entrants to acquire employment in the labour market, new jobs need to grow at a rate of 66%, compared to the 29% experienced during that period. Stats SA (2009b) showed that young people consistently had the lowest labour force participation rate; a majority of these were Coloureds and Africans.

The second important issue is the skill level of the labour force. Manufacturing and trade have been among the most important catalysts for development in most emerging markets, among them China, Taiwan, and Japan. Economic growth in these countries was driven mainly by increases in highly technical, skills-intensive sectors such as the electronic and automobile sectors. This provides an indication of the level of investment made by these countries in their labour force. Among some of the major constraints to economic growth identified by analysts has been the decline in the manufacturing sectors and the rise in the cost of skilled labour, as well as a skills mismatch between tertiary education and job market requirements (Erasmus and Breier, 2009). Others have noted high dropout rates after the compulsory General Education and Training (GET) phase (Grade 1 to 9). The highest dropout rates have been observed from ages 16 to 18 years (roughly Grades 10 to 12; Panday and Arends, 2008). The creation of the Further Education and Training (FET) colleges was partly intended to improve skills development. Evidence elsewhere shows that investment in FET tends to open possibilities for youth employment at intermediate skill levels, where there are many opportunities (Kraak, 2008).

A growing 15 to 29 age group will also likely increase the demand for housing. South Africa has a housing backlog, which is more pronounced among Africans and Coloureds. The Community Survey of 2007 revealed that almost 20% of households (largely Africans) still live in informal dwellings.

5.4. Middle-Aged-Worker Phase (30–44)

The composition of the working-age Asian population went through two structural shifts during the course of this projection. The second transition is expected around 2013, when the 30 to 44 age groups will dominate the Asian population structure. About 25% of the Asian population will be in this age group by 2020. Another important aspect of this phase is the saving behaviour and the life experience of the population (Bloom, Canning, and Sevilla, 2003). Saving within this phase is largely practised towards children's education. However, the Asian population constitutes only about 3% of the total population. Thus, at national level, their age transition can hardly make any impact.

5.5. Mature Workforce

The White working-age population went through several structural shifts between 1985 and 2015, from the entry phase to middle-aged-worker phase and then to the mature workforce. The 45 to 59 years age group currently dominates its age structure, though its influence will begin to decline from 2015 as the 60 to 74 years age group becomes dominant.

Skills and savings are very important contributions that populations in the phase 45 to 59 make to the country. According to Bloom and colleagues (2003), savings tend to increase between the ages of 40 and 65. The rationale for saving also shifts away from investing for children's education during the early phase of work life towards capital asset and wealth accumulation in preparation for old age. Research on consumption patterns in South Africa show that spending patterns of Whites have been towards asset-building activities and retirement (Stats SA, 2008). Expenditure within the other three population groups was concentrated on wealth transfer expenditure such as children's education (Mhango, 2005; Nieftagodien and van der Berg, 2007; Stats SA, 2008). Stats SA (2010) also found that White households continue to have the highest percentage within the middle class.

An increasing working-age population is also associated with increasing demands for goods and services. Demand for housing and related goods and services such as furniture for those segments within this larger age group (15–64 years) that are at the family formation phase are some of the key features of this group. The savings benefit for mature age structure, such as the one projected for Asians and Whites, can only be realised if policies that encourage saving are pursued in the country, as was the case in Singapore (Navaneetham (2002). Additionally, private household savings can provide capital needed to finance growth at country level, as documented in East Asia, and provide a social net at later stages of life in the form of capital income (Bloom, Canning, and Sevilla, 2003).

5.6. The Older Age Group

By 2020, 25% and 14% of Whites and Asians, respectively, will be in the age group 65 years and above. Feng and Mason (2005) postulated various models to address the challenges of an ageing population. The first model is the social intervention model, where transfers occur either through the family or through the state. The second model is the capital accumulation model. The former works better in societies where the extended family is strong. Results from the 2001 census showed that Whites had the highest proportion of single-person households of all population groups (Stats SA, 2003). Social intervention models will not benefit this population since they require intergenerational transfers. Whites have the highest standard of living in South Africa (Nieftagodien and van der Berg, 2007; Stats SA, 2010). The capital accumulation model is the appropriate model for Whites and might ensure that they are properly cushioned for ageing. The Asian population, on the other hand, still has a strong social system that can sustain the social intervention model or intergenerational transfers. More structured skills-development interventions are needed in order to address challenges of labour force age structure targeted at increasing the skills base of Coloureds and Africans.

6. CONCLUSIONS

This chapter explored the process of age structural transition in South Africa. The results show that age structural transition (AST) is not uniform among the four main population groups. The differences in transition are due to differences in fertility and mortality transition. Broadening working-age population and declining dependency ratios will present opportunities to improve the quality of life of children. The expanding youth population produced by the demographic transition produces favourable conditions for a demographic dividend. Independently, the transition does not guarantee that an increased supply of workers will produce positive results for the country. The country needs to create new employment opportunities proportionate to the growth rate of the working-age population. Unemployed youth who have no prospect of work and income may give rise to serious problems. Already there has been some concern about the high levels of criminality in South Africa. An increasing young population might compound some of these problems.

Skills-development efforts must focus on population groups that are projected to grow, in this case Africans and Coloureds. Ways to harness the benefits of a mature and stable population such as the White population structure must be found, including tapping into the skills and expertise within both Asian and White populations. This might involve extending the retirement age for these population groups while the country builds the skill base in the other two populations with a young age structure.

Impending ageing within the White and Asian populations needs further analysis to broaden the understanding of associated benefits and threats for South Africa and specifically for these two affected population groups. When people grow old, their individual productive capacity tends to decline, while their health needs increase. The social, economic, and political consequences of population ageing will therefore become significant factors in all policies and programmes directed at these sections of the population.

The growing African and Coloured working-age population will provide an adequate labour cushion for ageing groups within the country from challenges experienced in developed regions, where concerns of a declining workforce have become pertinent. This is conditional on full employment for these groups.

We know that below-replacement fertility and lower mortality produced an older population in developed countries mainly due to increasing life expectancies. The big question for South Africa and other countries in southern Africa is what the end result of declining fertility and increasing mortality will be. Equally, increasing infant and child mortality has the same impact on the population structure as fertility decline. The issue of whether the country has already reached replacement fertility as implied by its mortality level is important to demography and warrants further research. Last,

interprovincial migration and the likely effect on spatial variation of age structure across the provincial boundaries may be another interesting theme for the future study of migration. South Africa might need to start including solutions that address challenges posed by the transition in all population planning processes.

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3 An Assessment of Quality of Death Registration Data for Mortality Estimation in South Africa

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1. INTRODUCTION

Owing to the lack of reliable death registration data in the developing world, interim measures were initiated to provide information on vital events. Demographic health surveys (DHSs), sample vital registration systems, and demographic surveillance sites (DSSs) have been reasonable substitutes in countries without complete civil registration systems, with the exception of the assessment of causes of death (Hill et al., 2007, p. 1). However, these interim approaches are prone to misreporting. Also, retrospective reports such as censuses and surveys may not give timely information of mortality crises. Continuous registration of vital events with medical certification of deaths through a civil registration system is the only satisfactory mechanism.

In the case of South Africa, completeness of death registration was found to have incrementally improved in the past decade (Bah, 2005; Dorrington, 2001; Udjo, 2005). Even so, these data are still not utilised for mortality estimation. Reasons for the underutilisation include the time lag between the death occurrence and production of death statistics, suspicion that these data exclude some rural populations, and the uncertainty about the content quality of death notification forms. The time lag between death occurrence and the production of death statistics has been recently reduced to two years, while vigorous campaigns by the Department of Home Affairs are continuously improving coverage. The uncertainty about content quality remains.

This chapter, therefore, seeks to investigate the potential for usability of these data for mortality estimation. To accomplish this, there is a need to estimate completeness of these data and thereafter calculate mortality measures and compare patterns and trends with other data. Cause-specific mortality is also included in the analysis to assess the plausibility of reflected epidemiological experiences with expectations.

1.1. The Process-of-Death Registration System in South Africa

Legislation mandates compulsory death registration (Birth and Death Registration Act 51 of 1992) for all people who die within the country. In almost all cases, health personnel are required to certify death. This is straightforward if death occurred in the hospital, whereupon death certification, individual family, or funeral undertaker registers the death at the local Home Affairs office for acquisition of the abridged death certificate. If death occurred at home or elsewhere, that death is registered by the funeral undertaker or the individual family at the local municipal office for acquisition of burial space as well as at the Municipal Home Affairs office. It should be noted, though, that in some cases, such deaths are first registered at the Municipal Home Affairs office first and thereafter registered at the local municipal office. All unnatural deaths and those that occurred on arrival at health facilities are taken to local government mortuaries for autopsy. In the case of rural areas, where health services may not be easily accessible, traditional chiefs are required to certify death by interviewing family members.

While capturing of death notification forms is done at local offices of the Department of Home Affairs to update the population register (only the first page) and for provision of abridged death certificates, capturing of all items is done at the National Department of Home Affairs for the provision of unabridged ones. The population register captures those deaths with a recorded South African identity number. Statistics South Africa collects the original death notification forms from the National Department of Home Affairs for the production of vital statistics.

1.2. Processing of Death Notification Forms

There was a backlog of seven years in the compilation of death statistics in South Africa in 2004 when the government sought information on causes of death in the country. The backlog had been caused largely by limited human resource capacity within the Vital Statistics division at Statistics South Africa, coupled with the fact that death notification forms are coded and verified manually, which often consumes a lot of time. As a result, only 15% of death certificates were processed annually. In order to work towards addressing the backlog, Statistics South Africa had to process death certificates from 1997 to 2003 in one project in 2004, while death certificates for subsequent years were processed individually on an annual basis (Statistics South Africa, 2005).

The acquisition of forms from Home Affairs is not systematic since there is no cut-off date for a specific publication. In some cases, the two pages pertaining to one form (copy of death notification form provided in the

appendix) get separated at Home Affairs during data capturing. Therefore, Statistics South Africa has to match these two pages before processing data. This procedure causes unnecessary delays, and some of the forms remain unmatched, contributing to under-registration in the form of not being reported to the statistical agency.

If page two is missing (about 300 to 400 cases annually), the first page can still be processed because it has the date of death but not cause-of-death information. But if page one is missing (about 100 to 200 cases annually), the case cannot be processed because there is no date of death on page two. Many forms are not fully completed, with the omission of variables such as population group, geographical area of birth, residential place, education, and, if the deceased was a woman, whether she was pregnant when she died. There is also lack of detail on causes of death on many forms.

Upon receiving death notification forms after being scanned at the National Department of Health for processing at Statistics South Africa, unique numbers are pasted on each, and all other variables are coded except causes of death. Coding of causes of death on death notification forms is done by professional coders using the International Classification of Disease (ICD-10) coding rules. Capturing of all variables is followed by the selection of the underlying cause of death using the Automated Classification of Medical Entities (ACME).

This chapter intends to examine and establish the potential for usability of death registration data for mortality estimation. Specific objectives include estimating completeness of death registration data for the 1996 to 2001 intercensal period as well as the period within Census 2001 and the 2007 Community Survey (CS); comparing adjusted mortality measures with other data; evaluating plausibility of cause-specific mortality against expected epidemiological experiences; and rating the content quality.

1.3. Application of Indirect Methods in Developing Countries

Various methods have been developed in the past several years in order to correct death registration data for underreporting. Indirect methods of estimating completeness are usually used in developing countries, where deaths are underreported by a significant margin. These methods are characterized by estimating completeness of death registration from age 5 and above, as well as providing estimates of completeness relative to census enumeration.

Those that assume a constant population growth rate with zero migration are separated from those that do not assume stability. Also, input requirements differ, depending on the focus of the specific method. For example, those that do not assume stability require the use of two censuses, whereas stable methods are applicable even when population data are available from only one census (Bennett and Horiuchi, 1981, p. 208).

Due to fewer input requirements, stable methods may be preferred over the ones that do not assume stability. However, the plausibility of such estimates has been questioned. There is a tendency for underestimation of completeness. For example, the extended Preston and Hill method yielded a completeness of 58% for Korean females in 1970 to 1975. In contrast, the Synthetic Extinct Generations (SEG) method that does not assume stability yielded a completeness of 65% for the same population and period. Limitations are also noticeable for methods that do not assume stability. Sensitivity to misreporting of age and change in census coverage are among observed limitations (Hill, 2003, p. 3).

While Hill and Choi (2004a) attempted to test how well the Generalised Growth Balance (GGB) and SEG methods perform in the context in which data deficiencies violate the assumptions underlying the models, they concluded that each method had strengths and weaknesses and, therefore, accurate estimates of completeness of death registration can be obtained by using a combination of the two methods. A two-stage process of using the GGB method first to estimate coverage of one census relative to the other and then applying the SEG method to corrected age populations to estimate completeness has been proposed. However, Dorrington and colleagues (2008) argued that the applicability of GGB-SEG combination is more restricted than has been suggested.

1.4. Application of Indirect Methods in South Africa

Nevertheless, indirect methods of estimating completeness that assume stability were applied in several studies in South Africa. Udjo (2005, p. 472) applied Brass's sectional growth balance on death registration data for the period 1997 to 2002. He found that completeness increased from 79% in 1997 to 92% in 2002. In his conclusions, it was noted that due to controversies around the age-sex structure of official population estimates in South Africa, these estimates should be treated as upper limits.

In contrast, Dorrington and colleagues (2001, p. 29) applied the SEG method to estimate completeness of death registration from 1997 to 2000. Population Register deaths were scaled up to allow for deaths reported but not on the Population Register. This is because deaths that had no national identity number recorded were excluded from the Population Register. The researchers assumed that majority of these are for children who died before their births were registered. Completeness was found to have increased from 87% in 1997 to 89% in 2000. These estimates are not comparable with those derived by using stable methods mentioned earlier. However, the increasing trend is also apparent. Hill and Choi (2004a) indicated that there is no consensus on which method should be preferred. The choice of method to be used for estimation is generally based on availability of data, applicability of the assumptions, and limitations of each method. However, it should be noted that owing to unique assumptions and differing strengths

and weaknesses between techniques, correspondence among results may be either weak or non-existent.

This study utilises both the GGB and the SEG methods individually for the purpose of comparing the estimates of death registration completeness derived. In the case of South Africa, both immigration and emigration statistics are underreported. However, the notion maintained is that immigration from the neighbouring African countries is higher than emigration, although not documented. Evidence of this is apparent in the wide guesses noticeable in research and the continuous mentioning of probable xenophobia attacks. As a result, application of the aforementioned methods assumes zero international migration.

1.5. Studies on Content Quality

Similarly, with completeness of death registration, studies on content quality pertain largely to developing countries. Unlike indirect methods of calculating completeness, there are no specific methods developed as yet for measuring the content quality of death registration data. The World Health Organization provides some yardsticks for the evaluation of content quality. These include proportion of deaths that are certified in hospitals, proportions of nonresponse, and the proportion of "ill-defined" causes. Content quality can be rated "satisfactory," "unsatisfactory," or "not known" (Setel et al., 2007, p. 2).

Clarity of these yardsticks is only provided for the proportion of "ill-defined causes," where more than 10% suggests low data quality. Regarding the other two, researchers may be expected to use their own discretion. Therefore, content quality that may be observed as "satisfactory" by one study can be considered "unsatisfactory" or "not known" by another.

For China, content quality of mortality data from the Ministry of Health-Vital Registration (MOH-VR) and the Disease Surveillance DSP systems was rated "satisfactory" with a completeness of 70% from 1995 to 1999 (Rao et al., 2005, p. 620). Fewer than 10% of deaths were assigned to "ill-defined" causes. That notwithstanding, there were inconsistencies in causes-of-death statistics for both data sets. Completeness could not be estimated for the MOH-VR data. As a result, different ratings were provided for different aspects of these data. This may suggest that although completeness of death registration may be improving in developing countries, content quality is lagging behind. This is so specifically for cause-of-death statistics.

2. DATA SOURCES AND METHODS

Data for this work were obtained from different sources. These are vital registration data collected by the Department of Home Affairs and processed at Statistics South Africa from 1997 to 2007 and population register deaths from October to December 1996, as apportioned for the 1996 to

2001 intercensal period. Such deaths were accessed from the population register at the Department of Home Affairs since Statistics South Africa's data commence from 1997. In addition, population and household deaths enumerated by Censuses 1996 and 2001 as well as those enumerated by the 2007 Community Survey were utilised to calculate age specific death rates.

2.1. Proposed Frameworks for Assessment of Quality of Death Registration

Several frameworks for assessment of death registration data were proposed by different researchers. This study draws on three: Rao and colleagues (2005), Mahapatra and colleagues (2008), and França and colleagues (2008). The four categories of the frameworks used by Rao and colleagues (2005) and França and colleagues (2008)—namely generalisability, reliability, validity, and policy relevance—are similar. Also, criteria and indicators used are broadly similar. However, the framework used by Mahapatra and colleagues (2008) proposes two categories, namely general vital statistics and cause-of-death statistics. That notwithstanding, criteria and indicators used to assess quality of death registration data are also broadly similar to the other two.

Rao and colleagues (2005) proposed coverage and completeness under the category of generalisability, consistency of cause-specific patterns with general mortality, and consistency of cause-specific mortality with expected epidemiological experiences under the category of reliability. Content validity, proportions of deaths attributed to ill-defined causes, and improbable age or sex dependency are put under the category of validity. Nonetheless, due to the uniqueness of the South African situation with regards to death registration, this study proposes some modifications to the Rao and colleagues (2005) framework as well as inclusions from the other two frameworks.

For the purpose of this study, criteria have been classified into three categories, namely generalisability, reliability, and content quality. Completeness of death registration for two periods (1996–2001 intercensal and the period within Census 2001 and the 2007 CS) is dealt with under generalisability. A discussion on enumerated population estimates preludes completeness of death registration.

Reliability encompasses comparability of adjusted adult mortality measures with other data and consistency of cause-specific mortality with expected epidemiological experiences. Years of life lost (YLL) are used as a tool to establish consistency of cause-specific mortality with epidemiological expectations for three study periods: 1997 to 2001, 2002 to 2004, and 2005 to 2007. Missing data, proportions of in-hospital registered deaths, and proportions of deaths attributed to ill-defined causes enable the rating of content quality.

2.2. Death Distribution Methods (DDMs)

Two of the death distribution methods were utilised in estimating completeness of death registration for two intercensal periods, namely from

10 October 1996 to 10 October 2001 and from 10 October 2001 to 10 October 2006. This was done to enable the same five-year interval for both periods. The 2007 Community Survey with a reference time of 14 February was moved slightly backward to 10 October 2006 by employing the MOVEPOP spread sheet available in Population Analysis Spread sheets (PAS) provided by the U.S. Census Bureau. Both the GGB and the SEG were employed in estimating completeness of death registration for the aforementioned periods.

Essentially, the GGB method relies on balancing the demographic equation, according to which the growth rate of the population equals the difference between its entry and exit rates. The method, described in detail in Hill (1987), depends on having two census counts from which age-specific intercensal growth rates can be calculated. Assumptions include (1) the population is closed to migration, (2) the completeness of registered deaths is constant across ages, and (3) the completeness of enumeration of the population is constant across ages. In addition, estimates of the completeness of recording between two censuses are provided.

The SEG method, on the other hand, is based on the idea that the number of persons in a particular age group, say 25 to 29, at a particular time *t* will be equal to the total number of deaths to those persons from time *t*, when its members are 25 to 29, until the last member has died. If, therefore, only 50% of the deaths in this age group are registered, then the ratio of the total number of deaths reported to the actual population will be 0.5, the value of completeness of death registration. This method is also explained in detail in Bennett and Horiuchi (1981, 1984).

3. RESULTS

3.1. Issues of Data Quality with Regards to Death Registration Data

About 2% of deaths are registered late (after burial) annually. The effect of late registrations is minimal since numbers of deaths are updated annually even after data for a specific year have been published. This serves also to include additional death notification forms that are registered and not reported to Statistics South Africa in time due to administrative problems and queries about specific forms at the Department of Home Affairs. Since age and sex are important indicators in the analysis of mortality in general, proportions of missing data have an effect on the accuracy of death statistics. About 0.6% and 0.4% of deaths had no response on age and sex, respectively. This suggests fairly good data quality attributable to the use of the unique thirteen-digit national identity number, which provides the date of birth, sex, and citizenship of an individual. However, there are still some people who do not have national identity numbers, especially children who die before their births are registered. Also, mortality measures are not

provided at subnational levels due to high proportions of missing data on usual residence and population group, although these are reflecting a downward trend lately. As a result, these deaths are tabulated by place of death, which may not necessarily be the place of usual residence.

3.2. Population Estimates: 1996 to 2007

The 1996 census was the first census that sought to enumerate all people in South Africa after the 1994 democratic elections. The estimated population after taking into account the undercount of 10% was 40.6 million. The second census was carried out in 2001. The estimated population was 44.8 million after adjusting for a 17.6% undercount (Statistics South Africa, 2003). However, various aspects of age and sex distributions of the 1996 census population estimates remain controversial (Udjo, 2005, p. 320). One reason for these controversies is the implication by the 1996 and 2001 censuses that the proportion of children aged 0 to 4 dropped from 15% in 1970 (which was believed to have enumerated the overall population) to 11% in 1996 and to 10% in 2001.

These controversies had far-reaching consequences for the analysis of proportions of children immunized by the Department of Health in 2003. The latter found that proportions of children immunized were implausibly high—more than 100% even in rural areas, where it was highly unlikely. This was resolved by revising midyear estimates backward using the fertility and mortality rates provided by the 2007 Community Survey. The revised midyear population estimates may have resolved the 0-to-4 age group issue; however, lack of empirical data for both international and internal migration for age and sex adjustments complicate issues.

One of the reasons for the undertaking of the 2007 Community Survey (CS) was to allow for revision of midyear population estimates (Statistics South Africa, 2007b). The reference date of the CS was 14 February relative to 10 October for 1996 and 2001 censuses. Sampling was done at municipal level and data were collected from 25% of total number of enumeration areas. According to the CS data, the population of South Africa was estimated at 48.5 million in February 2007, with the female population constituting 52% (Statistics South Africa, 2007b). Given the slight movement of the 2007 CS enumerated population to 10 October 2006 for the purpose of this study, the resultant population was at 48.4 million.

3.3. Completeness

3.3.1. Intercensal Deaths

At the time of undertaking this study, the total number of registered intercensal deaths from 1 October 1996 to 30 September 2001 was 1,882,522. Male deaths were slightly higher (1,018,260) than female deaths (864,262). The reader should note that these numbers may change over time due to

updating of late-registered deaths or death notification lately reported to Statistics Africa for processing. Intercensal deaths from 1 October 2001 to 30 September 2006 were about 2,818,985, with male deaths higher (1,435,515) than female deaths (1,383,470) as it was in the aforementioned intercensal period. This study focuses on completeness of death registration for adults.

3.3.2. Completeness of Death Registration

The workbook for the application of the GGB method provided by the International Union for the Scientific Study of Population (IUSSP) website was utilised for both intercensal periods. However, the applications of the SEG method utilised a worksheet provided by the World Health Organization (WHO) website. The reader should also take into consideration that the adjusted populations as per the initial application of the GGB method were used as input in the employment of the SEG method for both intercensal periods.

Upon applying both the GGB and the SEG methods, it emerged that death registration completeness increased from the 1996 to 2001 to the 2001 to 2006 intercensal period, confirming the findings of other studies, as discussed in the introductory section. Death registration completeness was estimated at 88% and 86% for the 1996 to 2001 period for the GGB and the SEG, respectively. The fitting of the straight line in Figure 3.1 confirms that there is little migration unaccounted for, as all the points lie close to the straight line, even when international migration was considered to be

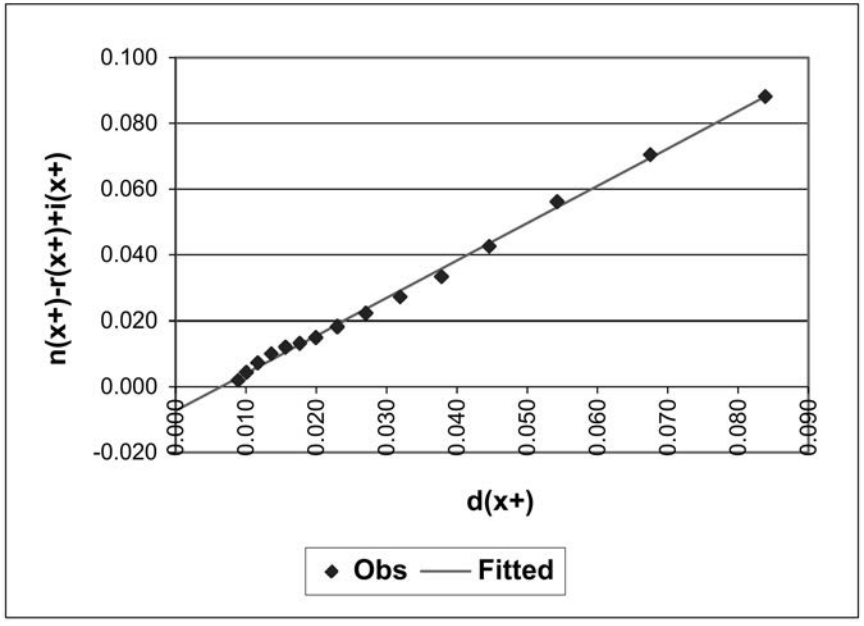

Figure 3.1 Fitting the straight line for the 1996–2001 intercensal period

at zero. Census 1996 was estimated to have been undercounted by about 3.6% by the GGB method, and the adjusted Census 1996 population was used as input into the SEG method.

Figure 3.2 presents the ratios of completeness derived by the SEG method. Differential completeness of death registration between urban and rural areas is reflected by the curvature at older ages. Differential completeness of death registration in the case of South Africa may have been more pronounced in the years of apartheid and subsequently within the democratic era. Despite the slight curvature from age 35 to 60, these ratios do reflect a somewhat flat line at such ages. A median completeness of about 86% is derived, very close to that provided by the GGB method. Averagely, completeness of death registration is estimated at around 87% for the 1996 to 2001 intercensal period by these methods.

In contrast to the results of the GGB application to the 1996 to 2001 data, several points of *b(x+)–r(x+)+i(x+) against d(x+)* do not lie close to the straight line for the 2001 to 2006 period, indicating more unaccounted-for migration as well as input population data problems, as shown in Figure 3.2. The fact that Census 2001 population is set against the 2007 survey population may be the issue at hand here. In addition, movement of the survey population a few months backward to enable a five-year intercensal period may be another source of the problem. That notwithstanding, an estimate of completeness of about 93% is generated by this method.

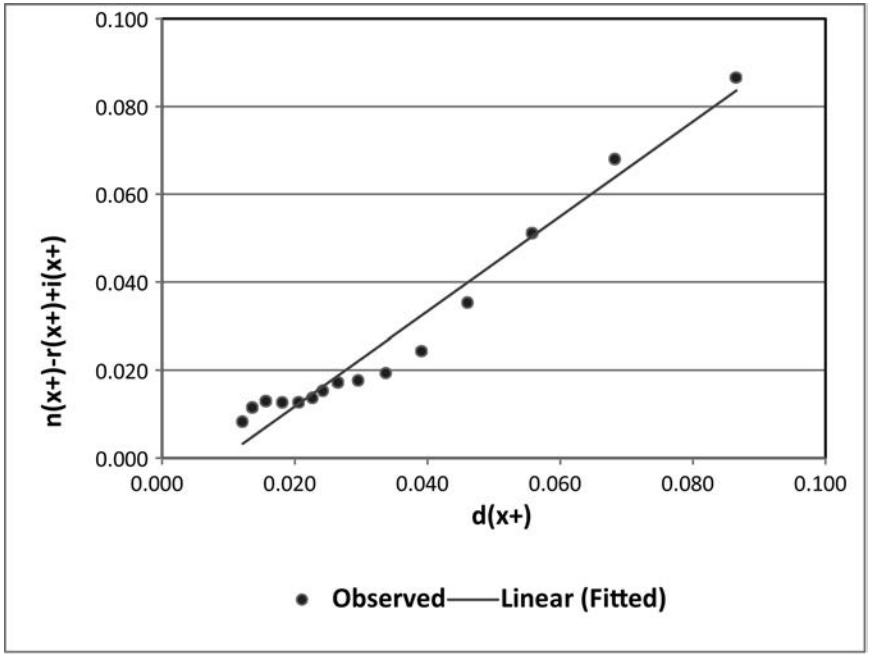

Figure 3.2 Fitting the straight line for the 2001–2006 intercensal period

This estimate is in line with those provided for South Africa in the IUSSP worksheets for the intercensal period 2001 to 2007, even though the intercensal period is slightly different and a different worksheet was used, as mentioned earlier.

Similarly with the GGB estimate for the 2001 to 2006 intercensal period, a median completeness of about 92.5% is generated by the SEG method for the same period when utilising the adjusted 2001 population provided by the GGB method. The ratios provided by this method vary by age, as they indicate a completeness of less than 80% at younger ages, increasing to around 90% at the 25 to 40 range and continuing to increase up to slightly above 100% at the 45 to 55 age range. Differential death registration completeness is also indicated at older ages. Estimates of completeness derived by both these methods for the 2001 to 2006 intercensal period should be treated with some caution, although somewhat in line with expectations.

3.4. Comparability of Adjusted Mortality Rates with Other Data

Procedurally, upon utilising the adjustment factors as per estimates of completeness, the next step would be to compare adjusted mortality estimates with other data. Census 2001 and the 2007 CS may be useful for such a purpose, as these two enumerations occurred closer to the two intercensal periods. Figure 3.3 presents such a comparison with a view to highlighting comparability of levels and trends of mortality over time. Mortality rates adjusted by the GGB and the SEG methods are comparable. The trends of mortality show an increase from the 1996 to 2001 period to the 2001 to 2006 period between ages 15 and 50 years, probably due to HIV/AIDS. Overall, the probability of a 15-year-old dying before reaching age 60 ($_{45}q_{15}$) derived from the adjusted mortality rates (using the general standard) suggests an increase from about 41% during the 1996 to 2001 period to about 51% during the 2001 to 2006 period. These estimates are in line with the 46% provided on the 2012 Rapid Mortality Surveillance Report for 2009 by Bradshaw, Dorrington, and Laubscher (2012, p. i), signifying the downward trend of mortality observable from 2007 onwards.

Although Census 2001 reflects slightly higher mortality rates at younger ages and quite lower mortality rates at older ages than all other data sources, mortality rates at younger adult ages appear to be consistent with those derived from the 1996 to 2001 intercensal period, as expected. Mortality rates derived from the 2007 CS seem to be slightly higher than those from all other data sources from age 5 to age 50, probably due to sampling and non-sampling errors, as it was just a survey. This notwithstanding, these are comparable to the 2001 to 2007 intercensal period, as expected. Next is the examination of consistency of death registration data with epidemiological expectations.

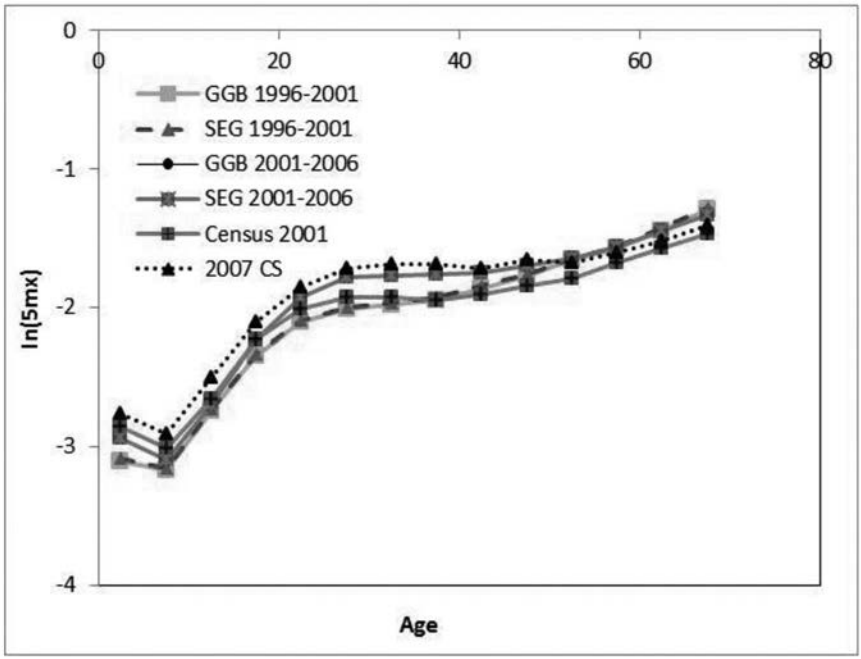

Figure 3.3 A comparison of adjusted mortality rates with other data
Source: South African death registration data

3.5. Consistency of Cause-Specific Mortality with Epidemiological Expectations

An examination of all-cause mortality, as seen in the previous subsection, may be limited in explaining changes in mortality levels. Rather, a focus on causes of death when analysing mortality has the potential to help. That notwithstanding, the quality of classification by cause of death can be easily compromised. Thus, even in the best of statistical environments, cause-of-death statistics have certain fuzziness about them, and it is important to deal with them warily because of that.

In the South African context, classification of deaths by cause is based on the International Classification of Diseases (ICD-10) standard established by the World Health Organization. However, the notion maintained is that some causes of death are misclassified in death registration data (Bah, 2005; Groenewald et al., 2005; Udjo, 2006). Nonetheless, grouped diseases may be preferable to minimize effects of misclassification of causes of death.

For the purpose of this study, years of life lost (YLL) are used as an indicator to assess consistency of cause-specific mortality with epidemiological expectations for the three study periods, 1997 to 2001, 2002 to 2004, and 2005 to 2007. It should be noted, though, that numbers of deaths by cause were not adjusted for incompleteness. YLL take into account the age at

which deaths occur by giving greater weight to deaths at younger ages and lower weight to deaths at older ages. This indicator measures the years of life lost due to a cause as a proportion of the total YLL in the population due to premature mortality.

YLL are calculated from the number of deaths multiplied by a standard life expectancy at the age at which death occurs. The standard life expectancy used for YLL at each age is the same for deaths in all regions of the world. However, uncertainty in estimated YLL may vary from country to country due to uncertainty in overall mortality levels, cause-of-death attribution, and the proportion of deaths coded to ill-defined causes (WHO, 2009: 1).

Infectious and respiratory diseases show a similar age pattern of YLL for both males and females. Increasing numbers of YLL are linked to the reproductive age group and the period 1997 to 2001 to 2002 to 2004, as expected and shown in Table 3.1 and Table 3.2. This suggests that mortality almost doubled for people aged 15 to 49 between these two periods. The increase was also associated with females and more pronounced for infectious diseases. However, the increasing risk of dying due to both diseases seems to have stabilized around 2005 to 2007, like overall general mortality. Of importance is the revelation of the link of the recent mortality decline to both infectious and respiratory diseases.

In contrast, YLL due to neoplasms and circulatory diseases show similar age patterns and trends. While the burden of disease from these two diseases seems to be concentrated at adult ages, the overall total of YLL was somehow stable from 1997 to 2007. There are, however, age variations in YLL over time. In the South African context, chronic diseases are in most cases reported as contributory causes and may as well not be reported even when they are existing.

Table 3.1 YLL due to infectious diseases per 1,000 deaths

	Male			Female		
Age	**1997–2001**	**2002–2004**	**2005–2007**	**1997–2001**	**2002–2004**	**2005–2007**
0–4	24.3	39.9	91.3	23.8	38.5	84.6
5–14	2.8	5.9	7.4	2.7	5.4	7.2
15–29	20.9	34.0	32.3	35.2	68.0	71.2
30–44	90.9	165.8	184.0	62.8	140.3	162.7
45–59	71.7	110.9	129.6	30.7	58.7	77.4
60–69	51.4	60.9	66.0	26.6	34.3	38.0
70–79	53.2	49.2	44.4	31.3	33.6	33.7
80+	64.5	69.4	60.3	50.7	58.9	52.6
Total	**36.3**	**61.9**	**74.2**	**30.9**	**61.5**	**75.0**

Source: South African death registration data

Table 3.2 YLL due to respiratory diseases per 1,000 deaths

	Male			Female		
Age	**1997–2001**	**2002–2004**	**2005–2007**	**1997–2001**	**2002–2004**	**2005–2007**
0–4	9.0	16.7	51.1	8.9	15.4	51.1
5–14	1.6	3.0	3.5	1.7	3.0	3.4
15–29	7.4	13.5	11.8	12.8	29.6	26.8
30–44	31.1	65.6	67.1	25.6	64.3	65.1
45–59	43.5	65.9	73.5	20.8	36.0	41.7
60–69	67.6	80.0	77.4	36.7	42.7	42.9
70–79	104.2	99.2	88.0	58.1	60.4	59.0
80+	172.2	174.3	155.5	130.2	137.2	128.0
Total	**18.2**	**31.1**	**36.2**	**15.7**	**31.7**	**36.0**

Source: South African death registration data

Table 3.3 YLL due to external causes per 1,000 deaths

	Male			Female		
Age	**1997–2001**	**2002–2004**	**2005–2007**	**1997–2001**	**2002–2004**	**2005–2007**
0–4	15.2	13.9	17.9	12.0	11.5	13.9
5–14	9.2	8.7	8.6	5.5	5.3	5.4
15–29	65.1	61.4	61.4	13.9	13.6	13.2
30–44	83.7	75.8	71.9	19.6	17.5	15.9
45–59	51.3	46.8	45.8	14.8	13.6	12.9
60–69	29.5	27.7	25.4	14.1	12.6	11.1
70–79	28.2	22.9	19.2	16.8	14.7	13.1
80+	36.9	35.9	29.9	31.2	30.9	26.0
Total	**45.1**	**42.3**	**42.3**	**13.1**	**12.4**	**12.1**

Source: South African death registration data

YLL due to external causes show a slight decrease between 1997 to 2001 and 2002 to 2004, as shown in Table 3.3. This decrease is linked to males aged 30 to 44. It should be noted, though, that due to a high proportion of deaths due to external causes being classified under "events of undetermined intent," analysis of external cause statistics provided by these data is limited. Overall, the decline in deaths due to external cause is expected given the overall general mortality decline, suggesting reliability of

cause-specific mortality derived from these vital registration data. Overall, the existence of both infectious and cardiovascular diseases noted by Frenk (1989) is confirmed.

3.6. Content Quality

Since there is no yardstick for acceptable proportions of missing cases relative to proportions of ill-defined causes, the extent of omissions is highlighted by place of death. This is so because there may be variation of quality between deaths that occurred in health facilities and those that occurred elsewhere in the case of South Africa.

3.6.1. Missing Data

In-hospital registered deaths (averagely around 45%), relative to deaths that occurred outside hospital, are expected to have lower proportions of missing cases since the ascertainment method is through medical personnel. However, given the layout of the death notification form, there is a need to also compare the extent of omissions between the first and the second pages. Relative to page one of the death notification form, page two is poorly completed due to the confidentiality instruction at the top of the page.

The proportion of missing cases (59.8%) is higher for in-hospital registered deaths relative to deaths that occurred outside hospitals (48.4%). Although this finding is unexpected, the layout of the education variable (with many categories, such as Grade 1 to tertiary education) may be one of the reasons for this high proportion of missing cases. Also, the fact that when certification is done, the informant may not be present to provide such information before the "sealing for confidentiality" is done.

The proportion of missing cases for the population group variable for in-hospital registered deaths is also high (24.2% relative to 20.0%) for deaths that occurred outside hospitals. This may imply reluctance on recording of people's population groups given the country's political past. This reluctance is exacerbated by the fact that the population group variable is not included on the birth registration form.

Variables on page one of the death notification form, identity number, and marital status have relatively lower proportions of missing cases for both in-hospital deaths and deaths that occurred outside hospitals than variables on page two. However, proportions of missing cases for both identity number and marital status are comparatively higher for in-hospital registered deaths than for deaths that occurred outside hospitals. This may suggest poor data collection strategies within health services. As a result, rating on content quality is "unsatisfactory."

3.6.2. Proportions of Ill-Defined Causes

The proportion of ill-defined causes is another criterion for assessing content quality of death notification forms. These are coded according to

Chapter XVIII in the International Classification of diseases (ICD-10). Code R00-R99 is assigned to symptoms, signs, and abnormal clinical and laboratory findings not elsewhere classified (World Health Organization, 1992, Volume 3: 77). About 13% and 11% of total deaths were assigned to ill-defined causes annually for males and females, respectively. Of the total deaths assigned to ill-defined causes, about 82% were for Black Africans relative to less than 2% for Asians. Also, about 11% of all deaths assigned to ill-defined causes were certified in hospitals. Overall, content quality is rated "unsatisfactory" owing to the more than 10% proportion of ill-defined causes for both sexes. This subsection closes the evaluation of content quality of these data.

3.7. Discussion

Estimates of completeness of death registration derived from both death distribution methods used suggest an increase from around 87% in the first intercensal period to around 93% in the second intercensal period. This implies an increase of about 6 percentage points. South Africa deserves to be lauded for this achievement given the slow improvement in vital registration completeness in most African countries amidst all efforts by international organizations. Utilisation of these data for mortality estimation is expected to increase henceforth. These findings suggest a shift from improving numbers of deaths registered towards content quality. In addition, mortality rates derived from enumerated data appeared to be less reliable than those derived from registered deaths data.

Cause-specific mortality at grouped disease level appears to be consistent with epidemiological expectations. While the bipolar protracted epidemiological transition was apparent in YLL estimated for selected important diseases, "the race against time" one where people at younger ages in developing countries are expected to be affected by cardiovascular diseases compared to their developed-countries counterparts was not so apparent. Also, mortality reversal was noticeable up to 2004.

The association between low data quality and in-hospital registered deaths gives cause for concern. What seem to be disturbing are the high proportions of missing cases for in-hospital registered deaths on both page one and two of the death notification forms, implying negligence and procedural problems on the part of health personnel. Also, no improvement in the proportions of deaths attributed to ill-defined causes as well as lack of adherence to the guidelines of death certification renders cause-of-death data not so reliable, specifically at individual disease level. Health intervention programmes are directed efficiently if accurate information at individual disease level is available. Shifting the focus from improving completeness towards content quality is needed. This would reduce proportions of missing data that may enable dissemination of mortality measures by subpopulations.

CONCLUSION

Significant improvement in the registration of deaths in recent years emphasized by the Department of Home Affairs as its legislative mandate demands has been confirmed. Usability of death registration data for mortality estimation is implied by fairly high completeness levels, despite the somewhat erratic ratios shown for the intercensal period that combines a census and a survey. There is a need, therefore, to substitute the 2007 CS with census 2011 population data upon release of the census results in order to verify these completeness estimates.

The limitation of utilising these data for mortality estimation at subpopulation levels suggests low content quality. Efforts directed at improving death registration completeness should be redirected towards content quality. The association between low content quality and in-hospital registered deaths gives cause for concern since it implies negligence on the part of health personnel, even though it may also be linked to the recent exodus of health personnel.

The existence of the bipolar protracted epidemiological transition was confirmed. Also, mortality reversal in the 1990s due to HIV/AIDS was apparent up to 2004. A somewhat tapering off of mortality was apparent from 2005. The recent mortality decline is associated with both respiratory and infectious diseases. In contrast, the "race against time" epidemiological transition is yet to be observed.

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4 An Assessment of Quality of Birth Registration in South Africa for Fertility Estimation

Mosidi Nhlapo

1. INTRODUCTION

A large body of literature exists in South Africa on levels and trends of fertility. However, most of these studies employ indirect demographic techniques to derive estimates of fertility from census and household survey data (Sibanda and Tukufu, 1999; Stats SA, 2010; Udjo, 2005). This is mainly due to the perceived poor state of vital registration data. Although there is general agreement about fertility trends in the country, there remain conflicting views about levels of fertilty (Moultrie and Dorrington, 2004; Moultrie and Timaeus, 2003; Udjo, 2005). The indirect estimation methodologies used to derive fertility rates from data collected in censuses and surveys require adjustment to the data, resulting in conflicting estimates of fertility. A reliable birth registration system should resolve some of the inconsistencies in fertility estimation, as it requires no adjustment.

In South Africa, registering a birth serves an added purpose: it is required for children to access the government's social security and other poverty-alleviation benefits. South Africa has put great effort towards encouraging timeous registration of births (Hill, 2009). Consequently, current birth registration (i.e. births that are registered in the same year they occur) has improved steadily between 1998 and the present. In 2005, the level of completeness for birth registration was estimated at 72%, with registration levels higher in urban provinces such as Gauteng and Western Cape (Stats SA, 2007a). Predominantly rural provinces like the Eastern Cape and Limpopo still have much lower completeness estimates than other provinces (Stats SA, 2007a). This study uses the South African Department of Home Affairs birth registration data to assess the possibility of estimating fertility. First, the chapter looks at issues of data quality, including trends in current and late registrations and missing data. Estimates of completeness of birth registration are also provided. Last, comparative estimates of fertility schedules derived from the register and enumerated data are presented.

1.1. Birth Registration in South Africa

The history of civil registration in South Africa dates back to the 1700s with the registration of marriages, subsequent to which births and deaths were registered. This occurred within the political history of the country, which was largely racially based (Stats SA, 2009). The National Population Register was implemented in 1972 for the White, Coloured, and Indian population groups, with Africans only included from 1986. The Population Registration Repeal Act was passed in 1992 to abolish the distinction made between population groups (Bah, 1999). Currently, birth and death registration in South Africa is governed by the Births and Deaths Registration Act, 1992 (Act No. 51 of 1992) as amended in 1997 (Act No. 67 of 1997) and again in 1998 (Act No. 67 of 1997).

A live birth must be registered within 30 days after occurrence with the Department of Home Affairs (DHA) on the prescribed birth notification form. Once registration occurs outside this prescribed period, it is deemed late by the department, and reason for the tardiness must be provided at registration (Births and Deaths Registration Act of 1992: Act No. 51, as amended) Depending on citizenship status, an abridged certificate or a handwritten certificate is issued on registration. The act also stipulates that in cases in which a child is born alive but dies before the birth is registered, the birth is not registered posthumously (Stats SA, 2009).

The Department of Home Affairs (DHA) still faces a number of challenges, including a large number of people left out of the mainstream of citizenship due to historical reasons while others had their details entered wrongly. Most pressingly, the DHA is faced with the challenge of syndicates targeting its system to acquire certain entitlements (Stats SA, 2009). Efforts are currently being made to close the loopholes.

2. DATA SOURCES AND METHODOLOGY

This analysis is based on data from the Department of Home Affairs on registered births from 1998 to 2008, Censuses 1996 and 2001, and Community Survey (CS) 2007. The Community Survey is a large national survey which covered 246,618 households. The survey included questions on births in the last twelve months and lifetime fertility for women aged 12 to 50 years.

Stats SA uploads birth data from the Population Register on a monthly basis, from which a report on births is compiled and published annually. The disadvantage of this method of obtaining data for Stats SA is that only limited variables are made available. The section on data quality deals extensively with this issue. Two censuses have been conducted in post-apartheid South Africa, namely Census 1996 and 2001. South Africa has recently moved its intercensal period from five years to a decennial census.

This necessitated Stats SA to undertake a large household survey in 2007 (Community Survey) in an effort to bridge the gap created by these changes. The third census was conducted in 2011, though this does not form part of this report.

As is the case in most countries, the census tends to miss some segments of the population. In South Africa this is also the case. According to the Post Enumeration Survey (PES), the 1996 census underenumerated the population by 10%, and this increased to 17% in 2001. Various researchers have documented other deficiencies of the three datasets (Moultrie and Dorrington, 2004; Stats SA, 2010; Udjo, 2003). Among them is the continued inability to capture correctly the population age-sex structure. Moultrie and Dorrington (2004) noted some of the defects in the 2001 census fertility data, most of which were introduced during editing and data processing. Only minimal editing was done on the Community Survey 2007. Nonetheless, these datasets still provide comprehensive demographic data which give insight into the various aspects of South African demography.

2.1. Methods for Estimating Completeness

Several methods of evaluating completeness of birth registration have been proposed and used. The main distinction between the various methods is input data requirement. One of the proposed methods is to compare the birth register with other data sources, such as the immunisation information from the Department of Health, or with school enrolment data (see Anderson and Silver, 1986). This method assumes that all children are immunised timeously and/or registered at their school-going age (seven years). For instance, if enrolment in 2005 is equal to the number registered for those births that occurred in 1998, taking into account the late registrations in subsequent years, it will imply that the birth register for 1998 is complete (Anderson and Silver, 1986; Stats SA, 2007a). This method is ineffective in a country like South Africa, where children are allowed to enter school after the stipulated age. Chandra-Sekar and Deming (1949) developed another method known as the catch-recatch method. This method essentially matches records from the register and those in the census. However, this method also works better in countries with complete registration of vital events and is used mainly to verify the census and or survey results.

Hill (2009) proposed a method based on Brass (1964) P/F ratio method to assess the completeness of birth registration when fertility has been declining, as is the case in South Africa. This method proposes the use of the synthetic cohort P/F method as proposed by Zlotnik and Hill (1981) in the absence of constancy. The method is applicable if data on children ever born are available for two points. Using data from Census 2001 and Community Survey 2007, Hill estimated completeness level of 84 %. In this chapter, this method is adopted to estimate completeness for the 2001 to

2007 periods. However, since birth registration data are only available from 1998, estimates of completeness for the 1996 to 2001 period could not be computed. The average age-specific fertility rate (ASFR) of the two points is derived from birth register data corresponding to the two points, while children-ever-born data are obtained from Census 2001 and CS 2007 data. The average P/F ratios for the age groups 25 to 29 and 30 to 34 are used to estimate the completeness of registration (Hill, 2009).

Additionally, two sets of estimates of completeness of birth registration are computed. The first estimates are based on official Statistics South Africa (Stats SA) birth estimates for the years 1998 to 2008. These estimates are derived using the Spectrum model. The model uses the input assumptions on fertility, mortality, and migration to derive the best estimates of the population size (see Stats SA, 2007b). The second comparative estimates of completeness are based on enumerated data; however, these estimates are only for 2001 and 2006, corresponding to the Census 2001 and the CS. The most important assumption for this method is that the census is complete and that any deficiency within the data is not systematic (Zlotnik and Hill, 1981).

Since the aim of this chapter is to assess the reliability of the birth register data, three approaches are adopted to estimate completeness of birth registration. In an attempt to see which dataset provides a plausible completeness level, three variations of registered data are used. The first is data updated for late registration using all late registrations for each birth year from 1998 to 2009 regardless of the time lag between occurrence and registration. The second is data updated using only those births registered within the first five years of occurrence/birth (this data is referred to as updated data in the rest of the chapter). The third is data on only births registered within occurrence year, that is births registered within the year they occurred (in the rest of the chapter, this is referred to as current registration birth data).

This study does not attempt to compute fertility schedules from the aforementioned enumerated data but relies on published data. The estimates of total fertility rates (TFR) for enumerated data are obtained mainly from published data by various researchers. Published estimates of TFR used in this comparison are obtained from Udjo (2003), who estimated TFR of 3.2 based on the 1996 census. The estimate for 2001 of 2.9 was obtained from the extensive analysis done by Moultrie and Dorrington (2004) based on the 2001 census. Stats SA (2010) estimated 2.8 for 2006 using Community Survey (2007) data. Three fertility schedules are computed from the vital register data, namely the TRF, ASFR, and cumulative ASFR. Data used in these computations are adjusted for missing data and for births occurring to women outside the 12 to 49 age range; these are then prorated across the seven age groups based on the observed age pattern of fertility. These data were then adjusted using an adjustment factor obtained after computing completeness of birth registration for each year.

2.2. Issues of Data Quality

A vital registration system not only provides the most reliable data source but also offers the strongest basis for firmly establishing sex ratios at birth in human populations (Udjo, 2003). Outside of the demographic estimation function, the data from the vital registration system also provide important statistical data for planning and administration (United Nations, 1998). In countries with complete registration systems, the vital register is used to verify data collected through the censuses and household surveys. South Africa is yet to reach a point where this is the case. This section will focus on the quality of birth register data, including the content of the birth notification form.

The new birth notification form, BI-24, was introduced in 1998 by the Department of Home Affairs in an effort to improve registration of births. The form consists of two parts. Part 1 collects information on the child, the parents, and the informant. Information on the child includes the date of birth, sex of the child, and place of birth. Parental information includes their date of birth, place of birth, and citizenship. The marital status of the parents is also collected. Part 2 collects information on the socioeconomic characteristics of the parents, including the population group, educational attainment, and employment status. Included in Part 2 is the mother's other demographic information, the mother's health status during pregnancy, status of the birth at the time of delivery, and other medical and health information. Stats SA receives some information from Part 1 of the notification form and none from Part 2. In addition, there are some variables that are either not captured on the population register or not forwarded to Stats SA, even though they may be recorded on the birth notification form. These include the marital status of parents. Even though population group classification was removed through legislation from the birth registration system, this information can still be derived as a proxy for the child on Part 2 of the BI-24 form based on the population group of the mother. The nonavailability of the race variable is a shortcoming for the data, as South Africa is a racially diverse country, and most importantly it is well known that fertility varies by population group (Udjo, 2005). Secondly, official population estimates in South Africa are done separately for each of the four population groups. Researchers require robust estimates of births to obtain fertility assumptions for each population group.

The form also does not ask for province of birth of the child or province of usual residence, though the dataset has a variable called "province." Instead, it asks the place of birth of the mother. The department might have other means of deriving the variable. It is not clear if this is the province of usual residence, which is ideal, or if the variable captures province of registration. In a country like South Africa with a highly mobile population, a place of birth might not necessarily be the same as the place of usual residence. Educational qualification and employment status of parents are

also not included in the dataset, though the information is collected in the birth notification form.

The age at which a birth is registered has administrative implications. Three types of forms are used for registering a birth, depending on the status of registration. If registration occurs within the year of birth, the BI-24 is filled out. For individuals older than 1 but younger than 15 at registration, the BI-24/1 is filled out. For those 15 years or older, the BI-24/15 is required. This fact brings the possibility of inclusion of those births registered using the latter forms into the data; these are births which could have occurred any time from two to fifteen years prior to registration. This section looks at some aspects of birth registration data quality and their likely impact.

2.3. Late Registration

The data from the vital register show some births that are registered outside occurrence. The total number of birth registrations for each year consists of both current registrations and late registrations (births registered in later years). The number of births registered within occurrence year has been increasing steadily from 273,180 in 1998 to 915,674 in 2008. For the first time, in 2005, the number of current registrations was higher than the number of late registrations. This trend has continued in subsequent years. This change might be due to increasing uptake of government social grants (a birth certificate is a requirement for applying for a government child-support grant). There was a slight reversal of the downward trend in late registration in 1999 and 2003. Stats SA (2009) attributes the slight increases in late registrations in 1999 to the demand for identity documents for those eligible for voting during the April 1999 national and provincial elections. (Department of Home Affairs had a campaign around this time to register people without IDs. A birth certificate is a requirement for applying for an identity document.) The increase in 2003 might also be attributable to the 2004 elections. For all the years, women aged 50 years and above had the highest number of births registered late, with 2001 showing the highest number (15,993) of births. Concerns around the continued existence of late birth registrations are that the longer the time lag between occurrence and the registration date, the larger the negative implications for quality.

To get a clearer picture of the trends in registration over time, Table 4.1 shows the proportion of births registered late by year of registration and the year to which these births relate. The proportion of births registered one year after occurrence has been declining. In 1999, about 35 % of births registered in that year occurred a year earlier. By 2008, this proportion had declined to only 10%. Table 4.1 also shows that the proportion of late registrations is largest in the first year following occurrence for all the years and declines in subsequent years. For example, for those births that occurred

Table 4.1 The proportion of late registrations by year 1999 to 2009

	Registration Year										
Birth Year	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
1998	**34.8**	21.5	15.3	11.2	8.9	5.0	2.7	2.3	1.1	0.8	0.5
1999		**34.1**	18.2	11.2	8.9	5.0	2.7	2.3	1.1	0.8	0.5
2000			**32.0**	15.4	9.8	5.2	2.9	3.0	1.6	0.9	0.6
2001				**30.2**	12.1	5.8	2.8	2.7	1.7	1.0	0.6
2002					**25.8**	7.8	3.3	3.0	1.9	1.3	0.7
2003						**21.0**	5.2	4.0	2.3	1.6	0.9
2004							**17.1**	5.9	2.8	1.8	1.2
2005								**16.3**	4.3	2.3	1.4
2006									**12.8**	3.9	1.9
2007										**13.0**	3.1
2008											**10.0**

in 1998, less than 1% are registered in the eleventh year (2009). In all the years analysed except for 2008, a substantial number of foreign births related to births that occurred about thirty to forty years ago (analysis not in this chapter). These are registered births that occur outside the country for which at least one of the parents was a South African citizen at the time of the child's birth (Stats SA, 2009).

2.4. Missing Data and Parental Age

Missing data is a common occurrence in demographic data. Proper handling of missing values is critical in most analyses, as gaps have potential to bias results. The data used in this analysis were not accompanied by related metadata. In the absence of this information, the interpretation of the coding was left to the author. For instance, the zeroes in the parental age variable were interpreted as missing values. Figure 4.1 shows the percentage of missing values for the "age of father" variable. The age of the father is one of the most poorly captured variables in birth data. About 42% of the births registered in 1998 did not contain information on age of the father. This figure rose to 65% in 2008. This might be attributed to the informant more likely being the mother of the child than the father (Stats SA, 2007a). The second issue is that information collected in the notification form about the father depends on acknowledgement of paternity by the father in the case of those births that occur out of wedlock (Stats SA, 2007a). Paget and

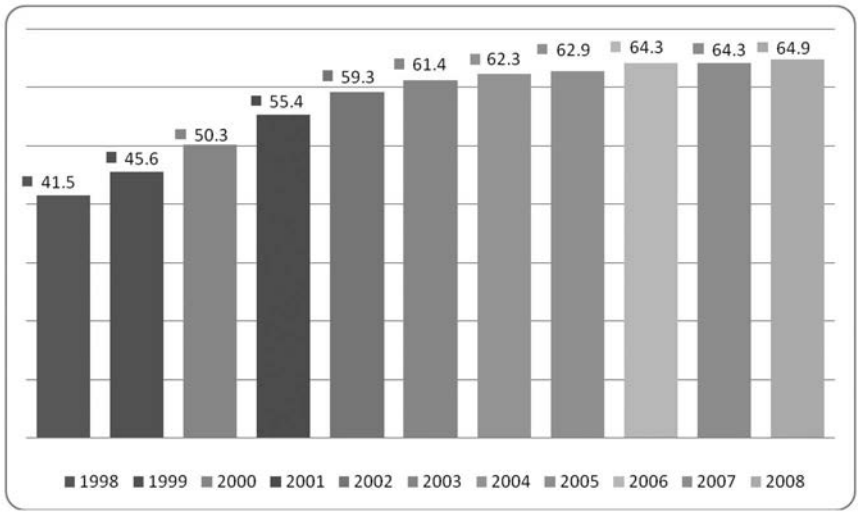

Figure 4.1 Percentage missing for age of the father

Timaeus (1994) noted that this might be an indication of high proportions of illegitimate births. The unavailability of the marital status variable in the dataset makes it impossible to confirm this case.

The "age of mother" variable has fewer missing values, with less than 1% missing data for all the years. This is with the exception of 2002; the data in 2002 do not have any births to women outside the 12 to 49 age range values, as is the case with other years, so it seems all the values falling out of the 12 to 49 age range were included under the 0 code.

Age of the mother is a critical variable in demographic analysis. In fertility analysis, maternal age has implications for the interpretation of trends and level of fertility. The data show a number of births that occur to women outside the reproductive ages of 12 to 49. This is notwithstanding the fact that births do occur to women above the age of 50. The number of births to older women might be attributable to the requirement on the registration forms that the person registering the birth has to be a parent or *any* other informant.

Data on the number of births to women outside the 12 to 49 age range are presented in Table 4.2. The data show occurrence of births to children aged 1 to 11 as well as some births to women aged 50 years and above. The number of births occurring to children aged 1 to 11 years is almost steady over time, showing no clear trends. The number of births to women above 50 years has been declining after reaching a peak in 2001, when it was 4,275 in 2008. It is highly likely that birth occurrences to children aged 1 to 11 years might be the result of capturing errors at DHA.

Table 4.2 The number of births registered to children aged 1–11 and to women aged 50+

	Years and number registered										
Mother Age	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
1–11 years	648	823	786	1093	0	1190	1341	1134	1048	926	855
50+ years	7541	7799	17697	24024	9314	12403	6,506	4715	4824	3003	4275

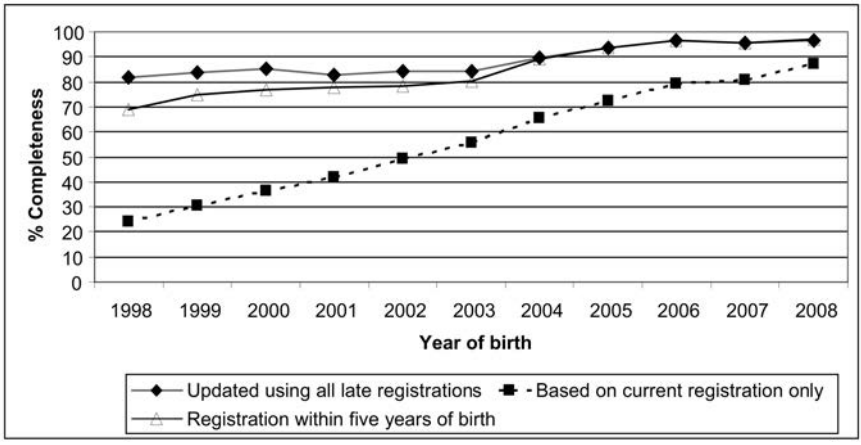

Figure 4.2 Comparative estimates of completeness level for birth registration, 1998–2008

2.5. Estimating Birth Register Completeness

2.5.1. Completeness Based on Midyear Estimates

Completeness of registration is one of the critical components of data quality assessment. Figure 4.2 compares completeness estimates obtained using the three different variants of birth registration data, where the denominator is Stats SA official birth estimates. Births registered within five years of birth could only be obtained till 2004; after this period, the first two methods yield the same estimates of completeness. Data adjusted using all late registrations show that completeness increases from 77% in 1998 to an estimated 96% in 2008. These estimates, however, appear improbably high and bring into question the effects of updated data, given that the dataset is adjusted for late registration regardless of how far off registration occurs from the birth year. Completeness derived using updated data is slightly lower than the latter estimate, though it can be seen that by 2004, the estimates are the same.

Using current birth registrations increases completeness levels from a low of 24% in 1998 to 87% in 2008. These estimates seem more plausible than is the case when adjusted data are used. The trend over time is clearer and appears more reasonable than the estimates derived from the other two methods. It is significant that by 2008, the completeness estimates from the two approaches are moving closer to each other. This is attributable to improvements in the number of births that are registered within occurrence year.

2.5.2. Completeness Based on Enumerated Data

The second approach is based on enumerated data. Figure 4.3 shows that the trend line is based on current registration, and similar to the previous section, the computation is based on Stats SA estimates. The blue squares represent 2001 census and 2006 based on CS, using only current registration data. The triangular points are based on updated data. (The 2006 point only represents data updated for births that were registered between 2006 and 2009, i.e. three years after occurrence.) The circle point in 2006 is based on the Hill method. The trend line was included to show the similarity with the estimates derived from enumerated data when only current registration is used. As indicated in the previous section, completeness estimates obtained from using only current registration data offer the most plausible estimates of the three variant methods used. Completeness levels were around 24% in 2001. If these data were used to adjust 2001 census data, then larger adjustment factors than in 2007 were used. Larger adjustment factors are usually associated with higher uncertainty levels.

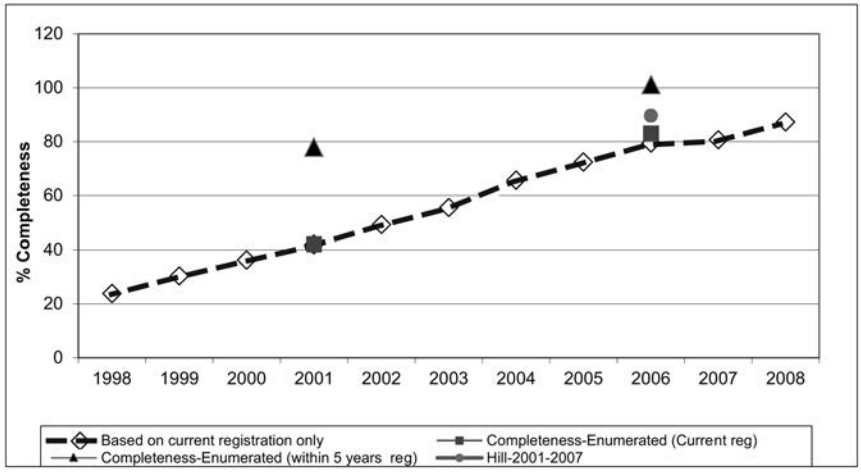

Figure 4.3 Comparative estimates of completeness level based on enumerated data, 2001 and 2007

The Hill method gives an estimated completeness of 89.6%, given the level of late registration alluded to earlier and the fact that birth data are updated continually as new registrations occur. This figure should be a reasonable reflection of the completeness level in the period. However, having a second point will provide more confidence in this estimate. This will only be possible once the data from the 2011 population census on fertility are available. Thus, for the purposes of analysis, only current registration data and updated data are used in the rest of the chapter, but more emphasis is placed on computations based on current registration. Current registration methods provide an estimated completeness level of 79.4%, while enumerated data provides an estimate of 83.1%.

When completeness is estimated using adjusted data, the estimates are higher than those based on current registrations for both 2001 and 2006. The actual number of births reported in the CS was higher than the number obtained when adjusted data are used to estimate completeness. In the case of 2006, it was data within three years of births. This approach thus yields completeness levels above 100% in 2006. This shows the hazards of using information from a survey to estimate completeness, as the coverage is not the same as in the census. Thus the interpretation of this result needs caution.

Further analysis of late registration data was done by cumulating births from late registrations for each year after birth year over time. Completeness levels were then computed for each year from additional registrations. Results show that the contribution of late registration for first year after birth to completeness levels has also been improving over time. In 1998, registrations occurring one year after birth (in this case in 1999) improved completeness levels of the 1998 births by just 37%. By 2006, adding one

Table 4.3 Percentage contribution of late registration to completeness levels for each year of registration

	Year One	**Year two**	**Year three**	**Year four**	**Year five**	**Year six**	**Year seven**	**Year eight**	**Year ten**
1998	10.0	8.0	8.0	6.0	4.0	2.0	2.0	1.0	1.0
1999	10.0	9.0	6.0	4.0	2.0	2.0	1.0	1.0	
2000	11.0	7.0	3.0	3.0	2.0	1.0	1.0		
2001	8.0	5.0	2.0	2.0	1.0	1.0			
2002	6.0	2.0	3.0	1.0	1.0				
2003	4.0	3.0	2.0	1.0					
2004	5.0	3.0	1.0						
2005	4.0	3.0							
2006	4.0								

year of late registration results in completeness levels of 91%. However, it is also important to note that by 2006, current registrations were above 80% complete.

3. ESTIMATING FERTILITY RATES

Fertility data in censuses and surveys are derived from the few questions asked of women aged between 12 and 50 years at the time of enumeration, from which estimates of levels and patterns of fertility are computed. This is indicated by total fertility rate (TFR) and age-specific fertility rate (ASFR). This section looks at comparative estimates of fertility derived from the birth register and enumeration. It also compares the indices derived from current registration data and updated data.

Data used in this analysis were explained in the methodology section. Other authors provided differing estimates. This might be due to differences in the methods used and the underlying assumption of such methods. For instance, Moultrie and Timaeus (2002) gave an estimate of 3.2 derived from both the Demographic and Health Survey (DHS) from their own recalculations and Census 1996, while the DHS had an estimate of 2.8 for around the same time.

This section uses current and updated data to derive estimates of TFR and ASFR. Since birth register data start from 1998, estimates of TFR for 1996 only relate to Census 1996. Figure 4.4 compares estimates of TFR trend computed from the register based on data from 1998 to 2006. The three points indicate estimates derived from enumeration. Estimates of TFR based on current registrations and updated data were the same; therefore

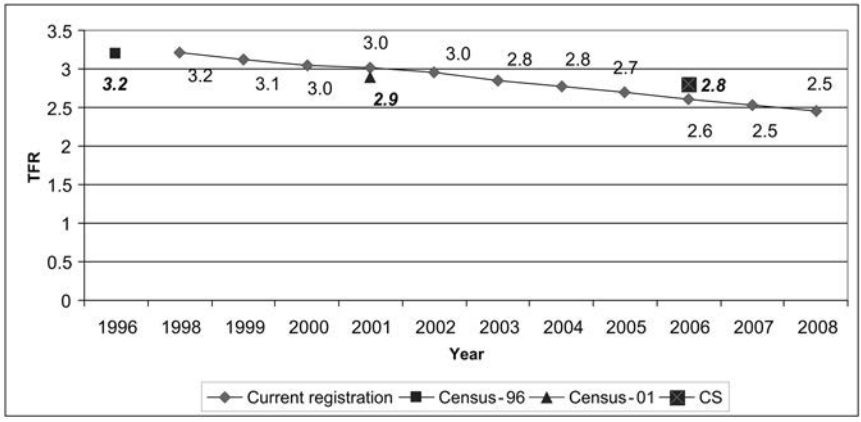

Figure 4.4 Comparison of total fertility rates estimated from current registration and enumerated 1996, 1998, 2001, and 2007 (CS)

only one of them is shown. Estimates from enumeration show a downward trend from 3.2 obtained in Census 1996 to an estimate of 2.8 in 2006 based on CS data. Observed trends from the register data are in line with literature on fertility trends in South Africa (Moultrie and Dorrington 2004; Stats SA, 2010). However, the levels for almost all the years are slightly different from those observed from enumerated data.

The register estimated 3.2 in 1998, which is similar to the Census 1996 estimate. The 2001 census estimate is the closest of the three periods, when the register estimated TFR of 3 and the census had an estimate of 2.9. Given the observation from the previous section about the high uncertainty around the adjustment factors in earlier years, it is highly likely that for 1998 and 2001, the reliability of estimates from the register are questionable.

While TFR gives a picture of the level of fertility at a particular point (year), ASFR provides the age pattern or shape of the fertility in a population as well as indications of current fertility.

In 2001, for both updated and current data, fertility peaks at ages 30 to 34, while census data indicate a peak at ages 25 to 29. Both the ASFRs based on updated data and current data show that in 2001, births to women age below 29 and 25 years, respectively, were grossly under-registered. Above age 29 for updated data and 25 years for current data, the schedule from the register reflects more births than does the census.

Though it is quite unclear what the main cause of the observed discrepancies could be, the problem could also be due to age misreporting, which is widely documented in census data (results not shown).

Both datasets used indicate that fertility peaks at ages 20 to 24, while the community survey indicates a peak at ages 25 to 29, in line with the census.

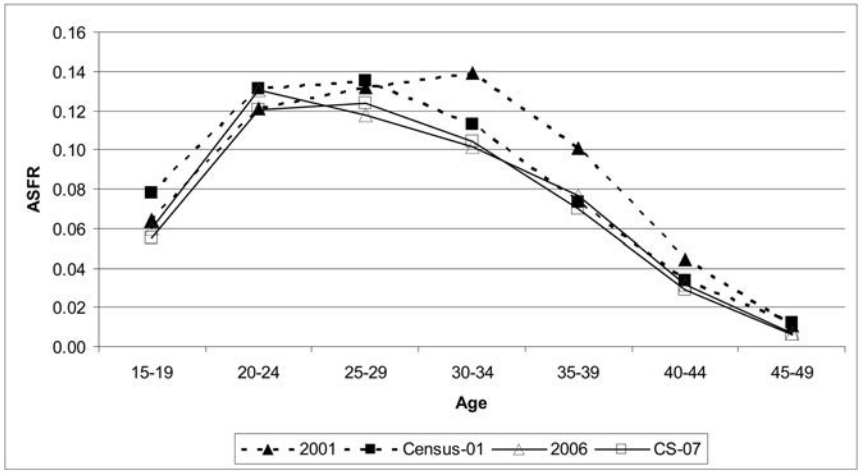

Figure 4.5 Age-specific fertility rates from updated registration data and enumerated data

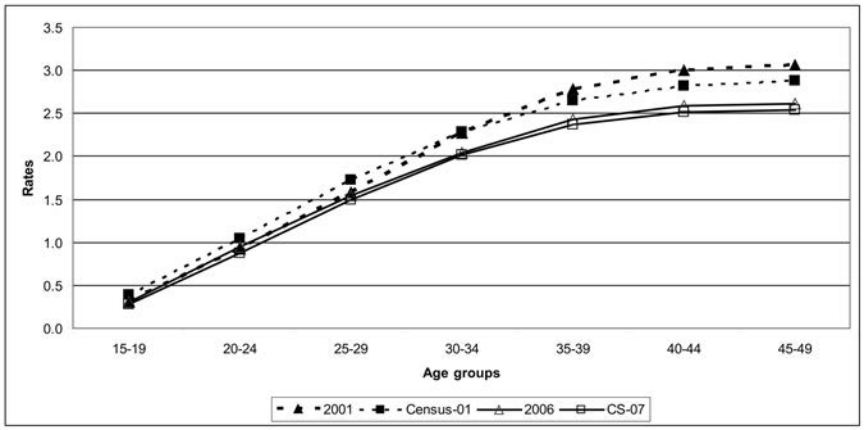

Figure 4.6 Cumulated age-specific fertility rates from updated registration data and enumerated data

Quite importantly, by 2006, the under-registration observed in 2001 at ages below the peak had declined substantially, and discrepancies observed in ages above the peak had also reduced somewhat. Although there are some slight variations between the estimates produced from the two data sources, the patterns and level by age are much closer in 2006 than was the case in 2001. The pattern is also much smoother in 2006 than was the case in 2001. However, the age pattern of fertility derived from the register still departs slightly from the typical South African fertility pattern. It is equally possible that the observed difference in age patterns might be attributed to age misreporting in e ither the register or from enumeration, a point which requires further research. Next, we look at cumulative fertility patterns.

Cumulated ASFR provides an estimate of the average number of children ever borne by women who have reached the end of each age group. Alternatively, it gives a picture of the history of current fertility in a population. The schedule is also used in the computation of parity data. Cumulated ASFR shown in Figure 4.6 is based on a comparison of updated data and enumerated data. Cumulated estimates in 2001 from the register show the under-registration alluded to earlier. The 2006 pattern seems closer to the pattern from CS, showing favourable comparison at all ages. At older ages, both sources show some evidence of fertility decline between the two periods.

Figure 4.7 shows the comparison based on current registration data. Updating the 2001 register data improves comparisons between Census 2001 fertility schedule and the register. The under-registration seen with updated data at younger ages is more pronounced where only current data are used, as seen from Figure 4.7. The shapes of the two schedules are much closer in 2006, indicative of improvements in current registration.

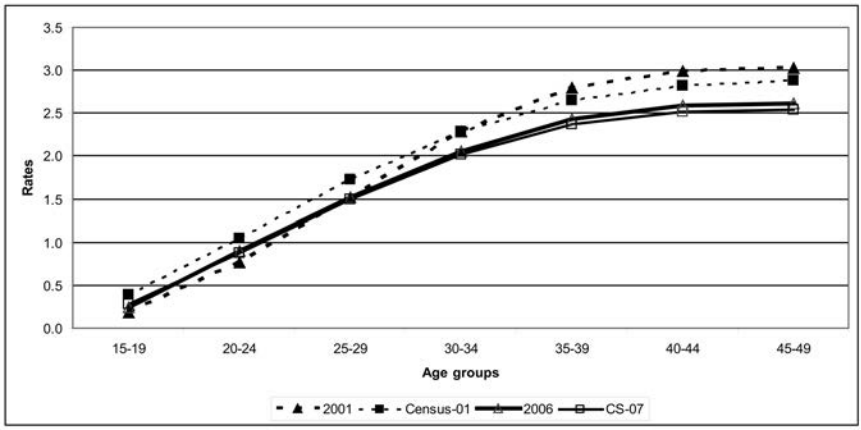

Figure 4.7 Cumulated age-specific fertility rates from current registration data and enumerated data

4. DISCUSSION AND CONCLUSIONS

The results of this study suggest improvements in some aspects of birth registration data in South Africa over time. However, there remain a number of challenges, mainly related to quality. Three major types of errors have been identified in this analysis. First is the continued presence of late birth registrations. The second major error is the number of missing data that is associated with age. The age of the father has the highest percentage of missing cases of the two parental age variables. Last is the incorrect reporting of parental age, particularly the mother's age, which is an important variable used in the computation of most demographic indices. Most indirect estimation techniques make assumptions about the distribution of missing data or the general accuracy of the age data. If incorrect reporting is restricted to certain age groups, the reallocation method adopted in this study might result in bias in the results obtained.

Two things might explain the persistent presence of births occurring to women outside the 12 to 49 age range. One is that this might be the result of data capturing errors at DHA. Alternatively, this might be the incorrect capturing of informants as mother at registration (this is mainly in regard to women above 50 years of age). In cases where parental information is unavailable, the DHA might use any other information available on the form, which in this case can even be information from the informant in the place of parental information. It is also unclear at which stage of the registration process some of the noted deficiencies are introduced in the data. This could be either during data collection stages or at processing stages. The magnitude and impact of all these weaknesses is unclear and attracts

reservations about the reliability of birth registration data to determine conclusively the pattern of fertility in the country.

While both TFR and ASFR give indication of trends and patterns of fertility in a country, these schedules do not say much beyond this. There is general recognition in South Africa that there is unlikely to be any reversal of the observed fertility declines. In this case socioeconomic indicators become crucial in any analysis of fertility to measure development progress and inform policy. In addition, due to historical reasons, it can be expected that registration completeness levels might vary by population group, with White, Asian, and Coloured population groups likely to show higher completeness levels than Africans. Of greater importance is that enumerated data have shown that fertility varies by population group in South Africa and that some population groups already have fertility below replacement level. The absence of some key indicator variables such as the critical race variable, education, and marital status remains a concern. It limits the determination of trends and patterns and fails to provide information on the main drivers of observed trends and patterns.

The various approaches used in this study to estimate completeness levels indicate that completeness levels in 2006 were above 80%. Additionally, using current registrations yields the most plausible estimates of completeness. Estimating completeness levels using updated data produces improbably high estimates of completeness, particularly in later years. The analysis also revealed that the further away from occurrence registration occurs, the smaller the contribution of those additional births to completeness levels. The contribution of births registered one year after occurrence (1998) to completeness levels declines from 10% in year one (1999) to around 1% in year nine. In addition, the contribution of late registrations happening one year after birth to completeness has been declining over time. In 2006, the estimated contribution to completeness was just 4% one year after birth. In the next few years, late registration data are likely not to add any value to completeness level of the birth register.

Fertility schedules derived from completeness adjusted data compare favourably with enumerated data, but large adjustment factors in earlier years attract some uncertainty about fertility estimates derived from the register in earlier years. Both updated and current registration data yield the same estimate of 2.6 in 2006.

Comparisons of age pattern of fertility from the two data sources in 2006 indicate that after adjustment for completeness, the register data could be used to provide reasonable evaluation of patterns of fertility derived from enumerated data in the near future. However, ASFR for 2001 provides indications of under-registration of births at younger ages and possibly age misreporting. It should be noted that age misreporting can produce systematic biases in estimates of ASFR and the TFR. It is thus unclear what the effect of the method adopted in this study for adjusting for out of the 12 to 49 range ages of mother has on the fertility schedules obtained.

Given the observed effect of inclusion of unrestricted late registrations on completeness levels, this study recommends the use of only current registration data as an indicator of completeness to reduce the effect of bias introduced by late registration data.

The non-availability of the second part of the BI-24 registration form is a shortcoming. This part of the form contains, among others, information on all births that occur at health facilities and the status of life of each baby at delivery stage. Though this information might not answer all questions related to the birth register problem, as there are some births that occur outside health institutions, it would attempt to address some of the associated questions raised in the analysis. The understanding is that this part of the form remains with the Department of Health, while the first part is the domain of the Department of Home Affairs. Equally, the absence of metadata for the birth data affects confidence about the coding used and how these codes were interpreted in this study.

The presence of births registered using both the BI-24/1 and the BI-24/15 in the population register is a possibility and might influence data quality. The second area of concern is the method of extracting birth data from the population register. It is impossible to be completely confident about the validity of the data content, as the population register captures other information than just births. Lack of control for Stats SA over processing of birth data makes it difficult to recommend any remedies to some of the quality concerns raised by the study.

The findings in this study also signal that challenges facing DHA have shifted from coverage to data quality. Collaboration is needed among the Departments of Health, Home Affairs, and Statistics South Africa to improve the quality of birth data. This collaboration proved successful in improving quality of death registration statistics.

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5 An Assessment of the Quality of Aggregate Employment Statistics in Population Censuses and Survey in South Africa

Joyce Lestrade-Jefferis

1. INTRODUCTION

The collection of labour market information in South Africa changed radically with the advent of democracy in the 1990s. Statistics South Africa (Stats SA), then known as the Central Statistical Service, embarked on a strategy to meet the new statistical needs of the nation. This included the introduction of the annual October Household Survey (OHS) covering all areas of the country and incorporating a detailed labour market component. Prior to this, Stats SA's labour market statistics were for decades the subject of contention and ridicule, as discussed by MERG (1993), Simkins (1994), and Standing, Sender, and Weeks (1996). The postapartheid population censuses conducted in 1996 and 2001 also included all areas of the country,[1] as did the Community Survey (CS) of 2007.

Against this background, the main objective of this chapter is to obtain comparable aggregate employment data from Census 1996, Census 2001, and the Community Survey of 2007 at subprovincial levels. This level of disaggregation is important because of the requirements enshrined in the South African Constitution: that municipalities focus on job creation and poverty alleviation in their local economic development strategies. The population censuses and surveys such as the Community Survey are large enough to support subprovincial labour market analysis to meet this objective. Although the sample sizes of the specialised labour market surveys pose a constraint to subprovincial disaggregation, at national and provincial level, they provide a sound basis for evaluating the employment outcomes from Census 1996, Census 2001, and the Community Survey of 2007. It is assumed that plausible results between the two sets of instruments at provincial level will provide a reasonable indication of the quality of labour market outcomes at subprovincial levels.

2. DATA AND METHOD

2.2. Data

The data sources used are described in detail as follows: Census 1996 in Stats SA (1996); Census 2001 in Stats SA (2001a); Community Survey in Stats SA (2007a); October Household Survey (1996) in OHS 1996 Metadata, Stats SA, (1998); Labour Force Survey: September 2001 and March 2007, in Stats SA (2008). All these reports can be obtained from the Statistics South Africa website, www.statssa.gov.za.

2.2. Method

2.2.1. Employment Questions

The level of aggregate employment in the labour market was determined by the initial employment question in the censuses and the relevant specialised labour market surveys. Comparing that question is essential for establishing measurement difficulties that may have arisen in any given year between the census or Community Survey and the relevant specialised survey and over time across the various instruments.

Census 1996 included a version of the employment question similar to that used in the October Household Survey, albeit with some modifications. Unlike in the October Household Survey, a reference period for employment (of seven days prior to the interview) was not specified in the census questionnaire. In both instruments, the initial employment question focused on three broad categories of work (formal, informal, and farming activities). The list of activities associated with each type of work was indicated only as a guide for enumerators. In the October Household Survey, respondents were also required to indicate whether their work was full time or part time.[2]

In 2001, the key employment question in the Labour Force Survey included seven separate yes/no categories in an attempt to capture all forms of employment better. The question used in Census 2001 had four separate yes/no categories.[3]

In 2007, the initial employment question in the Community Survey was virtually identical to that of the Labour Force Survey conducted in March that year as well as the Labour Force Survey that had been conducted in September 2001.

2.2.2. Evaluating the Results Based on the Censuses and the CS

In a given year, the difference in employment between the census or Community Survey and the relevant specialised survey will be derived. In this regard,

the relevant years are in 1996, the difference between the census and the October Household Survey, in 2001, the difference between the census and the Labour Force Survey of September, and in 2007, the difference between the Community Survey and Labour Force Survey conducted in March.

Another aspect of the evaluation will focus on the censuses and Community Survey results as a series over the period 1996, 2001, and 2007, and the specialised surveys as another series over the same period. This approach provides insights into the quality of the census and Community Survey results in another respect.

3. RESULTS

Because of the reengineering of the Labour Force Survey undertaken by Stats SA, two measures of employment are used to evaluate the census and Community Survey results at national level. As part of the reengineering process and for the historical continuity of the labour market series, adjustments were made to the published Labour Force Survey series. Link factors were established between the Labour Force Surveys of 2008 and the new, independently conducted Quarterly Labour Force Surveys conducted in the first and second quarters that year. The details of the reengineering process were provided by Stats SA (2008). In essence, the linked series represents Stats SA's best estimate of what the Labour Force Survey would have shown if it had used a Quarterly Labour Force Survey questionnaire. This type of alignment was not undertaken for the October Household Survey, and it is therefore likely that the unlinked Labour Force Surveys may be more in line with the October Household Survey.[4]

Since the linked Labour Force Survey datasets are currently Stats SA's "official" source of historical labour market outcomes, this chapter relies mainly on those datasets for the evaluation of the census and Community Survey results. However, both the linked and unlinked Labour Force Surveys results are included at national level to provide insight into the scale of the revisions.

Analysis at provincial level is problematic because of boundary differences. The datasets used for 1996 (Census 1996 and the October Household Survey 1996) have been aligned to 2005 provincial boundaries; no alignment was undertaken to 2001 boundaries. The datasets for 2001 and 2007 (Census 2001; Labour Force Surveys of September 2001 and March 2007 as well as the Community Survey undertaken in 2007) have been aligned to both 2001 and 2005 boundaries. Thus an analysis of all datasets based on 2005 provincial boundaries is possible. However, the alignment of the Labour Force Surveys to 2005 provincial boundaries also incorporated the adjustments which linked the Labour Force Survey series to the Quarterly Labour Force Survey. When only the linked Labour Force Survey series is analysed, consistency in boundary alignment over the years is partly at the expense of consistency in the level of employment over time.

Table 5.1 Employment levels and differentials by sex (LFSs linked to QLFS)

	1996		2001		2007		Difference*			% Difference		
	Census	OHS	Census	LFS	CS	LFS	1996	2001	2007	1996	2001	2007
	Thousand		Thousand		Thousand		Thousand			Percent		
Employed												
Male	5,467	5,311	5,573	6,438	7,017	7,457	–156	865	440	–2.9	15.5	6.3
Female	3,626	3,630	3,991	5,221	5,311	5,868	4	1,230	557	0.1	30.8	10.5
M&F	**9,093**	**8,940**	**9,564**	**11,660**	**12,328**	**13,326**	**–153**	**2,095**	**997**	**–1.7**	**21.9**	**8.1**
Working age												
Male	11,273	11,625	13,455	12,979	14,273	14,352	352	–476	79	3.1	–3.5	0.6
Female	12,548	13,092	14,784	14,550	15,461	15,856	544	–235	395	4.3	–1.6	2.6
M&F	**23,821**	**24,717**	**28,239**	**27,528**	**29,734**	**30,208**	**896**	**–711**	**473**	3.8	–2.5	1.6
Labour absorption rate (%)												
Male	48.5	45.7	41.4	49.6	49.2	52.0	–2.8	8.2	2.8	—	—	—
Female	28.9	27.7	27.0	35.9	34.4	37.0	–1.2	8.9	2.7	—	—	—
M&F	**38.2**	**36.2**	**33.9**	**42.4**	**41.5**	**44.1**	**–2.0**	**8.5**	**2.7**	—	—	—

Note: LFSs include adjustment for alignment with QLFS.
*refers to specialised survey minus census or CS. OHS '96 includes the institutional population

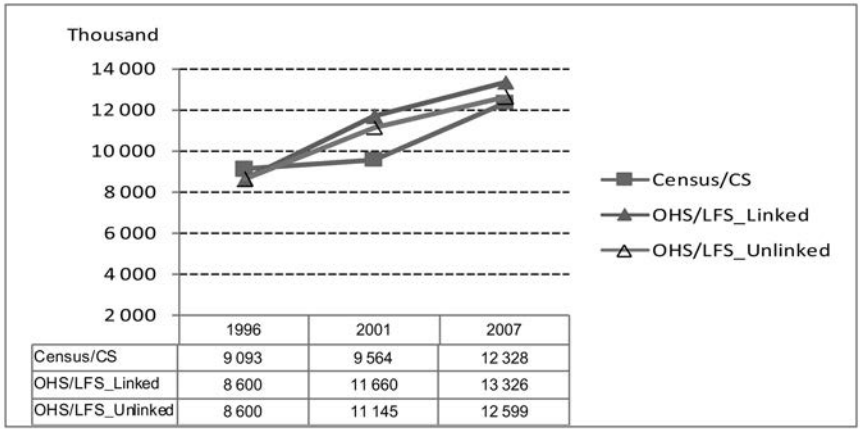
3.1. National Employment Levels, Differentials, and Trends

Table 5.1 and Figure 5.1 show that in 1996, there were 1.7% fewer employed persons reported in the specialised survey compared with the census. In 2001, compared with the census, the specialised survey results (linked and unlinked) were higher by around 15% among men but by 18.3% (unlinked) and 30.8% (linked) among women. In 2007, aggregate employment levels in the specialised survey (linked and unlinked) were higher than in the Community Survey among both men and women but by a substantially smaller amount than had occurred in 2001.

The labour absorption rate measures the proportion of the population in various subgroups that contributes to the production of goods and services in the country. Table 5.1 shows that, among both men and women, differences in this key labour market indicator between the census or Community Survey and the specialised survey were highest in 2001 and relatively small in 1996 and 2007.

A number of factors are likely to explain the differences in the employment outcomes in any given year or across time. In 1996, miners were not adequately captured in the October Household Survey, as reflected in the lower level of employment compared with the census. When adjustments are made to exclude the institutional population from the benchmarks used to raise the October Household Survey results, the level of employment is even lower (8,600,000 instead of 8,940,000), and the differential between the census and the October Household Survey results is greater.

Compared with the specialised survey, the higher employment level in Census 1996 suggests that the lack of a reference period for employment



	1996	2001	2007
Census/CS	9 093	9 564	12 328
OHS/LFS_Linked	8 600	11 660	13 326
OHS/LFS_Unlinked	8 600	11 145	12 599

Figure 5.1 Trends in aggregate employment

meant that respondents had a longer reporting window (the month of October) compared with the October Household Survey, for which the reference period moved over a two-week period (the first two weeks of November). In 2001, the underreporting of informal-sector employment in Census 2001 is largely responsible for the divergence in the employment outcomes between the census and the specialised survey.

In 2007, the difference between the Community Survey and the Labour Force Survey was relatively small (221,000) based on the unlinked series and somewhat larger (997,000) after the linking process. Given that the employment question was identical in both instruments, it is likely that differences in the timing and duration of the enumeration phase may be largely responsible. In this regard, employment outcomes in the Community Survey referred to the first week of February, whereas in the Labour Force Survey, the reference period was the first week of March. The enumeration phase in the Community Survey was one month as opposed to two weeks in the Labour Force Survey. Also, both the Community Survey and the Labour Force Survey are sample surveys with very different sampling methodologies.

Excluding 2001 because of the underreporting of informal-sector employment in Census 2001, the trend over the period 1996 and 2007 is likely to be affected by the following factors. In 1996, the structure of the employment question was broadly similar in the census and the specialised survey. In 2007, the employment question was identical in the Labour Force Survey and the Community Survey. However, over the period 1996 and 2007, there were notable improvements to the question. Casale and Posel (2003) argue that employment was lower in the October Household Survey than in the Labour Force Survey because of changes to the question. Also, Budlender and Hirschowitz (2000) confirm that there were substantial differences in the questions that were used to determine employment in the Labour Force Survey compared with the October Household Survey. Thus, in 1996, the level of employment (based on Census 1996 and the October Household Survey) may be lower than would have resulted had a Labour Force Survey type of questionnaire been used. If it were possible to link the October Household Survey and Census 1996 results to the revised Labour Force Survey series, the level of employment from both instruments is likely to be higher. However, all else being equal, over the period 1996 and 2007, the moving reference period in Census 1996 for the duration of one month captured more employment and thus compensated for the fixed reference period in the Community Survey and the greater detail in the Labour Force Survey type of questions included in the Community Survey. Yet caution is still required in analysing employment trends over the period 1996 and 2007, as seasonality issues in the labour market make comparisons more difficult between October (when Census 1996 was conducted) and February (when the Community Survey was conducted).

Table 5.2 Sectoral employment levels and differentials

	1996		2001		2007		1996	2001	2007	1996	2001	2007
	Census	OHS	Census	LFS	CS	LFS	Difference (Thousand)*			% Difference		
Formal sector ('000)	n.a.	n.a.	6,798	7,403	7,724	8,940	n.a.	606	1,216	n.a.	8.9	15.7
Informal sector ('000)	n.a.	n.a.	782	2,129	1,857	2,432	n.a.	1,347	575	n.a.	172.3	31.0
Uns sector ('000)	n.a.	n.a.	90	0	937	0	n.a.	–90	–937	n.a.	—	—
Agriculture ('000)	810	756	957	861	826	703	–54	–96	–123	–6.7	–10.1	–14.9
Private hholds ('000)	1,050	801	938	1,267	985	1,251	–249	329	266	–23.7	35.1	27.0
Employed ('000)	9,093	8,940	9,564	11,660	12,328	13,326	–153	2,095	997	–1.7	21.9	8.1
Working age ('000)	23,821	24,717	28,239	27,528	29,734	30,208	896	–711	473	3.8	–2.5	1.6
Absorption rate (%)	38.2	36.2	33.9	42.4	41.5	44.1	–2.0	8.5	2.7	—	—	—
Formal Absorption rate (%)	n.a.	n.a.	24.1	26.9	26.0	29.6	n.a.	2.8	3.6	—	—	—

Note: LFSs include adjustment for alignment with QLFS.
*refers to specialised survey minus census or CS. OHS '96 includes the institutional population

3.2. Sectoral Employment at National Level

The disaggregation of employment into the formal and informal sectors provides added insight into the quality of the employment results. The relevant question was not included in Census 1996. In 2001 and 2007, respondents were simply asked whether they worked in the formal or informal sector. A note guided enumerators that formal sector employment was based on company registration. Table 5.2 suggests that improvements to the employment question over the years are likely to have had a greater impact on trends over time than between the instruments in any given year—except 2001. In that year, the employment question in Census 2001 was burdened by complicated categories relating to "formal nonfarming," "informal nonfarming," "farming," and "temporary absence" that probably made its administration difficult.[5] Both Census 2001 and the September Labour Force Survey had fixed reference periods for employment. Despite this, the longer enumeration phase in the former (one month) is likely to have made it even more difficult for respondents who were employed intermittently in the "informal nonfarming sector" to remember their employment status several weeks earlier.

In 2001, the difference in employment was largely on account of the informal sector, which was 172.3% higher in the Labour Force Survey compared with the census (Table 5.2). Therefore, Stats SA (2001b, p. vi) cautioned that ". . . there is possible under-reporting of employment in the informal and subsistence agriculture sectors." In contrast, in that year, formal-sector employment was higher in the specialised survey by only 8.7% compared with the census.

3.3. Provincial Employment Levels and Differentials

The source of provincial differences in employment also depends on the economic structure of each province and is linked to the value added by the various industries. Regional estimates of gross domestic product by Stats SA (2007b) show that in 2006, value added by the agriculture industry accounted for 7% of the goods and services produced in Northern Cape but less than 1% in Gauteng. Whereas the mining industry accounted for more than 20% of the value of goods and services produced in Northern Cape, North West, and Limpopo, in other provinces such as Western Cape and Eastern Cape, there was little such industrial activity. Manufacturing accounted for 15% to 25% of the output in Western Cape, Eastern Cape, KwaZulu-Natal, Gauteng, and Mpumalanga but less than 5% in provinces such as Limpopo and Northern Cape. Given the varied economic structure of the provinces, seasonal factors are likely to play a role in explaining differences in employment. In this regard, the one-month difference between the timing of the specialised labour market survey and the censuses or CS is also likely to have had an impact on the comparability of the provincial results.

Table 5.3 Provincial employment levels and differentials

	1996		2001		2007		Difference*			% Difference		
	Census_Oct	OHS_Nov	Census_Oct	LFS_Sep	CS_Feb	LFS_Mar	1996	2001	2007	1996	2001	2007
	Thousand		Thousand		Thousand		Thousand			Percent		
WC	1,372	1,381	1,487	1,637	1,904	1,869	9	150	–36	0.7	10.1	–1.9
EC	779	814	749	1,143	1,104	1,251	35	394	147	4.5	52.6	13.3
NC	230	225	222	306	268	317	–5	84	49	–2.1	37.9	18.3
FS	700	687	590	835	709	818	–12	245	108	–1.8	41.6	15.3
KZN	1,572	1,557	1,602	2,120	2,180	2,553	–16	518	373	–1.0	32.3	17.1
NW	701	579	700	733	782	860	–122	33	78	–17.4	4.8	10.0
GP	2,576	2,588	2,932	3,303	3,681	3,890	12	371	209	0.5	12.7	5.7
MP	617	634	626	794	884	904	17	168	20	2.7	26.8	2.3
LP	547	476	656	789	816	864	–72	132	48	–13.1	20.1	5.9
RSA	**9,093**	**8,940**	**9,564**	**11,660**	**12,328**	**13,326**	**–153**	**2,095**	**997**	**–1.7**	**21.9**	**8.1**

Note: Based on 2005 boundaries. LFSs include adjustment for alignment with QLFS.
*refers to specialised survey minus census or CS. OHS includes institutional population

Table 5.3 shows higher levels of employment in 1996 in the census in several provinces (Northern Cape, North West, Free State, KwaZulu-Natal, and Limpopo) compared with the specialised survey. In 2001, in six of the nine provinces, employment was more than 20% higher in the specialised survey compared with the census. In 2007, the Labour Force Survey results ranged between 10% and 18% higher than the Community Survey in Eastern Cape, Northern Cape, North West, Free State, and KwaZulu-Natal.

Mining employment was 53.9% lower in the October Household Survey compared with Census 1996 (Table 5.6). In provinces such as Free State and North West, the October Household Survey results were 66.6% and 59.5% respectively lower than Census 1996.

3.4. Sectoral Employment Levels and Differentials by Province

In 2001, the underreporting of informal-sector activity in the census was widespread. Table 5.4 shows that in every province, informal-sector employment based on the Labour Force Survey was more than double the figure reported in Census 2001. In provinces such as Eastern Cape, Mpumalanga, and Limpopo, where the informal sector makes a relatively large

Table 5.4 Informal sector employment by province in 2001

	2001		2007		Difference*		% Difference	
	Census: Oct	LFS: Sep	CS: Feb	LFS: Mar	2001	2007	2001	2007
	Thousand		Thousand		Thousand		Percent	
WC	64	163	232	221	99	–11	154.9	–4.8
EC	61	324	231	323	263	92	429.9	40.0
NC	10	29	29	23	19	–6	193.5	–21.3
FS	36	99	102	130	63	28	175.2	27.7
KZN	179	399	351	472	220	121	123.5	34.4
NW	47	127	93	161	80	67	169.5	71.8
GP	244	524	483	670	280	188	114.9	38.9
MP	60	184	149	201	124	52	206.7	34.7
LP	81	280	186	230	198	44	243.5	23.7
RSA	**782**	**2,129**	**1,857**	**2,432**	**1,347**	**575**	**172.3**	**31.0**

Note: Based on 2005 boundaries. LFSs include adjustment for alignment with QLFS.
*refers to specialised survey minus census or CS

contribution to total employment, the underreporting of informal-sector activities in Census 2001 was most pronounced. In 2007, compared with the Community Survey, informal-sector employment was also higher in the Labour Force Survey in seven of the nine provinces—but by a substantially smaller margin than in 2001.

Compared with the informal sector, Table 5.5 shows that formal-sector employment was more consistent between the census or Community Survey and the relevant specialised survey. However, relatively large percentage differences are evident in some provinces. In 2001, except in North West and Limpopo, the Labour Force Survey captured higher levels of formal-sector employment than the census. In Free State, formal-sector employment in the Labour Force Survey was 43.8% higher than the census, in KwaZulu-Natal it was 19.7% higher, and in both Northern Cape and Mpumalanga, it was 18.8% higher. In 2007, in every province except Mpumalanga, formal-sector employment was also higher in the specialised survey. In Eastern Cape, the percentage difference in formal-sector employment between the Community Survey and the specialised survey was highest (40.0%); the share of the formal sector in total employment was therefore 11.2 percentage points higher in the specialised survey compared with the Community Survey.

Table 5.5 Formal-sector employment

	2001		2007		Difference*		% Difference	
	Census: Oct	LFS: Sep	CS: Feb	LFS: Mar	2001	2007	2001	2007
	Thousand		Thousand		Thousand		Percent	
WC	1,106	1,146	1,283	1,385	40	102	3.6	8.0
EC	520	551	523	732	31	209	6.0	40.0
NC	128	152	164	216	24	52	18.8	31.7
FS	356	512	436	547	156	111	43.8	25.5
KZN	1,120	1,341	1,272	1,663	221	391	19.7	30.7
NW	495	453	532	550	–42	18	–8.5	3.4
GP	2,326	2,446	2,564	2,823	120	259	5.2	10.1
MP	383	455	531	528	72	–3	18.8	–0.6
LP	362	349	417	496	–13	79	–3.6	18.9
RSA	**6,798**	**7,403**	**7,724**	**8,940**	**605**	**1,216**	**8.9**	**15.7**

Note: Based on 2005 boundaries. LFSs include adjustment for alignment with QLFS.
*refers to specialised survey minus census or CS

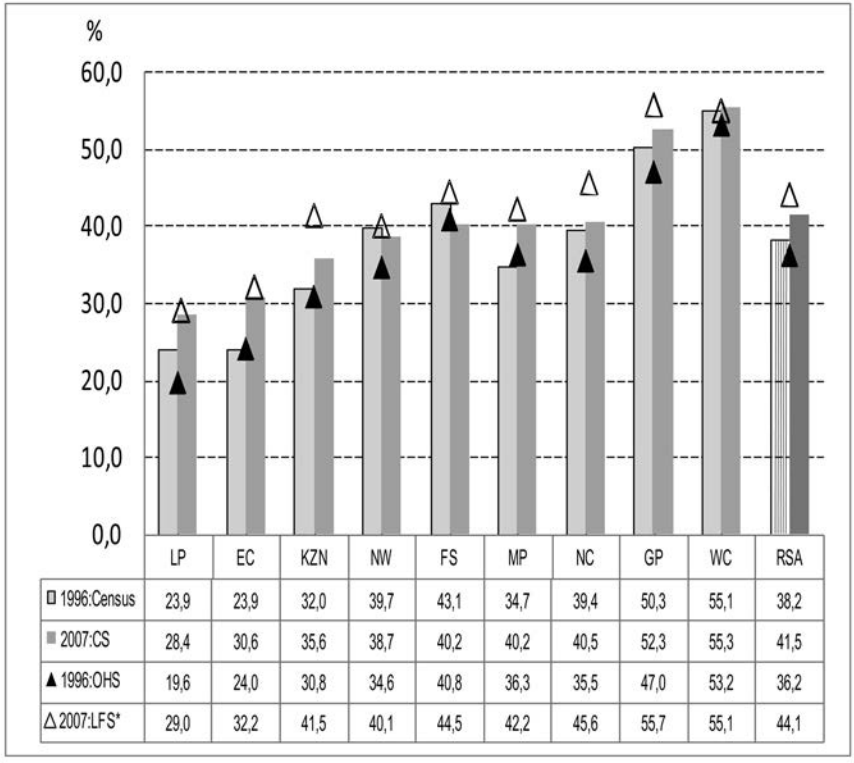
3.5. Provincial Trends in Employment

Provincial trends in employment exclude 2001 because of the underreporting of informal-sector employment in Census 2001.

Despite differences in the levels of employment, in every province, between 1996 and 2007, the trend in aggregate employment and formal-sector employment based on the census/Community Survey series is similar to the October Household Survey/Labour Force Survey series.

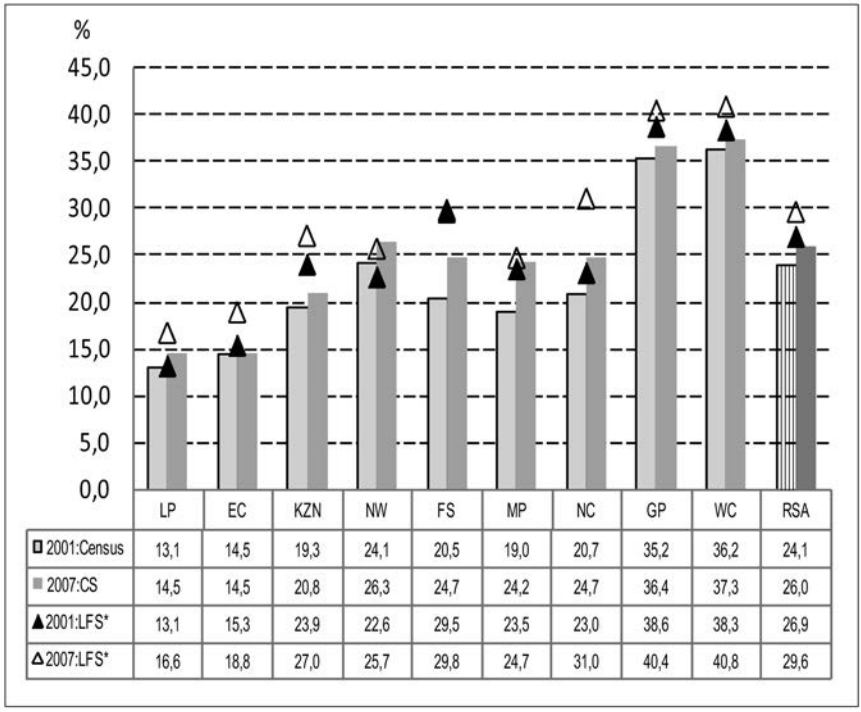
Figure 5.2 shows that, based on the census/Community Survey series, the labour absorption rate in North West and Free State declined between 1996 and 2007. In contrast, over the same period, in both provinces there was an increase in the labour absorption rate based on the specialised labour market series. This is probably attributable to deficiencies in the October Household Survey results with respect to the coverage of mining hostels.

Provincial trends in the formal-sector labour absorption rate based on the census/Community Survey series are similar to those of the Labour Force



	LP	EC	KZN	NW	FS	MP	NC	GP	WC	RSA
1996:Census	23,9	23,9	32,0	39,7	43,1	34,7	39,4	50,3	55,1	38,2
2007:CS	28,4	30,6	35,6	38,7	40,2	40,2	40,5	52,3	55,3	41,5
▲1996:OHS	19,6	24,0	30,8	34,6	40,8	36,3	35,5	47,0	53,2	36,2
△2007:LFS*	29,0	32,2	41,5	40,1	44,5	42,2	45,6	55,7	55,1	44,1

Figure 5.2 Provincial levels and trends in labour absorption rate



	LP	EC	KZN	NW	FS	MP	NC	GP	WC	RSA
2001:Census	13,1	14,5	19,3	24,1	20,5	19,0	20,7	35,2	36,2	24,1
2007:CS	14,5	14,5	20,8	26,3	24,7	24,2	24,7	36,4	37,3	26,0
▲2001:LFS*	13,1	15,3	23,9	22,6	29,5	23,5	23,0	38,6	38,3	26,9
△2007:LFS*	16,6	18,8	27,0	25,7	29,8	24,7	31,0	40,4	40,8	29,6

Figure 5.3 Provincial levels and trends in the formal-sector labour absorption rate

Survey series except in Eastern Cape and Free State (Figure 5.4). In the former, the rate increased over the period 2001 to 2007 based on the Labour Force Survey series, while the census/Community Survey results suggest it was unchanged. In Free State, the census/Community Survey series suggests that the rate increased between 2001 and 2007, whereas the specialised survey results suggest that it stagnated. In both provinces, the relatively large percentage difference in the level of formal-sector employment between the two series is a contributing factor based on the Community Survey. Whereas a relatively high percentage of persons did not specify their sector of employment in Eastern Cape (14.6%), in Free State formal-sector employment was misreported.

3.6. Sociodemographic and Economic Profile

The profiles of employed persons (in 1996 and 2007) and of those employed in the formal sector (in 2001 and 2007) by various sociodemographic and economic variables also provide insight into the comparability of the census and Community Survey results.

Over both periods—1996 and 2007 and 2001 and 2007—the demographic profile of employed persons and those in formal-sector employment between the census or Community Survey and the relevant specialised

Table 5.6 Sociodemographic profile

	All employed persons				Employed in the formal sector			
	1996 (%)		2007 (%)		2001 (%)		2007 (%)	
	Census	OHS	CS	LFS	Census	LFS	CS	LFS
Age								
15–24 yrs	12.6	12.3	12.6	11.3	10.6	10.7	10.8	11.0
25–34 yrs	34.6	33.4	30.8	33.8	33.5	34.6	31.8	35.2
35–44 yrs	29.6	30.6	28.7	26.9	31.4	29.5	29.7	27.0
45–54 yrs	16.8	16.9	19.7	19.2	18.2	18.5	19.9	18.7
55–64 yrs	6.4	6.8	8.2	8.8	6.2	6.7	7.7	8.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Sex								
Male	60.1	59.4	56.9	56.0	61.5	61.3	60.9	61.0
Female	39.9	40.6	43.1	44.0	38.5	38.7	39.1	39.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Population group								
African	62.4	61.3	67.0	70.3	57.2	57.7	58.7	62.1
Coloured	12.4	13.6	11.6	11.2	12.8	12.1	12.5	12.4
Indian	4.0	3.8	3.8	3.2	5.3	5.0	5.1	4.3
White	20.4	21.4	17.6	15.3	24.7	25.2	23.7	21.2
Unsp/other	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Education level								
None	11.4	7.9	5.1	4.8	6.2	2.7	2.6	2.2
Less than matric	52.6	52.8	56.4	51.4	42.1	43.1	48.2	41.4
Matric	19.0	23.9	22.6	28.3	31.6	32.0	27.4	34.9
Higher	12.4	14.3	14.8	15.0	20.1	20.9	20.8	21.0
Unsp/other	4.6	1.0	1.1	0.5	0.0	1.2	1.0	0.5
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Note: LFSs include adjustment for alignment with QLFS. OHS'96 includes institutional population

survey is consistent. However, in terms of educational attainment, relatively large differences emerge between the Community Survey and Labour Force Survey in 2007. Based on the Community Survey, a higher percentage of employed persons as well as persons employed in the formal sector did not complete their matriculation year (Grade 12) than is suggested by the

specialised survey. On the other hand, compared with the specialised survey, the Community Survey suggests that a lower percentage of both groups had completed matric. This may reflect inconsistencies in reporting in the Community Survey among all employed persons and the misreporting of formal sector activities.

Table 5.7 Economic profile

	All employed persons				Employed in the formal sector			
	1996 (%)		2007 (%)		2001 (%)		2007 (%)	
	Census	OHS	CS	LFS	Census	LFS	CS	LFS
Industry								
Agriculture & Mining	14.9	11.2	10.3	8.4	5.5	5.4	5.5	4.6
Manufacturing, Utilities, & Construction	19.6	21.6	20.8	23.1	22.9	26.0	24.4	26.7
Trade, Transport, & Finance	24.8	29.0	28.3	40.9	35.8	42.8	34.2	45.0
Services	28.9	31.5	23.7	27.7	25.9	25.8	21.8	23.8
Unspecified/Missing	11.8	6.8	16.8	0.0	10.0	0.0	14.1	0.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Occupation								
Managers, Professionals, & Technicians	19.5	22.6	26.8	22.4	28.8	31.2	34.2	27.9
Clerks, Sales	16.8	21.3	17.6	25.5	26.4	29.6	21.2	29.9
Artisans, Operators, & Skilled Agric Workers	26.7	24.5	22.9	25.6	24.3	25.8	22.1	25.1
Elementary	26.1	25.5	14.8	26.6	13.5	13.4	8.7	17.1
Unspecified/Missing	10.8	6.1	17.9	0.0	7.0	0.0	13.7	0.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Employment status								
Employee	79.9	91.6	79.3	81.3	91.9	93.5	91.1	93.4
Own account	9.8	6.8	12.3	18.2	7.8	6.1	7.1	6.5
Unpaid in household business	1.5	n.a.	2.1	0.4	0.3	0.4	0.1	0.2
Unspecified/Missing	8.7	1.6	6.3	0.1	0.0	0.0	1.6	0.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Note: LFSs include adjustment for alignment with QLFS. OHS '96 includes institutional population

Table 5.7 shows that unspecified industry and occupation (in percentage terms) was larger in the censuses and Community Survey compared with the relevant specialised survey. In each period (1996 and 2007 and 2001 and 2007), the trade/transport/finance industry jointly accounted for a higher percentage of the total in the specialised survey compared with the census or Community Survey. In terms of occupations, the largest differences between the Community Survey and the specialised survey occurred in 2007. In this regard, in the specialised survey, elementary occupations accounted for a higher percentage of all employed persons and also of those working in the formal sector. In 1996, the status-in-employment question was asked differently (in Census 1996) compared with the October Household Survey—hence the large difference in the percentage of employees. In other years, the results are reasonably consistent.

3.7. Subprovincial Labour Market Indicators

Three spheres of government were created by the Constitution: national, provincial, and local. Across the country, municipalities were also demarcated in three categories. Category A comprises six metropolitan areas; Category B comprises 231 local municipalities and 25 District Management Areas (DMAs); and Category C comprises 46 district municipalities.[6] Each District municipality is made up of a group of local municipalities and District Management Areas.

The analysis that follows is only broadly indicative of labour market outcomes; caution is required in interpreting the trends over time because unlike the censuses, the Community Survey is subject to sampling variability. Also, the rebenchmarking of the Community Survey to more recent population totals may result in changes to the distributions.

3.8. Labour Absorption Rate at Subprovincial Levels 1996 to 2007

As noted earlier, although in North West and Free State the trend in employment over the period 1996 to 2007 is similar in the census/Community Survey series and the specialised survey series, the trend in the labour absorption rate differs. The underreporting of mining activities in the October Household Survey is likely to be responsible, but caution is required in interpreting the trends over time in these provinces.

The district councils (DCs) which experienced the largest increases in the absorption rate between 1996 and 2007 were among those where the labour absorption rates in 1996 were lowest (Figure 5.6). In three district councils, the absorption rate increased by more than 10 percentage points over the period 1996 and 2007: O. R. Tambo in Eastern Cape (from 12.7% to 32.1%); Umkhanyakude in KwaZulu-Natal (from 15.1% to 33.2%), and Alfred Nzo in Eastern Cape (from 12.0% to 23.7%). Increases of

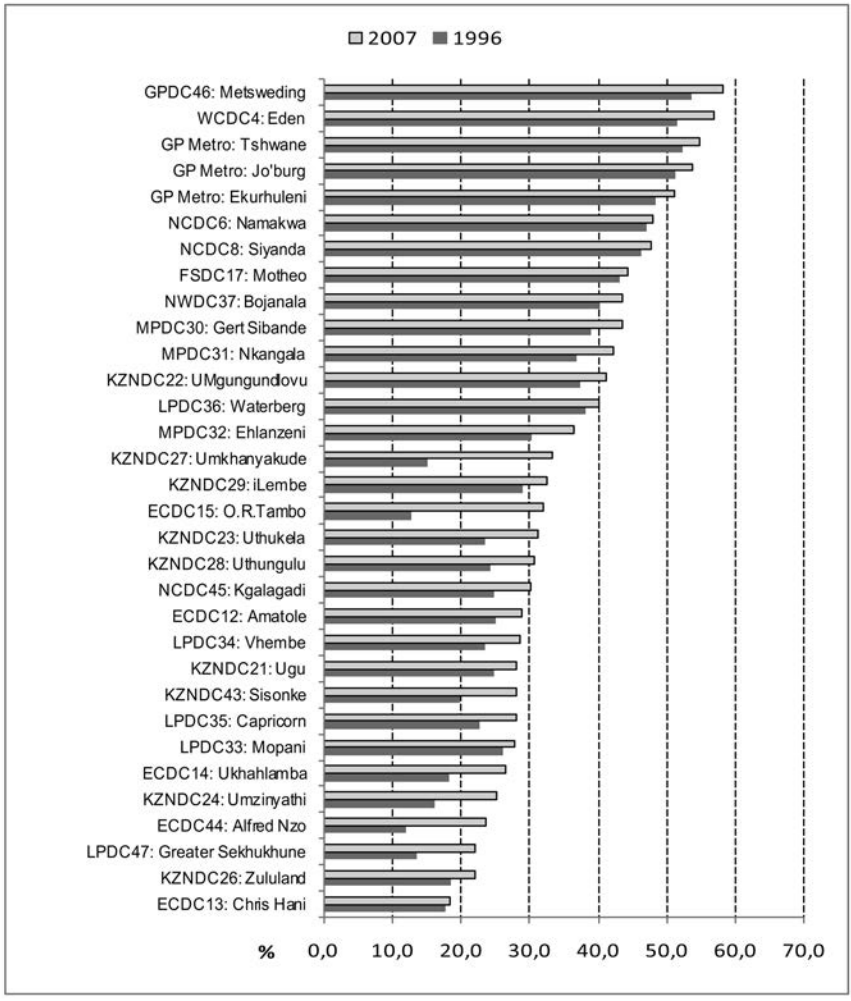


Figure 5.4 District councils where the labour absorption rate increased 1996–2007

these magnitudes imply that on average, the absorption rate increased by less than 2.0 percentage points each year over the 1996 to 2007 period. An important contributory factor may well be that these are among the thirteen nodal areas identified by government in 2001 for specific interventions under an Integrated Sustainable Rural Development Programme (ISRDP).[7]

The district councils where the largest declines in labour absorption rate (Figure 5.5) occurred were those in which the gold mining or agriculture industries made an important contribution to employment. Substantial contractions in mining employment occurred in Lejweleputswa in the Free State

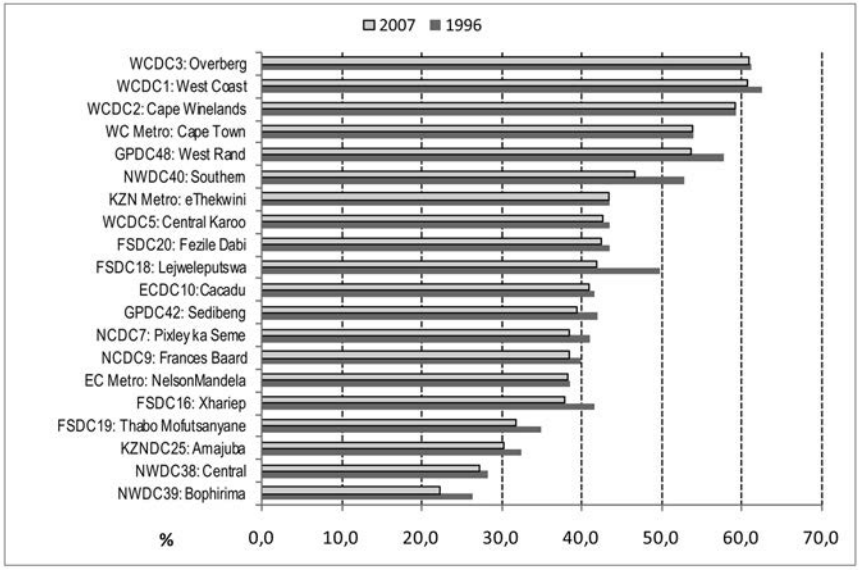


Figure 5.5 District councils where the labour absorption rate declined between 1996 and 2007

(particularly in the Mathjhabeng municipality). In the Southern Region of North West (in the Matlosana and Merafong City municipalities) and in the West Rand district council of Gauteng (in Westonaria municipality), a similar situation occurred. In district councils that were heavily reliant on agriculture, the declines in the labour absorption rate were also among the largest (Bophirima in North West and Thabo Mofutsanyane and Xhariep in Free State).

3.9. Formal Sector Labour Absorption Rate at Subprovincial Levels 2001 to 2007

In Eastern Cape and Free State, based on the census/Community Survey series, the trend in the formal-sector labour absorption rate over the period 2001 to 2007 is different from the specialised labour market surveys, even though the trend in formal-sector employment is similar in the two series. The relatively large percentage difference in the level of formal-sector employment between the two series is likely to be a contributing factor, and caution should therefore be exercised when interpreting the results for these provinces.

The largest increase over the period 2001 and 2007 in the formal-sector absorption rate was 9.7 percentage points in Gert Sibande in Mpumalanga. An increase of this magnitude implies that on average, the formal-sector

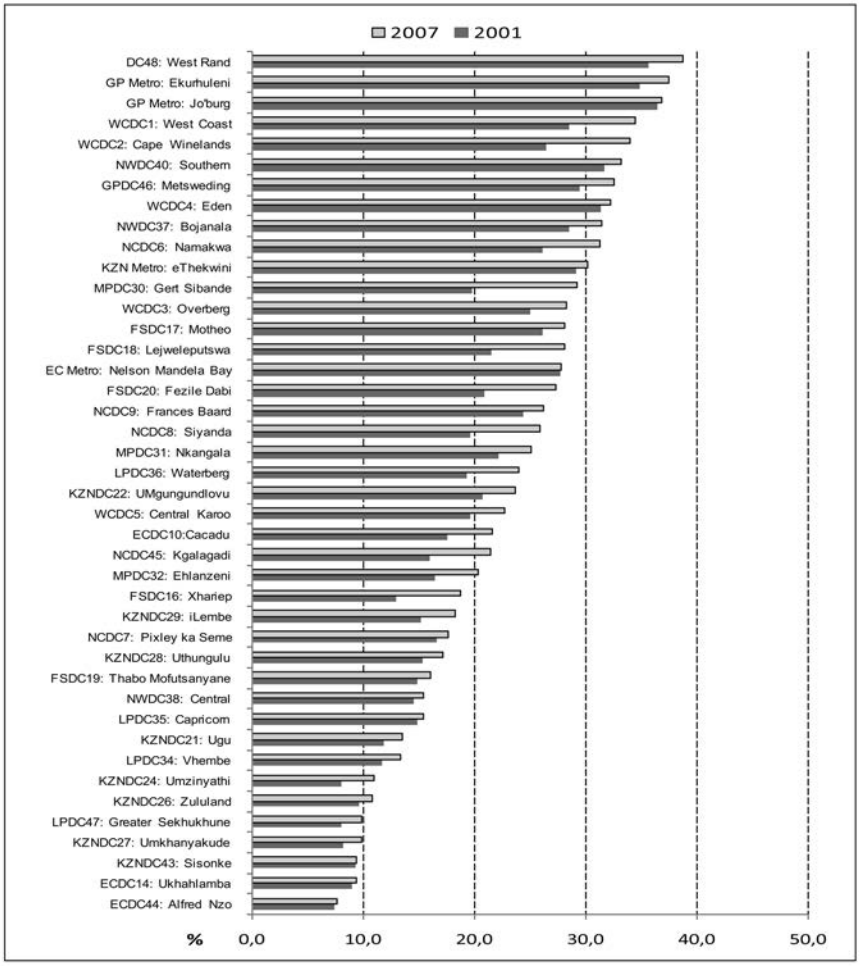


Figure 5.6 District councils where the formal-sector labour absorption rate increased between 2001 and 2007

absorption rate increased by less than 2.0 percentage points each year over the 2001 to 2007 period.

Notably, the formal-sector labour absorption rate increased over the period 2001 to 2007 in all nodal areas except O.R. Tambo and Chris Hani in the Eastern Cape. In five of the nodal areas, the increase in the formal-sector absorption rate over the period 2001 and 2007 ranged between 2 and 10 percentage points. In the district councils where the formal-sector labour absorption rate declined over the period 2001 and 2007 (Figure 5.7), the largest decline occurred in Amajuba in KZN, where the rate was lower by 2.0 percentage points in 2007).

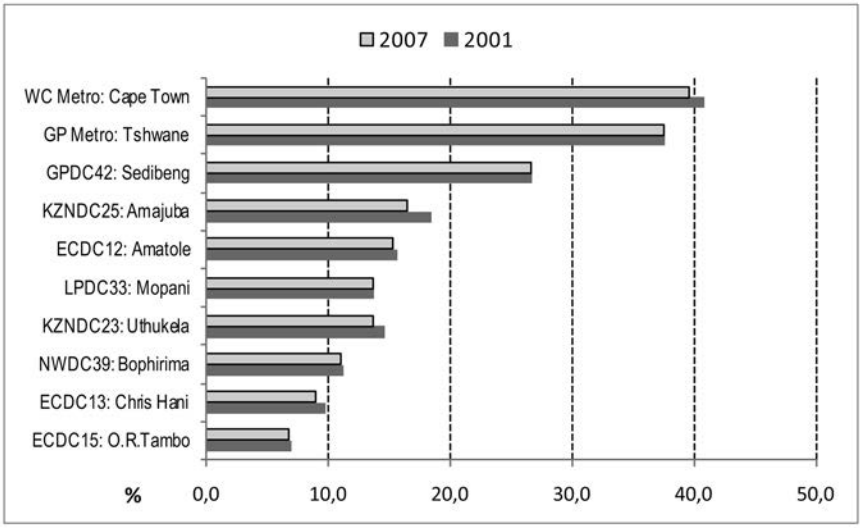


Figure 5.7 District councils where the formal-sector labour absorption rate declined between 2001 and 2007

4. DISCUSSION

The need for reliable small-area labour market information has become increasingly important in postapartheid South Africa. Although the 1996 and 2001 population censuses and the large-scale Community Survey conducted in 2007 enable disaggregation at subprovincial levels, Stats SA has cautioned users about the labour market results of these when compared with the relevant specialised labour market surveys. Changes to the initial employment question have been partly responsible.

The evaluation in this chapter suggests that except in 2001, these changes are likely to have had more of an impact on the level of employment across time rather than between the censuses or Community Survey and the relevant specialised survey in a given year. In 2001, unlike the survey, the employment question in Census 2001 was burdened by categories relating to "formal nonfarming," "informal nonfarming," and "farming" activities that were perhaps difficult to administer. It is widely recognised that even in specialised surveys, where detailed questions can be included, informal-sector activity may be underrecorded. In this regard, the International Labour Organisation (ILO, 2003, p. 49) cautions that this is "because persons engaged in very small-scale or casual self-employment activities may not report that they are self-employed or employed at all." It is precisely because of such considerations that over the years, Stats SA has revised the structure of the initial employment question in the specialised surveys and introduced additional questions to determine an objective measure of informal-sector

employment. In the context of large-scale operations such as the census or Community Survey where only one question is asked, the problem of underreporting (as occurred in 2001) and misreporting (as occurred in 2007) of such activities is likely to be magnified. This in turn has implications for the level of aggregate employment and the distribution between the two sectors. Thus in the censuses and Community Survey, the formal/informal distinction is only broadly indicative of sectoral outcomes.

Over and above differences in the structure of the employment questions asked, the questionnaire layout was different in each of the post-apartheid censuses and the Community Survey when compared with the specialised labour market surveys. Also, questionnaires translated into the official languages were not administered to respondents in the specialised surveys. Other issues are also likely to have contributed to the differences in the results between the censuses or Community Survey and the relevant specialised survey. These relate to differences in the sample size of the October Household Survey (16,000 households) versus the LFSs (30,000 households); the impact of introducing a master sample in the LFS series as against the smaller and more clustered independent sample used for the October Household Survey; imputation in Census 2001 and in Community Survey but not in Census 1996 or in the specialised surveys; differences in the size of the undercount between the two censuses; and the differences that arise due to the *de facto* definition used in the censuses as against the *de jure* definition used in the specialised surveys. It is also likely that given the large-scale nature of the censuses and the Community Survey, the training of enumerators, fieldwork quality, data processing, and coding may not always have achieved the high standards of the substantially smaller specialised surveys. Notably, the one-month difference in timing between the censuses or Community Survey and the relevant specialised labour market survey may also be an explanatory factor for the divergent employment outcomes. This is particularly true with respect to employment in industries that are known to be subject to seasonal variations. When such industries make a relatively large contribution to employment in any province, differences between the censuses or Community Survey and the relevant specialised survey will legitimately arise.

It is impossible to determine the combined effect of these factors on the level of employment in the various datasets. However, excluding 2001, provincial trends in aggregate employment (between 1996 and 2007) and formal-sector employment (between 2001 and 2007) are similar in the census/Community Survey series and the specialised surveys. Additionally, in seven of the nine provinces, the trend in the labour absorption rate (between 1996 and 2007) and formal-sector labour absorption rate (between 2001 and 2007) is similar in the two series.

The trend analysis in this chapter has shown that improvements to the employment question used in the census/Community Survey series between 1996 and 2007 may have contributed to the higher level of aggregate

employment over the period. However, the fixed reference period of one week in the Community Survey as against the one-month reference period in Census '96 is likely to have been a major compensating factor in aligning the results of the two instruments over the period 1996 and 2007.

At the district council level, over the eleven-year period 1996 to 2007, two of the three district councils which had the largest increases in the labour absorption rate were in one of the nodal areas of Eastern Cape that was targeted in 2001 for special interventions under the Integrated Sustainable Rural Development Programme (ISRDP). In the district councils where the labour absorption rate declined over the period 1996 and 2007, the largest declines generally occurred in district councils where the agriculture and/or gold mining industry make a relatively large contribution to total employment. Over the shorter period 2001 to 2007, the results indicate that in all but two of the thirteen nodal areas identified in 2001, the formal-sector labour absorption rate increased.

In most provinces, the similarity in the trends of the labour absorption rate and formal-sector labour absorption rate based on the census/Community Survey series and that of the relevant specialised labour market surveys provide the basis for subprovincial analysis of labour market outcomes. However, caution must be exercised in interpreting these results because unlike the censuses, the Community Survey is a sample survey subject to sampling variability, and further investigation is required to confirm these findings.

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NOTES

1. Under apartheid, four of the ten homeland areas were considered by the apartheid government to be separate countries and thus were not included in official statistical exercises.
2. The October Household Survey also included a question to validate the responses to the initial employment question.
3. The same three categories that were stipulated as a guide for enumerators in Census 1996 and the October Household Survey plus "temporary absence."
4. Although it is believed that the structure of the October Household Survey employment question captured less employment than the Labour Force Survey version.

5. In Census '01, each category required a separate yes/no answer, whereas in Census '96, the categories were used as a note to guide enumerators.
6. For convenience, Category B municipalities will be referred to as "municipalities"; Category C municipalities will be referred to as "District Councils" (DCs). And for ease of analysis, metropolitan areas are included with district councils.
7. ISRDP nodes in 2001: Eastern Cape—Alfred Nzo; Chris Hani; O.R. Tambo; Ukhahlamba; KwaZulu-Natal—Ugu; Umzinyathi Umkhanyakude; Zululand; Limpopo & Mpumalanga—Sekhukhune; Eastern/Gert Sibande; Northern Cape & North West—Kgalagadi; Western Cape—Central Karoo; Free State—Thabo Mofutsanyane.

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6 Trends and Patterns of Reporting Causes of Death in South Africa

Maletela Tuoane-Nkhasi and Abram Moyo

1. INTRODUCTION

Data on causes of death provide an important source of information on death. The data are crucial for monitoring the reasons people die and for targeting where, when, and how health resources should be used (Goel et al., 2007). The data also provide a valuable measure for assessing the health status of a population and for formulating health plans and policies to prevent or reduce premature mortality and improve the quality of life (Connecticut Department of Public Health, 2010). "Statistics on causes of death are probably the most important single item in any vital statistics system for the planning and administration of health services . . ." Broderick (1955: 159).

The twentieth World Health Assembly in 1967 defined the causes of death to be entered on the medical certificate of cause of death as "all those diseases, morbid conditions or injuries which either resulted in or contributed to death and the circumstances of the accident or violence which produced any such injuries" (World Health Organization, 2008: 33). By this definition, it is expected that all relevant information pertaining to the death must be recorded on the death notification form by the person responsible for certifying the causes of death. The World Health Assembly further recommended a form to be used for medical certification of death whereby the person responsible for certifying the causes of death is required to use his or her clinical judgement in completing the form (World Health Organization, 2008). The form makes provision for a number of causes to be recorded on the form. This form has since been adopted in South Africa.

For statistical purposes, every death is attributed to the underlying cause of death (Wilkins et al., 1997), which is a single disease, medical condition, or event considered to be responsible for death (Stallard, 2001). The underlying cause of death is selected from a number of conditions mentioned on the death notification form. Other diseases or conditions that are not selected as underlying causes of death are referred to as associated causes of death, while any disease or condition entered on the death notification form (underlying or associated) is referred to as a multiple cause (Frova et al., 2009).

While the analysis of causes of death generally focuses on the underlying cause of death, it is known that deaths rarely have only one cause (Redelings et al., 2007); the majority of deaths result from combinations of causes (Janssen, 1939). The analysis of only the underlying cause does not allow an assessment of the role of associated causes of death (Kitsantas, 2008; Redelings et al., 2007) and therefore provides a limited picture of the mortality and health of a population (Australian Bureau of Statistics, 2003). The analysis of cause of death can be greatly enriched when other causes mentioned on the death notification form are considered in addition to the underlying cause of death (Bah, 2003a). Furthermore, data on multiple causes of death are able to highlight diseases or conditions that are rarely indicated as the underlying cause of death but may have significantly contributed to the risk of death (Frova et al., 2009).

The importance of the analysis of multiple causes of death (where all conditions on the form are analysed) as another angle of understanding information on causes of death is well established (Broderick, 1955; Deshpande, 1997; Kitsantas, 2008; Redelings et al., 2006; Redelings et al., 2007). The analysis of multiple causes of death allows researchers to assess the role of conditions that were important contributors to a death but were not reported as the underlying cause (Redelings et al., 2007) and therefore provides a more complete picture of the pathological context surrounding the death (Istat, 2010).

The number of causes of death mentioned on a death notification may be used to determine the quality of information on causes of death, as it shows the circumstances of certification when the certifier has the ability to describe the morbid process more precisely (Vasconcelos, 2009). Differences in reporting the number of causes of death have been observed by country and within different countries: see, for example, Janssen (1939), Vasconcelos (2009), Wilkins et al. (1997), Desesquelles and Mesle (2001), Kitsantas (2008), Johnson and Christenson (1998), and Bah and Qutub (2010).

Multiple cause-of-death data have been used in the past to investigate associations and causality between causes (e.g. Redelings et al., 2007), to compare underlying causes and multiple causes of death (e.g. Redelings et al., 2006; Stallard, 2001), and for identifying and reporting injury mortality (Kreisfeld and Harrison, 2007). Frova and colleagues (2009) studied multiple causes of death for persons aged 70 and over using data from the Italian National Vital Statistics Death Registry, while Kitsantas (2008) compared underlying and multiple causes of death in preterm infants using the North Carolina linked birth/infant death files.

Bah (2003a) pioneered the analysis of multiple causes of death in South Africa using information from the death notification forms, focusing on the period 1997 to 2001. The author also prepared a paper on assessing the triple burden of HIV, TB, and pneumonia in South Africa using multiple-cause life table analysis for the same period (Bah, 2005). Overall, the author

highlighted the importance of studying this area of mortality and recommended further research on multiple causes of death for South Africa.

The purpose of this chapter is to contribute to the advancement of the study of causes of death in South Africa by exploring trends and patterns in the reporting of causes of death on death notification forms. This will entail discussing patterns of reporting the number of causes of death mentioned on death notification forms and establishing if reporting of the number of causes differs by characteristics available on the death notification form. Furthermore, the chapter aims to discuss trends in reporting multiple and underlying causes of death for the period 1997 to 2007. The chapter will also compare multiple causes to underlying causes of deaths.

2. DATA AND METHODS

2.1. Data Source

Data on mortality and causes of death in South Africa are derived from the national death notification system maintained by the Department of Home Affairs (DHA). Upon the occurrence of a death, the Births and Deaths Registration Act, No. 51 of 1992, stipulates that the death has to be registered at DHA as soon as practicable (Republic of South Africa, 1992).

A death notification form (Form BI-1663) is used to register deaths. It includes personal characteristics of the deceased and particulars of the informant as well as medical certification of the causes of death. The form makes provision for one or more causes of death to be recorded. The causes may be classified as immediate (final disease or condition resulting in death), associated (other causes leading to immediate cause of death), underlying (disease or injury that initiated events resulting in death), or contributing (other significant conditions contributing to death but not resulting in the underlying cause). "Multiple causes of death" refers to all conditions listed on a death notification form and will be used synonymously with mentioned causes in this chapter.

Once the registration process has been completed and death certificates issued, the death notification forms are collected by Statistics South Africa (Stats SA) for data processing. The information on causes of death is coded using the International Classification of Diseases, tenth revision (ICD-10), an international standard recommended by the World Health Organization (WHO). Details on data processing, including issues pertaining to ICD-10 coding, can be obtained from Stats SA (Stats SA, 2009). Reporting of information on causes of death uses the underlying cause of death, which Stats SA derives automatically using the Automated Classification of Medical Entities (ACME), a programme developed by the United States National Center for Health Statistics. ACME applies WHO rules on the selection of the underlying causes of death (WHO, 2010).

This chapter focuses on deaths registered at DHA during the period 1997 to 2007, with a total of 5,382,782 deaths registered during this period. Variables of interest include personal characteristics of the deceased (age, sex, population group, province of death, and year of death), institutional characteristics (institution where death occurred, method used to ascertain cause of death, and availability of certifier's registration number), and main group of the underlying cause of death. All classifications of the causes of death (immediate, associated, underlying, and contributing) are also included as multiple causes of death.

2.2. Data Analysis

Data analysis is undertaken in two main subsections: (i) number of causes and (ii) multiple and underlying causes of death. For the analysis of multiple causes, descriptive and multivariate analyses are employed to analyse the number of causes of death and associated factors available on the death notification form. Specifically:

(i) The average number of causes per death notification form by selected variables. This is based on the total number of causes of death on the death notification form in each category divided by the number of deaths in the same category.
(ii) Percentage distribution of deaths, reporting multiple causes by selected variables on the death notification form. The numbers of causes of death are grouped into two categories (one cause mentioned and two to five causes mentioned). Those with two or more causes on each form are regarded as having had multiple causes.
(iii) In order to examine the association between each variable and the response variable (having one cause versus having multiple causes), logistic regression is used to mutually adjust each factor for the others. Odds ratios and their 95% confidence intervals (CIs) are presented.

For the analysis of multiple and underlying causes of death, descriptive analysis is used to analyse trends for 1999, 2003, and 2007. Two specific analyses are undertaken:

(i) Ranking and selecting the ten leading underlying and multiple (mentioned) causes of death and their corresponding proportions, which allows for the comparison of reporting causes over time.
(ii) Ratios of multiple to underlying causes of death (dividing the number of deaths with any mention of the causes by the number of deaths for which the cause was the underlying cause). The ratios can be used to identify which diseases are relatively more important as multiple rather than as underlying causes (Australian Bureau of Statistics, 2003).

3. RESULTS

The results are presented in two sections, first focusing on the number of causes recorded on the death notification form, including factors associated with reporting multiple causes of death. The second focus is on the trends in underlying, multiple, and single causes of death and the ratio of multiple to underlying causes of death.

3.1. Number of Causes of Death

Table 6.1 shows the distribution of deaths by year of death, average number of causes of death, and the percentage of death notification forms with two or more causes (multiple causes). A total of 5,382,782 deaths that occurred between 1997 and 2007 were registered at the Department of Home Affairs. The number of deaths increased consistently between 1999 and 2006 and decreased in 2007.

The number of causes of death recorded on the death notification form (DNF) ranged from one cause to five causes, with an average of between

Table 6.1 Distribution of deaths by main groups of the underlying causes of death; average number of causes per form; percentage of deaths with multiple causes; and odds ratios of reporting multiple causes of death and their 95% confidence intervals (CI)

Variables	Number of deaths	Average number of causes	% with two or more causes	Odds ratios	95% CI for odd ratios	
					Lower Bound	Upper Bound
	5,382,782	1.6	40.9			
Causes of death						
Certain infectious and parasitic diseases	1,147,579	1.8	53.1	1.00	—	—
Neoplasms	353,933	1.8	51.5	0.63	0.63	0.64
Diseases of the blood and immune mechanism	163,384	2.2	81.9	4.07	4.01	4.12
Endocrine, nutritional, and metabolic diseases	248,390	2.3	78.3	2.55	2.52	2.58
Mental and behavioural disorders	18,947	2.3	79.8	2.82	2.72	2.92

(*Continued*)

Table 6.1 (Continued)

Variables	Number of deaths	Average number of causes	% with two or more causes	Odds ratios	95% CI for odd ratios	
					Lower Bound	Upper Bound
Diseases of the nervous system	130,327	1.6	42.2	0.58	0.57	0.58
Diseases of the eye and adnexa	337	2.1	69.7	2.01	1.58	2.55
Diseases of the ear and mastoid process	955	2.3	84.9	5.21	4.35	6.24
Diseases of the circulatory system	817,733	1.6	45.9	0.61	0.60	0.61
Diseases of the respiratory system	669,574	1.4	31.3	0.40	0.39	0.40
Diseases of the digestive system	148,760	1.7	49.7	0.79	0.78	0.80
Diseases of the skin and subcutaneous tissue	13,357	2.1	78.0	2.77	2.66	2.89
Diseases of the musculoskeletal system	19,249	2.1	67.8	1.84	1.78	1.89
Diseases of the genitourinary system	73,881	1.7	51.4	0.72	0.71	0.73
Pregnancy, childbirth, and puerperium	11,026	1.9	61.7	1.52	1.46	1.58
Perinatal conditions	271,265	1.6	43.2	0.52	0.51	0.52
Congenital malformations	19,786	2.3	76.6	1.97	1.90	2.04
Symptoms and signs not elsewhere classified	691,606	1.1	11.4	0.13	0.13	0.13
External causes of morbidity and mortality	581,572	1.2	11.7	0.16	0.16	0.17

one and two causes per DNF during the entire period (1.6 causes recorded per DNF). Between 1997 and 1999, there were about 1.7 causes per form, which declined slightly to about 1.6 causes per form afterwards. Overall, fewer than half (40.9%) had two or more causes of death mentioned on the forms, indicating that the majority of forms (59.1%) had only one cause of death recorded. These percentages were more or less the same when classified by year of death. This indicates that there was minimal change in recording the number of causes of death over time.

Further, Table 6.1, as well as Tables 6.2 and 6.3, provides odds ratios of deaths with multiple causes based on the results of logistic regression analysis and the corresponding 95% confidence intervals. The odds ratios are mutually adjusted for all variables in all tables. However, caution needs to be exercised in the interpretation of the results for the institution where death took place, method used to ascertain the causes of death, and population group due to a large proportion (more than 20%) of unknown or unspecified cases for each of these variables.

3.1.1. Individual Characteristics

Our analysis indicates that reporting multiple causes remained more or less the same between 2001 and 2007, when around 40% of death notification forms during this period had multiple causes recorded. A slightly higher percentage (between 43% and 45%) of forms in the earlier years (1997 to 2000) had multiple causes recorded. Controlling for other variables, the results show that the odds of reporting multiple causes were significantly lower for all years as compared to deaths that occurred in 1997, with the exception of deaths occurring in 1999, when the odds of reporting multiple causes were about 9% higher than in 1997 and significantly higher than the other years. This is an indication that multiple causes were reported significantly more in 1999 than any other years.

It is also observed that those who died in Western Cape had the highest percentage of multiple causes recorded on their DNFs (49.9%), while those who died in Limpopo and deaths that occurred outside the country had the lowest (33.2% and 27.7%, respectively). On average, Western Cape reported nearly two causes (1.8) per death notification, which was an average of about 0.4 more causes of death per death notification form than Limpopo. The odds ratios indicate that all provinces had a significantly lower chance of reporting multiple then Western Cape. Deaths that occurred in Limpopo were about 40% less likely to have had multiple causes than those that occurred in Western Cape.

Differences by age show that people aged 15 to 49 had the lowest percentage (36.2%) of recording multiple causes than other ages, with an average of 1.5 causes per death notification form. Those aged 65 and older had the highest percentage (46.3%) of reporting multiple causes, with an average of 1.7 causes per form. The results of logistic regression confirm that those aged 65 and older were significantly more likely to have had multiple

causes of death recorded than all other ages. They were 7% more likely to report multiple causes than those aged 0 to 14, while those aged 15 to 49 were about 30% less likely to report multiple causes than those aged 0 to 14.

With regard to the sex of the deceased, it was observed that slightly more female than male deaths had multiple causes of death recorded, although the average number of causes per death notification form appears to be the same. Female deaths were 5% more likely to have had multiple causes of death recorded than male deaths.

The table also provides variation of reporting multiple causes by population group of the deceased. White and Indian/Asian people who died had more causes of death recorded on their death notification forms than the Black African and Coloured population groups. More than half the White and Indian/Asian population groups (57.5% and 57.3%, respectively) had multiple causes of death recorded on the death notification form compared to 47.1% and 38.2% for the Coloured population group and Black Africans, respectively. The odds ratios indicate that all population groups were significantly more likely to report multiple causes than the Black African population group. Indians or Asians were nearly twice as likely to report multiple causes as the Black Africans, while the White and Coloured population groups were 89% and 29%, respectively, more likely to report multiple causes than the Black African population group.

3.1.2. Institutional Characteristics

The results on the number of causes of death show variations by institutional characteristics. It is observed that more than half the deaths that occurred in hospitals and those that occurred in nursing homes had more than one cause of death recorded, with an average of 1.8 causes of death per notification form for each institution. Conversely, those who died at home and those who were dead on arrival at hospitals had a significantly lower percentage of recording multiple causes of death, with a mean of about 1.4 causes of death per form. The odds ratios show that controlling for other variables, those who did not die in hospitals had a lower probability of reporting multiple causes than those who died in hospitals.

Only 11.8 % of deaths where the cause of death was ascertained through an autopsy had multiple causes of death. About a quarter (25.7%) of those where the cause was ascertained through an interview with family members had multiple causes, while the majority (52.4%) of those ascertained through the opinion of medical personnel (attending medical practitioner, attending medical practitioner on duty, or registered professional nurse) had multiple causes. The average number of causes per death notification form was 1.8 for deaths where the causes of death were ascertained by medical personnel. The odds ratios indicate that death notification forms where the cause was ascertained by the opinion of attending medical personnel were more than twice as likely to report multiple causes of death as were

those ascertained by autopsy and more than 50% more likely to report multiple causes as were those ascertained through interviews with family members.

Availability of certifier's medical registration number indicates whether the registration number of the certifying official was provided on the death notification form when the death was certified. As many as 44.5% of death notification forms with the certifier's registration number reported multiple causes compared to 31.7% of those who had not written their registration numbers on the forms. Death notification forms with registration numbers were about 11% more likely to record multiple causes than those without them.

3.1.3. Main Groups of Causes of Death

The distribution of the number of causes mentioned on the DNFs by the underlying causes of death, focusing on the main groups, is also shown in Table 6.1. About one in ten death notification forms where the underlying cause of death was given as symptoms and signs not elsewhere classified (11.4%) and external causes of morbidity and mortality (11.7%) had multiple causes of death recorded on the form, with a mean of about one cause per death notification form. Conversely, more than three quarters of death notification forms where diseases of the blood and immune mechanism (81.9%), endocrine, nutritional, and metabolic diseases (78.3), mental and behavioural disorders (79.8%), diseases of the ear and mastoid process (84.9%), diseases of the skin and subcutaneous tissue (78.0%), and congenital malformations (76.6%) were the underlying main groups of causes death mentioned multiple causes of death. All these causes had a mean of more than two causes per death notification form. Certain infectious and parasitic diseases, which had caused more deaths than other causes, had caused 53% of deaths, with two or more causes of death, with a mean of 1.8 deaths per form.

Controlling for other variables, diseases of the blood and immune mechanism and diseases of the ear and mastoid process were four times more likely to report multiple causes than certain infectious and parasitic diseases and had significantly higher chances of being reported as multiple causes than all other causes. Mental and behavioural disorders, diseases of the nervous system, diseases of the eye and adnexa, and diseases of the skin and subcutaneous tissue were more than twice as likely to report multiple causes compared to certain infectious and parasitic infections.

Last, even after controlling for other variables, symptoms and signs not elsewhere classified and external causes of morbidity and mortality had significantly lower chances of reporting multiple causes than certain infectious and parasitic diseases. They were also less likely to report multiple causes than all other causes, as their 95% confidence intervals did not overlap with any cause.

3.2. Multiple and Underlying Causes of Death

This section provides the results based on trends focusing on the ten leading multiple and underlying causes of death for 1999, 2003, and 2007. It considers natural deaths occurring in individuals who died after reaching their first birthday. Infant deaths and nonnatural deaths are excluded due to changes in coding methodology undertaken in 2006 and 2007. The results are presented in Tables 6.2, 6.3, and 6.4. Table 6.5 provides ratios of multiple causes to underlying causes for common causes of death in 1999, 2003, and 2007.

3.2.1. Broad Groups of Multiple Causes of Death

Information on the ten leading multiple causes of death is presented in Table 6.2. Multiple causes reflect the number of times a specific cause was mentioned on the death notification form, as either an underlying, immediate, contributing, or associated cause of death. The table shows that seven multiple causes were common for the three years under consideration, though with differing ranks and contribution of each cause to the overall number of deaths. Furthermore, the table raises some concerns about the quality of data on causes of death. It shows that ill-defined and unknown causes of mortality and general symptoms and signs were among the ten most commonly mentioned causes of death. Ill-defined and unknown causes of mortality were the second most commonly mentioned causes in 1999 and 2007 and the third most common in 2003.

Tuberculosis was the most commonly mentioned cause of death in 2003 and 2007, mentioned in 16.2% of death notification forms in 2003 and 17.4% in 2007. It ranked third in 1999 at 13.2% of all deaths. Certain disorders involving the immune mechanism comprised the eighth most commonly mentioned causes of death in 2003 and 2007. The number of times this cause was mentioned increased by 11.5% between 2003 and 2007. Diseases of the respiratory system that were mentioned most were influenza and pneumonia, chronic lower respiratory diseases, and other diseases of the respiratory system. Influenza and pneumonia comprised the second most commonly mentioned cause of death in 2003, third in 2007, and fourth in 1999.

Some forms of heart disease were mentioned more than any other cause of death in 1999, stated on 17.7% of death notification forms. This cause was the fourth most commonly mentioned cause in 2003 and 2007, stated on about 11% of death notification forms each year. Other diseases of the circulatory system that were mentioned more frequently were cerebrovascular disease, hypertensive diseases, and ischaemic heart diseases. For the three years under study, cerebrovascular disease and hypertensive diseases were the fifth and sixth most commonly mentioned causes of death, respectively.

Diabetes mellitus was also among the ten most commonly mentioned causes of death in 1999, 2003, and 2007. It was the tenth most commonly mentioned cause of death in 1999 and ninth in 2007 but was not among the most commonly mentioned causes in 2003.

Table 6.2 The 10 leading multiple causes[1] of death by year of death: 1999, 2003, and 2007

Broad groups of causes of death, based on the 10th revision, International Classification of Diseases, 1992	1999			2003			2007		
	Rank	Deaths	%	Rank	Deaths	%	Rank	Deaths	%
Other forms of heart disease (I30–I52)	1	52,757	17.7	4	52,861	11.4	4	54,083	10.8
Ill-defined and unknown causes of mortality (R95–R99)	2	40,394	13.5	3	61,060	13.2	2	73,595	14.7
Tuberculosis (A15–A19)	3	39,450	13.2	1	75,247	16.2	1	87,348	17.4
Influenza and pneumonia (J10–J18)	4	37,993	12.7	2	71,795	15.5	3	69,818	13.9
Cerebrovascular diseases (I60–I69)	5	27,740	9.3	5	36,489	7.9	5	34,361	6.9
Hypertensive diseases (I10–I15)	6	24,820	8.3	6	31,651	6.8	6	33,755	6.7
Chronic lower respiratory diseases (J40–J47)	7	18,146	6.1	10	21,924	4.7	10	20,637	4.1
General symptoms and signs (R50–R69)	8	17,926	6.0	9	24,323	5.2	. . .	. . .	. . .
Ischaemic heart diseases (I20–I25)	9	16,709	5.6	. . .	. . .	. . .	. . .	. . .	. . .
Diabetes mellitus (E10–E14)	10	14,159	4.7	. . .	. . .	. . .	9	22,133	4.4
Certain disorders involving the immune mechanism (D80–D89)	. . .	. . .	. . .	8	24,510	5.3	8	27,338	5.5
Intestinal infectious diseases (A00–A09)	. . .	. . .	. . .	7	27,315	5.9	7	31,576	6.3
All deaths		**298,456**			**463,924**			**500,743**	

[1]Multiple causes refer to all morbid conditions, diseases, and injuries entered on the death certificates. These include those involved in the morbid train of events leading to the death which were classified as either the underlying cause, the intermediate cause, or any intervening cause and those conditions which contributed to death but were not related to the disease or condition causing death (WHO, 1993).

. . . Denotes that the broad group of causes of death was not among the 10 leading multiple causes in that particular year.

3.2.2. Broad Groups of Underlying Causes of Death

The ten leading underlying causes of death shown in Table 6.3 indicate that eight of the ten leading underlying causes were common over the three time periods selected, although they differed in ranks and in their contribution to the total number of deaths each year. In this case as well, there were high proportions of ill-defined and unknown causes of mortality, making them the leading underlying cause of death in 1999 and the second most common cause in 2003 and 2007. Nearly 15% of deaths in 2007 were due to ill-defined and unknown causes.

Excluding ill-defined and unknown causes of mortality, tuberculosis was the leading underlying cause of death for all three years, accounting for 11.4%, 14.6%, and 15.2% of deaths in 1999, 2003, and 2007, respectively. The absolute number of deaths due to tuberculosis almost doubled between 1999 and 2003 but increased by about 12% between 2003 and 2007.

Diseases of the respiratory system (influenza and pneumonia and chronic lower respiratory diseases) featured prominently over the three years. On the one hand, influenza and pneumonia was the third leading underlying cause of death in 2003 and 2007 and the fifth leading cause in 1999. On the other hand, chronic lower respiratory diseases were the eighth leading cause in 2003 and 2007 and the sixth leading cause in 1999. Certain disorders involving the immune mechanism was the ninth leading cause recorded during 2003 and 2009 but was not among the ten leading underlying causes of death in 1999. The number of deaths due to this cause increased by 3.3% between 2003 and 2007. It was responsible for around 3.0% of deaths in 2003 and 2007.

Other forms of heart disease, cerebrovascular disease, ischaemic heart disease, and hypertensive diseases were the third, fourth, eighth, and tenth leading underlying causes of death in 1999. By 2007, they were respectively the fifth, sixth, and tenth of other forms of heart disease, cerebrovascular disease, and hypertensive diseases. Ischaemic heart diseases ceased to be among the ten leading causes by 2007. These diseases of the circulatory system contributed at least 15% of all deaths each year.

Diabetes mellitus was the only cause of endocrine, nutritional, and metabolic diseases that appeared among the ten leading underlying causes of death in the three years and remained the seventh leading cause of death for all the years. It contributed 4.2% of deaths in 1999, 3.6% in 2003, and 4.0% in 2007. The number of deaths due to diabetes increased by 10.2% between 1999 and 2003 and by 19.6% between 2003 and 2007.

3.2.3. Comparison of Multiple (Mentioned) Causes to Underlying Causes

The results of the comparison of multiple causes to underlying causes are provided in Table 6.4, based on causes of death that were among the ten leading multiple and underlying causes of death. The results show the ratios of multiple causes to underlying causes of death for the years 1999, 2003,

Table 6.3 The 20 leading underlying causes[2] of death by year of death: 1999, 2003, and 2007

Broad groups of causes of death, based on the 10th revision, International Classification of Diseases, 1992	1999			2003			2007		
	Rank	Deaths	%	Rank	Deaths	%	Rank	Deaths	%
Ill-defined and unknown causes of mortality (R95–R99)	1	38,727	13.0	2	58,738	12.7	2	72,536	14.5
Tuberculosis (A15–A19)	2	33,990	11.4	1	67,615	14.6	1	75,878	15.2
Other forms of heart disease (I30–I52)	3	20,042	6.7	6	24,026	5.2	5	25,723	5.1
Cerebrovascular diseases (I60–I69)	4	19,897	6.7	4	27,483	5.9	6	25,260	5.0
Influenza and pneumonia (J10–J18)	5	19,037	6.4	3	45,389	9.8	3	42,838	8.6
Chronic lower respiratory diseases (J40–J47)	6	12,571	4.2	8	16,173	3.5	8	15,185	3.0
Diabetes mellitus (E10–E14)	7	12,531	4.2	7	16,811	3.6	7	20,112	4.0
Ischaemic heart diseases (I20–I25)	8	11,407	3.8	10	13,339	2.9	. . .	. . .	. . .
Intestinal infectious diseases (A00–A09)	9	11,082	3.7	5	24,381	5.3	4	27,775	5.5
Hypertensive diseases (I10–I15)	10	9,427	3.2	. . .	. . .	. . .	10	13,371	2.7
Certain disorders involving the immune mechanism (D80–D89)	. . .	. . .	. . .	9	14,003	3.0	9	14,473	2.9
All deaths		**298,456**			**463,924**			**500,743**	

[2]Underlying causes refer to the disease or injury that initiated the train of events leading directly to death; or the circumstances of the accident or violence which produced the fatal injury (WHO, 1993).

Table 6.4 Top 10 single causes of death by year of death: 1999, 2003, and 2007

Broad groups of causes of death, based on the 10th revision, International Classification of Diseases, 1992	1999			2003			2007		
	Rank	Deaths	%	Rank	Deaths	%	Rank	Deaths	%
Tuberculosis (A15–A19)	1	15,748	10.6	1	25,732	13.3	1	32,314	15.2
Cerebrovascular diseases (I60–I69)	2	12,081	8.2	3	14,033	7.2	5	12,020	5.7
Diabetes mellitus (E10–E14)	3	10,710	7.2	4	13,735	7.1	3	15,632	7.4
Human immunodeficiency virus [HIV] disease (B20–B24)	4	8,050	5.4	6	8,807	4.5	6	11,429	5.4
Chronic lower respiratory diseases (J40–J47)	5	7,577	5.1	7	8,449	4.4	8	7,700	3.6
Other forms of heart disease (I30–I52)	6	7,552	5.1	9	7,419	3.8	9	7,574	3.6
Intestinal infectious diseases (A00–A09)	7	7,406	5.0	2	14,359	7.4	2	16,045	7.6
Certain disorders involving the immune mechanism (D80–D89)	8	6,613	4.5	5	11,603	6.0	4	12,022	5.7
Ischaemic heart diseases (I20–I25)	9	6,539	4.4	10	6,750	3.5	. . .	. . .	. . .
Influenza and pneumonia (J10–J18)	10	4,953	3.3	8	8,441	4.3	10	6,972	3.3
Ill-defined and unknown causes of mortality (R95–R99)	. . .	. . .	. . .	. . .	. . .	. . .	7	9,572	4.5
Deaths with only one cause mentioned		**148,134**			**194,104**			**212,496**	

and 2007. The ratios show the relative frequency with which a cause of death is reported on the death notification forms compared with the number of times that cause is selected as the underlying cause of death (Israel et al., 1986). A ratio of 1.0 indicates that when the specific cause is mentioned on the form, it will certainly be the underlying cause of death, while higher ratios indicate that when the specific cause is mentioned, it is less likely to be the underlying cause of death.

For the selected causes indicated in Table 6.5, the ratios range from 1.0 to 4.9, although the majority have ratios of less than 2.0. It is further observed that there is not much difference in the ratios of specific causes over time, with the exception of influenza and pneumonia and general symptoms and signs. The ratios of influenza and pneumonia decreased between 1999 and 2003 but remained the same between 2003 and 2007, while the ratios of general symptoms and signs increased over time.

Where ill-defined and unknown causes of mortality were mentioned, they were also selected as the underlying causes of death, indicated with the ratio of 1.0. That is, the number of times it was mentioned was similar to the number of times it was selected as the underlying cause of death. Similarly, tuberculosis, diabetes mellitus, and intestinal infectious diseases were also mainly selected as underlying causes where they were mentioned. However, other forms of heart disease, hypertensive disease, and general symptoms and signs had caused more deaths than they would be indicated as the underlying cause of death. For example, hypertensive disease had about two and half times as many deaths as would be indicated by underlying cause of death data in each of the three years under study.

4. DISCUSSION

This chapter has addressed several issues pertaining to the reporting of causes of death in South Africa using information from the death notification system in the country. It has highlighted some trends and patterns observed over time, considering all deaths that occurred and were registered in South Africa between 1997 and 2007. The chapter has gone beyond conventional reporting of the underlying causes of death by exploring multiple causes of death.

The results show that the majority of forms had only one cause of death reported, with an average of about 1.6 deaths per death notification form and with minimal change in recording causes of death over time. The average number of causes provided per death notification form for the period 1997 to 2007 was about the same as that observed in the United States in the 1930s but much lower than that observed in other countries in the recent years. The percentage of deaths with more than one cause was 60% in the United States in 1955, increasing to about 75% in 1979 (Israel et al., 1986). The average number of deaths per death certificate was 3.6 in Brazil

Table 6.5 Comparison of multiple causes of death to underlying causes for selected causes of death

Causes of death, based on the 10th revision, International Classification of Diseases, 1992	1999			2003			2007		
	Mentioned	Under-lying	Ratio*	Mentioned	Under-lying	Ratio*	Mentioned	Under-lying	Ratio*
Other forms of heart disease (I30–I52)	52,757	20,042	2.6	52,861	24,026	2.2	54,083	25,723	2.1
Ill-defined and unknown causes of mortality (R95–R99)	40,394	38,727	1.0	61,060	58,738	1.0	73,595	72,536	1.0
Tuberculosis (A15–A19)	39,450	33,990	1.2	75,247	67,615	1.1	87,348	75,878	1.2
Influenza and pneumonia (J10–J18)	37,993	19,037	2.0	71,795	45,389	1.6	69,818	42,838	1.6
Cerebrovascular diseases (I60–I69)	27,740	19,897	1.4	36,489	27,483	1.3	34,361	25,260	1.4
Hypertensive diseases (I10–I15)	24,820	9,427	2.6	31,651	11,712	2.7	33,755	13,371	2.5
Chronic lower respiratory diseases (J40–J47)	18,146	12,571	1.4	21,924	16,173	1.4	20,637	15,185	1.4
General symptoms and signs (R50–R69)	17,926	5,766	3.1	24,323	6,603	3.7	18311	3737	4.9
Ischaemic heart diseases (I20–I25)	16,709	11,407	1.5	19013	13,339	1.4	18183	12,501	1.5
Diabetes mellitus (E10–E14)	14,159	12,531	1.1	18728	16,811	1.1	22,133	20,112	1.1
Certain disorders involving the immune mechanism (D80–D89)	13383	7693	1.7	24,510	14,003	1.8	27,338	14,473	1.9
Intestinal infectious diseases (A00–A09)	13010	11082	1.2	27,315	24,381	1.1	31,576	27,775	1.1

in 2005 (Vasconcelos, 2009) and 2.68 in Canada between 1990 and 1993 (Wilkins et al., 1997). These results show that limited information on causes of death is provided at the time of death in South Africa, particularly taking into consideration that the average number of deaths per death notification form has been fairly stable for the past ten years.

It has further been observed that reporting causes of death was associated with characteristics of the deceased, institutional variables, and specific causes of death. The results of the analyses undertaken in this chapter indicate that a higher proportion of reporting more causes of deaths was observed among females, the elderly, the White and Indian/Asian population groups, and those who died in Western Cape. For institutional variables, those who died in hospitals and nursing homes, where the death was ascertained by the opinion of attending medical personnel and where the certifier's registration number was available, had higher proportions of reporting multiple causes of death.

The fact that deaths occurring in hospitals and nursing homes had the highest percentage of reporting multiple causes of death in South Africa was also noted by Wall and colleagues (2005) based on information from Minnesota during 1990 to 1998. The authors argued that a death occurring in a hospital or nursing home would have multiple causes reported due to better documentation of the history of disease for the deceased, which would also be the case in South Africa. Similarly, Justice (2010) indicated that information about death is often missing if the death occurs at home or at a distant location.

The results further showed that a great majority of deaths that had had an autopsy performed had only one cause of death recorded, mainly R99 (other ill-defined and unspecified cause of mortality). This could probably mean that the results of the autopsy were not available at the time of registering the death; as such, the cause of death is provided as unknown, pending the results of an autopsy.

Other notable differences were the reporting of multiple causes based on population group, province of death, and causes of death; the differences by sex were not large, a finding confirmed by Wall and colleagues (2005). Racial differences showed that Black Africans had a relatively low percentage of multiple causes. Manton (1980) cited in Johnson and Christenson (1998) argued that observed differences in reporting of multiple causes of death in the United States may result from lower levels and quality of medical care among Blacks that, in turn, can lead to fewer diagnoses of causes of death being made on the death certificate, which is strongly believed to be the case in South Africa.

Differences were also observed by province of death, with multiple causes of death recorded more frequently in Western Cape, the province which also had the lowest mortality rate in the country. Deaths that occurred outside the country as well as those that occurred in Limpopo had the lowest proportion of multiple causes. Brody and colleagues (2007) had argued that

the quality of data in Western Cape was better than data for South Africa as a whole, based on the percentage of ill-defined natural causes, which was much lower in Western Cape than the national average.

The number of causes of death recorded on death notification forms also varied according to the particular conditions reported. External causes of morbidity and mortality, as well as symptoms and signs not elsewhere classified, had the lowest proportion of reporting multiple causes of death. The majority of deaths (94.4%) grouped under symptoms and signs not elsewhere classified in 2008 were ill-defined and unknown causes of mortality which only had one cause of death mentioned, mainly "natural cause" (Stats SA, 2010). This clearly indicates poor reporting of causes of death, which needs to be improved.

The prevalence of stating causes of death grouped as ill-defined and unknown causes of mortality for both underlying and multiple causes of death over time shows the inadequacy of death certification in South Africa. Bah and Rahman (2009) indicated that the percentage of ill-defined causes can be used as a general indicator of the quality of the data. This cause was among the three most commonly mentioned causes of death and was one of the two leading underlying causes for the years 1997, 2003, and 2007. In 2007, ill-defined causes represented 14.7% and 14.5% of multiple and underlying causes of death. Symptoms and signs not elsewhere classified had the lowest proportion of multiple causes of death reported, indicating that this cause was mentioned alone in many instances and therefore was most likely to be selected as the underlying cause.

Tuberculosis was identified as the main area of concern in the country as an underlying cause and as the most commonly mentioned cause of death in 2003 and 2007. The number of deaths due to tuberculosis increased consistently over the three years under study. The 2007 tuberculosis deaths also included those due to multidrug-resistant tuberculosis as well as those due to extensively drug-resistant tuberculosis, which are both increasing in the country (Stats SA, 2010).

The Department of Health (n.d.) noted that South Africa is one of the twenty-two high-burden countries that contribute approximately 80% of the total global burden of all tuberculosis cases and that South Africa has the seventh highest incidence of tuberculosis. The report further stated that the Minister of Health had declared tuberculosis to be a national crisis in 2005. From the results, it is clear that South Africa is still far from being free of tuberculosis and that more efforts need to be made to reduce the incidence and death rates associated with tuberculosis. This also means addressing causes of death associated with tuberculosis such as certain disorders involving the immune mechanism, other viral diseases, and HIV disease, which were the causes most commonly mentioned with tuberculosis in 2007.

Influenza and pneumonia represented the second leading underlying and multiple causes of death (excluding ill-defined and unknown causes

of mortality) in 2003 and 2007 and the third and fourth leading multiple and underlying cause in 1999, respectively. South Africa has realised the impact of pneumonia and taken steps to reduce it by being the first African nation to provide free routine access to the pneumococcal vaccine among children in 2009 (Klugman, 2009). It is important that programmes are also put in place to reduce deaths associated with influenza and pneumonia among adults.

HIV disease was not among the ten leading multiple or underlying causes of death for the subset of the deaths studied. Some researchers have noted that HIV is often underreported as a cause of death. Underreporting of HIV/AIDS cases is a common problem in HIV epidemiology (Hsieh et al., 2005; Nojilana et al., 2009; OSSREA, 2008; Pacheco et al., 2010; Yudkin 2009). For example, Nojilana and colleagues (2009) assessed the quality of death certification at an academic hospital in Cape Town, South Africa. Their results showed extensive underreporting of HIV as the underlying cause of death, which they believed resulted from concerns about confidentiality of the information on the death notification forms. In addition, Yudkin and colleagues (2009) indicated that modelling of trends in age-specific death rates in South Africa suggested that deaths attributable to HIV are often misclassified on death notification forms. Pacheco and colleagues (2010) cited the lack of information on HIV status in a patient who dies in an emergency room, physicians filling in the certificate considering that the death was unrelated to HIV/AIDS, and the stigma related to HIV as reasons for not listing HIV/AIDS on the death certificate.

The role of chronic illnesses in mortality was also observed from the trends in underlying and multiple causes of death. Other forms of heart disease (mainly heart failure), cerebrovascular disease, and hypertensive diseases were among the ten leading multiple causes of death in 1999, 2003, and 2007, while other forms of heart disease, cerebrovascular disease, and diabetes mellitus were among the ten leading underlying causes during the same period. Other forms of heart disease, specifically, are a cause of death that is highly underrepresented by studying underlying causes of death only. This is because it is not selected as an underlying cause in more than half the cases in which it has been mentioned. In 2007, this disease was the fifth leading underlying cause of death, with 25,723 deaths, but was the fourth leading multiple cause of death during the same year, accounting for 54,083 deaths.

Large ratios usually indicate serious chronic conditions that are likely to be of long duration or causes that can be complications of other diseases (Israel et al., 1986). The results obtained for diabetes mellitus, therefore, were not expected, given that it is a chronic condition but had a ratio of 1.1, indicating that where it was mentioned, it was frequently selected as the underlying cause. This could have resulted from the fact that it was among the leading causes with only cause of death mentioned; therefore, where it was mentioned, it was also selected as the underlying cause.

Diabetes mellitus was found to have higher ratios (greater than 3) elsewhere (e.g. Australian Bureau of Statistics, 2003; Israel et al., 1986). The results of higher ratios obtained for hypertensive disease, other forms of heart disease, and influenza and pneumonia were as expected, as hypertensive disease and other forms of heart disease are chronic conditions, while influenza and pneumonia occur frequently as the immediate causes of death, complicated by other diseases.

Although differences were observed over time, it is important to note that the changes observed may result from changes in death registration, changes in certifying the causes of death by medical professionals, and changes in the patterns of diseases. For the analyses undertaken in this chapter, all cases in which some changes were made in coding over time were excluded (i.e. nonnatural causes and infant deaths). This was a limitation for this chapter, as an understanding of nonnatural causes as well as infant deaths would have been important for the analysis of multiple causes of death.

The information on mortality and causes of death is subject to coverage and content errors. Stats SA (2009) estimated that the completeness of death registration for 2007 deaths was 86% for males and 79% for females, with a national average of 83%. Another problem pertains to the completeness of the information on personal details of the deceased on the form. Variables such as the population group, its levels of education, and place of death were not completed fully and accurately on the death notification forms. Completeness of information on the death notification forms remains a problem and has not improved much over time. It is hoped that the findings presented in this chapter will go a long way towards identifying areas of improvement in the civil registration system, particularly relating to the quality of data on causes of death. Furthermore, it is envisaged that the findings will be used for informing policies and programmes aimed at general improvements in the health status of the population.

5. CONCLUSION

This chapter has highlighted the importance of multiple causes of death statistics in South Africa. However, the validity and reliability of the information provided through the civil registration system need to be examined, particularly given the fact that not all deaths in the country are registered. It would be important to compare these statistics with those obtained from medical records and possibly through verbal autopsy. Like all data, data from death notification are not perfect (Redelings et al., 2007), and it is important to understand their limitations before conclusions are drawn. Death certification has been identified as the main area of improvement needed in the collection and analysis of information on mortality and causes of death in South Africa, and plans are underway to train certifiers to complete death notification forms correctly.

The quality of data on multiple causes of death is highly dependent on the contribution that doctors and certifiers make in completing the death notification form (Australian Bureau of Statistics, 2003). Certifiers vary in terms of whether they mention other conditions (Mackenbach, 1995). However, "no evidence on problems of quality of the data or on inadequacy of the information to identify significant health deficits and their correlates can override the unique characteristics of mortality statistics" (Shapiro, 1977, cited in Kleinman, 1982), and "mortality data have rarely misled us" (Israel et al., 1986). Further research is recommended regarding specific concerns about the accuracy of reporting causes of death.

In addition, future analyses on causes of death in South Africa should start to shift the emphasis from reporting only on the underlying causes of death to statistics on multiple causes to complement underlying causes of death, as has been recommended elsewhere (e.g. Israel et al., 1986). This is particularly important in this country, where a relatively large number of deaths are due to chronic conditions (e.g. other forms of heart disease, hypertensive diseases), which due to their common etiologies and protracted course often occur jointly (Mackenbach et al., 1995). However, improving the quality of death certification through training medical practitioners is a priority area in South Africa, as has been identified by others (e.g. Akinnusi and Molosi, 2008; Bah, 2003b; Bradshaw et al., 2006).

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7 Migration, Urbanisation, and Development in South Africa

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1. INTRODUCTION

The weakening of various segregation laws in South Africa, such as the Group Areas Act No. 41 and Bantu Resettlement Act of 1954 in the late 1980s, and their eventual repeal in 1990 ushered in great rural-urban movements in the country (Gelderblom and Kok, 1994; see Wentzel and Tlabela, 2006 for a discussion on the effects of these laws on internal migration in the country). These large-scale movements, together with others from the neighbouring countries, were unprecedented in the history of South Africa, thus raising considerable investigations and analysis among academics and policy makers. It is therefore not surprising that much work on migration in the country after the apartheid era has been done on patterns of movement (Cross, 2006; Posel, 2006; Wentzel et al., 2006) and their causes (De Jong and Steinmetz, 2006); there has also been some comparative analysis of these patterns and those encountered in other developing countries (Anderson, 2006; Massey, 2006; Oucho, 2006). Comparatively, much less has been done on the impact of migration on the living and working conditions of migrants and their households except for some significant work on migration and health (Collinson, Tollman, et al., 2006; Garenne, 2006; Roux and van Tonder, 2006) and a very small amount on socioeconomic status (Collinson, Laurie, et al., 2006). In recent years, some studies have also been done on the relationship between migration and service delivery and xenophobia as a response to public unrest on these issues in 2009. Thus, apart from the works of Collinson and colleagues, we do not have much about the effects of migration on those who are left behind, especially in the rural areas. Typical of most developing nations, rural areas lack well-functioning markets. Hence, migration can play a major role in the accumulation of assets through the flow of remittances. In the short run, rural households may use migrant remittances to supplement income in order to increase consumption, but in the long run, remittances can be used as an integral part of the household's development strategy, especially as most migrants in the rural areas are circular. From the literature, it is clear that the influx of rural-urban migrants just before and after independence is a clear response

to years of imbalance in the socioeconomic development between urban and rural areas. A study like this can perhaps determine whether some of these imbalances can be reduced through migration and remittances.

2. THEORETICAL AND EMPIRICAL LITERATURE

The relationship between migration and the development of origin communities has been studied comprehensively. While some see the relationship as mostly leading to negative outcomes in terms of a so-called brain drain, others see it as bringing significant socioeconomic improvement to the sending households and communities. But whether migration has any positive impact on development sometimes depends on the theoretical foundations one is using, as well as the definition of development indicators. For example, the structural approach to the study of the impact of migration is rather pessimistic. One such perspective is the cumulative causation theory. In this theory, "each act of migration alters the social context within which subsequent migration decisions are made." The social contexts that migration alters in any society include income distribution, land distribution, distribution of human capital, and organisation of agriculture and the general culture of the society (Massey et al., 1993). In all these socioeconomic fabrics, migration is seen as contributing to the creation of inequalities between the haves and have-nots. In the sending communities, for example, migration is said to lead to unequal distribution of income, as migrant households have higher absolute income and are able to purchase better land than their nonmigrant counterparts (ibid.). Empirical work attesting to this school of thought shows that in rural South Africa, migration has led to some fragmentation of families, leaving women and children to take up traditional male duties (Wentzel and Tlabela, 2006). A good number of migrants return home with diseases, only to die in the caring hands of their family members who were left behind, as evidenced in the rural Agincourt Health and Demographic Surveillance System (Clark et al., 2007, cited in Stats SA, 2006b).

It is the new economics of labour migration (NELM) theory that really shows the sending community as an integral part of development outcomes of migration processes. In NELM and network theories, migration is viewed as a household strategy focused not so much on the maximisation of income but as a way of diversifying sources of income in order to minimise risks such as unemployment, losses of income, and crop failure (Massey et al., 1993). The strength of the NELM theory is its placement of migration in the broader community context, especially associating a household's decision concerning migration to its relative position within the income distribution of the community (Mahmud et al., 2009). Thus, unlike cumulative causation theory, NELM positively views migration as part of a broader household livelihood strategy to diversify income and overcome

development constraints such as a weak financial market in the community. But some concerns have been raised about the long-term sustainability of remittance flows, providing a reason for pessimists to refute any developmental role played by migration (Klink, 2008). But transnationalism has dispelled this doubt, with empirical evidence indicating that migrants do maintain strong transnational ties over sustained periods and that these ties can even become transgenerational (O'Neil, 2003). What propels these interactions is a set of interpersonal ties that connect migrants, former migrants, and nonmigrants in origin and destination areas through kinship, friendship, and a shared sense of community of origin (Massey et al., 1993). An implication is that households would engage in migration not only to raise money for investment at home but also to have other sources of income as a precautionary motive. Contributions which migration and remittance have made and continue to make in the socioeconomic development of households and national economies of sending nations are well documented (Adams, 2005; Collinson, Laurie, et al., 2006; De Brauw and Rozelle, 2008). As rural areas usually have undeveloped capital markets, migration with remittance has become an additional source of funds for asset accumulation and other investment, especially if the migrant intends to return to the village.

But there are still some debates regarding the impact of migration on investment. Much of this debate centres on whether remittances from migrants are spent on productive or consumptive resources. Some studies, especially in the earlier literature, describe both senders (migrants) and recipients (migrant households) as spending the proceeds of migration on consumption assets. For example, according to Mines and de Chami (2005, cited in Brauw and Rozelle, 2008), migrants in Mexico do not spend their money on productive resources in the villages; they rather view the village as a place to raise their children and rest. Also, Chami and colleagues (2005) and Durand and colleagues (1996) have found that migrant households in rural Northeast Thailand and Mexico, respectively, spend remittances on consumption items such as education, clothing, and building materials from the urban centres. This pattern has also been found in Ghana by Manuh (2001) and Mazzucato (2009); also in rural China by Chami and colleagues (2005). In rural South Africa, Collinson, Laurie, and colleagues (2006) and Kuhn (2003) have also shown a good positive relationship between circular migration and the socioeconomic status of sending communities in the Agincourt Demographic Surveillance site catchment area as measured by purchases of household consumer durable goods. That is, in addition to contributing to household income, migration links village households to new markets, societies, and cultures in the urban centres, and this linkage modifies their consumption patterns (Taylor and Mora, 2006).

In addition to being used for consumption expenditure, other studies have found that migration and remittances have had positive effects on

investment expenditure in rural areas (Adams, 2006; Taylor and Mora, 2006). Taylor (2006) attributes the findings that remittances are spent on consumption expenditure to a lack of appropriate models in earlier studies. According to him, those findings are "more a result of modelling and data limitations than actual differences in expenditure patterns between migrant and non-migrant households" (ibid.). The problem could perhaps lie more with the definition of investment and consumption expenditures than analytic models, notwithstanding the importance of using appropriate models as suggested by Taylor and Adams. The definition of investment expenditure, comprising health, education, and housing as used by Taylor and Mora, is, however, used by Brauw and Rozelle (2008) as consumptive expenditure. For the latter, investment expenditure consists of expenditure on agricultural and nonagricultural businesses that enhance the rural households' income-earning potential. Obviously, one could argue that investment in education and health can also enhance earning potential, albeit in the long term. There is not much room for this debate in this chapter. In any case, relaxing the concept of "investment," we can see that all these authors are in agreement that remittances are mostly spent on education, food, health, and housing. This perhaps demonstrates that a positive impact of remittance and/or migration on productive investments such as business and savings in the rural areas is quite scarce. Woodruff and Zenteno (2007, cited in Brauw and Rozelle, 2008) estimate that 20% of capital invested in microenterprises in Mexico comes from remittances, while the presence of remittance has been found to increase aggregate levels of deposits and credits in developing countries (Aggarwal et al., 2006).

Without formal sources of liquidity, households in rural South Africa might turn to migration to create income that could be used to finance their small business investments. Banks play an important role in this process, since they can offer financial services other than transfers, enabling rural households to make use of them to receive the transfers. Even with investment opportunities, households may be so poor that they could choose to use remittances for more immediate needs, such as food, clothing, and educational fees. If so, there would be less of a link between migration and investment.

This chapter investigates the impact of migration on two developmental indicators in rural South Africa. Specifically, we want to establish whether migration or remittance flows have any positive impact on savings behaviour and small household business investment. We can hypothesize that (1) having a migrant and receiving remittance have positive impacts on rural household savings and small business investment behaviour; (2) receiving other remittance but with no migrant can also have a positive impact on rural household savings and small business investment behaviour but less impact than the effects of (1); and (3) having a migrant but no remittance has a positive impact on rural household savings and small business investment behaviour but less impact than (2). Simply put, the magnitude of impact of

migration and/or remittance on the savings and business investment behaviour of rural households is hypothesized to have the following order:

(1) > (2) > (3)

where (1), (2), and (3) are as defined.

3. DATA AND ANALYTICAL CONCERNS

3.1. Data

The chapter makes use of data from Labour Force Surveys (LFS) of 2003.[1] There are more recent rounds of LFS, but the one of March 2003 is chosen for two reasons. It provides clear information on household and migrant characteristics as well as household savings and business investments. Most importantly, the 2003 LFS is the only survey for which the sampling procedure takes into account the stratification of units (households) not only in terms of province but also of rural (nonurban) and urban divisions (Stats SA, 2003). It therefore presents a good case for the generalisation of the results.

3.2. Measures of Key Variables

There has always been some difficulty concerning what constitutes rural areas in South African geopolitical discussions. The use of *de jure* requirements to define and divide settlement types in the country into only two groups—urban and rural—generated considerable criticism in the country (Gelderblom and Kok, 1994; Graaf 1986). Consequently, in the 1996 census, an attempt was made to introduce a semi-urban category in the settlement types. Other categories such as metropolitan formal, other urban formal, urban informal, former homeland, and commercial agriculture have been introduced (Stats SA, 2006a). Apart from making analyses rather more cumbersome, the criteria used for these categories are yet to be streamlined or standardised. For LFS 2003, urban and nonurban geographical categories were used for the stratification of the sample. This division was dropped in subsequent surveys but reintroduced in recent surveys such as the LFS 2010. For the purpose of simplicity and consistency, in this study, the nonurban categories are all classified as rural settlements.

Official emigration data have not been able to give us a clear picture of the number of South Africans emigrating from the country (Cross, 2009); hence, the measurement of remittances is limited to internal migrants. Even from this survey, remittance is reported only as the main source of income. This implies that other remittance-receiving households would not be classified as such if income from other sources is higher. The data present a smaller sample of remittance-receiving households than it would otherwise have been. On a positive note, though, with remittance reported as the main

source of income, the effects of fungibility of income from other sources on the outcome variables (savings and small business) would be minimal. Migrant households are households that report at least one migrant worker.

Different types of capital accumulation are measured by the survey. These include money in savings accounts, savings in stokvels,[2] unit trusts, stocks or shares, life insurance, and other savings such as in-house structures. A household is classified as having savings if it has at least one of these forms of savings (1) and (0) if it does not. Household business ownership is measured by a report of at least the presence of the following as the main work within the household: if a household member works on his/her own or on a small household farm or plot; or works on his/her own or with a partner in any type of business and/or is helping without pay in a household business. A household is classified as (1) if it has at least one business or farm of its own and (0) otherwise.

3.3. Self-Selection and Endogeneity

It is not clear, *a priori*, whether differences in savings and household business investment behaviour between migrant and nonmigrant households are due to migration or to these differences in income and other variables. While migration may trigger savings and investment, the reverse could also be true, as households can embark on further migration with the proceeds of investment. Migration has to be seen as an integral part of a socioeconomic development process, not independent variables causing some effect ("impact") on development (De Haas, 2010). Migration and development should be viewed as endogenous and not just exogenous variables to microeconomic developmental processes.

Characteristics which explain decisions to migrate may also shape household wealth, education, and health care choices and so forth. These issues make it difficult to effectively measure causal links between decisions on migration and its effect on other outcomes such as those under investigation here. The problem of self-selection may occur because the pool of either migrants or remittances in recipient households is not a random sample. Migrant families may systematically differ from those of the nonmigrants in several observable (e.g. age, education, marital status) and unobservable preferences and characteristics (e.g. income shocks, ability, talent, risk aversion). For example, selection problems would arise when migrant families have more entrepreneurial spirit, less risk aversion. In this case, migrant families may be investing more than nonmigrant ones. This problem of selectivity leads to a bias in a typical reduced-form regression framework. To eliminate or reduce this problem, applications like matching techniques (such as propensity score matching defined by Rosenbaum and Rubin (1983) and selection methods such as the Heckman (1979) selection model are applied to correct for the effects of possible selection bias.

Reverse causality is another challenge one has to deal with whenever attempting to determine the impact of migration on any developmental indicator. It is very difficult to isolate or take migration as an exogenous variable impacting on business investment or savings decisions. That is, any single development indicator one chooses may have some endogenous relationship with migration. For example, the decision to have a migrant to send remittance could be influenced by the existence of some savings account and business in the household. Also, unobservable traits such as self-motivation, diligence, and ambition that often characterise migrant households and make them send a member to the city may simultaneously have an effect on their probability of having savings and/or business investment. Following Mackenzie (2005), Chen (2008), and Liu (2008), the instrumental variable (IV) technique to estimate the "impact" of migration on one of the indicators of development—household business investment—was used. This technique helps account for the effect of the endogenous regressor(s) as well as selectivity more efficiently than an ordinary least square estimate would do.

4. DESCRIPTIVE CHARACTERISTICS

As stated earlier, in the introductory section, a lot of work has been done by other researchers (Cross, 2006; Gelderblom and Kok 1994; Posel, 2006; Wentzel and Tlabela 2006; Wentzel et al., 2006) and others; hence, not much detail is discussed here. There has generally been an upward trend in urbanisation and a downward trend in rural populations since 1994, most especially after the repeal of the segregation laws. Currently, about 62% of the country's population live in the urban areas, having gained about 7% increase since 1995. The major factor behind this trend is rural-urban migration (Stats SA, 2006a).

As Figure 7.1 shows the rates for internal migration are higher for the youth between ages 24 and 35 for both males and females. Males, however, have slightly higher rates (about 4% higher) than females from age 30 upwards. More males are expected to migrate, leaving the rest of the family behind. Below the age of 25 years, there seems to be much less difference between the sexes.

Table 7.1 reveals some interesting facts when comparing the incidence of migration, remittance savings, and business ownership in rural South Africa. Household migration and remittance status is given in three forms: households that have at least one migrant member and receive remittance; households that receive some form of remittance transfers but have no migrant member; and households that have at least one migrant member but receive no remittances. Apart from the area of settlement, the rest of the estimates are made for rural areas using the LFS 2003 data without the weights. About 30% of the rural households have at least one migrant

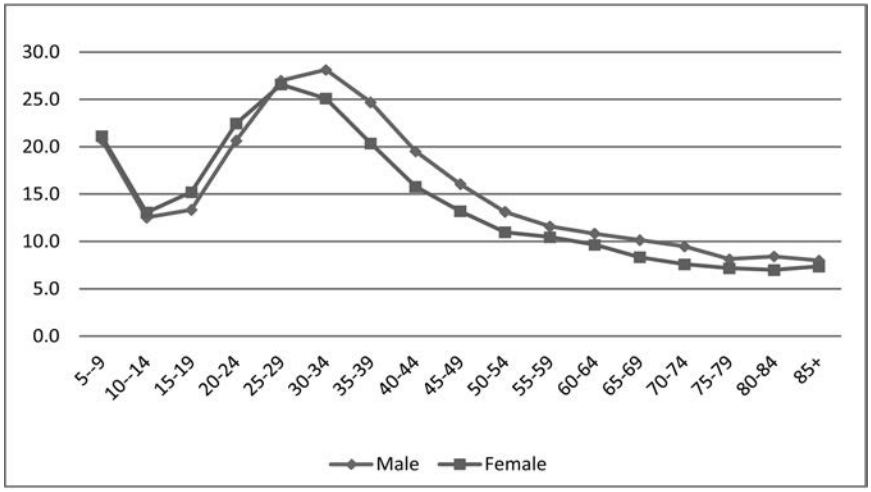


Figure 7.1 Age-specific sex internal migration rate
Source of data: World Urbanization Prospects: The 2007 Revision

member, while the urban areas make up just 7%. Even though about 70% of the rural households receive some form of remittance transfers, only less than half (45%) of the migrant households receive some remittance, indicating that a significant number of households receive transfers from nonmigrant sources. Female-headed households tend to have more migrants and have remittances as their main source of income (24%) than the male-headed ones (5.8%). This is in line with Figure 7.1 and confirms the findings of Collinson, Laurie, and colleagues (2006) that more males than females migrate, leaving their families in the villages. In the same way, female-headed households are also found to have more migrants (23%) but with no greater receipt of remittances than the male counterparts (11%). When it comes to the receipt of other remittances as the main source of income, there seems to be no significant difference between the two types of households.

Other household characteristics that are interesting to note are the household living standard and education level of the head. The proportion of migrant households decreases with an increase in wealth. Poorer households tend to have more migrants (32%) than richer ones (11%), and obviously more of the former have remittances as their major source of income than the latter. Thus rural-urban migration in the country seems to be associated more with the rural poor than the rich. More migrant households have heads with lower levels of education. However, in terms of remittances, the reverse is the case. Only about 10% of migrant households with heads that have completed primary school receive remittances compared with those that have completed secondary education. This trend also applies to households that receive remittances from nonmigrant sources.

Table 7.1 Migration, remittance, savings, and business: descriptive statistics

	Total No.	Migrant household (%)	Migration & remittance (%)	Remittance without migration (%)	Migration without remittance (%)	Savings (%)	Business (%)
Area							
Rural	11314	29.5	13.4	5.9	16.1	43.6	15.1
Urban	15511	6.7	2.2	8.1	4.4	65.3	12.9
Age of hh head							
<=45	5377	25.6	19.0	8.2	6.4	41.6	12.5
>=46	5937	33.1	8.3	3.7	24.8	45.4	17.5
Sex of hh head							
Male	6455	17.1	5.8	5.6	11.2	48.7	16.3
Female	4852	40.0	24.0	6.1	22.6	36.9	13.5
Marital status of hh head							
Married &/living together	5475	30.0	14.7	9.0	18	54.2	19.7
Not married	5832	29.0	12.2	2.9	14.4	33.7	10.8
Household size							
<=4	6957	23.6	12.4	7.2	11.3	43.5	12.4
>=5	4357	39.0	15.2	3.7	23.9	43.8	19.4

HH Living standard							
Bad	8009	32.1	15.7	7.9	16.3	32.5	13.0
Satisfactory	2281	28.8	10.0	1.0	18.7	62.6	16.7
Good	919	11.2	2.4	1.1	8.8	91.5	26.8
Education of hh head							
No education	2659	38.3	9.8	4.4	28.5	37.5	15.5
Primary	3387	28.3	12.0	5.0	16.2	38.4	13.8
Secondary	4427	29.0	18.7	8.1	10.3	48.9	15.4
Tertiary	468	12.4	3.20	3.0	9.2	91.5	28.6
Migration status							
Migrant hh	3342		45.4			**38.3**	**16.5**
Nonmigrant hh	7925		8.4			**46.1**	**14.6**
Remittance status							
Receiving hh	2180	**69.6**				25.0	9.5
Nonrecipient hh	9134	20.0				**48.1**	**16.4**

hh = household

In terms of savings and business ownership in the rural areas, households headed by older people seem have more savings and own more businesses than the younger ones. Interestingly, whereas more female-headed households receive remittances as their main source of income, fewer female-headed households (37% and 14%) have some form of savings and household business than male-headed ones (48% and 16%, respectively). In a way, this suggests that rural households that receive remittance as their main source of income could be too poor to save. This is confirmed by the fact that while a high percentage (92%) of richer households in the rural areas have some form of savings and 27% have ownership of business, only 33% and 13%, respectively, of their poor counterparts have savings and business. Also, having a migrant does not seem to give any advantage in the ability to save over not having one, as a smaller number of migrant households (38%) than nonmigrant households (46%) in the rural areas have some form of savings. However, when it comes to household business, migration seems to confer a slight advantage, as more migrant households (17%) than nonmigrant households (15%) own some business in the rural areas. Again, receipt of remittance as the main source of income does not seem to lead to better savings or business investment behaviours among the rural households in the country, as more (48% versus 25%) non–remittance-receiving households have some savings and investment (16% versus 10%) than the remittance-receiving ones.

5. EFFECTS OF MIGRATION AND REMITTANCE ON SAVINGS AND BUSINESS INVESTMENT

From the descriptive statistics, it seems that having a migrant gives some advantage to a rural household to have some form of business investment, but having remittance as the main source of income does not have this effect. The descriptive information suggests that this could be due to the fact that households that receive a remittance as their main income are probably too poor to save or invest. However, before we can confirm this, we need to control for fundamental differences in observed and unobserved characteristics that are likely to confound the results derived from the descriptive analysis. This is done by using propensity score matching (PSM) and IV-probit techniques.

5.1. Computing PSM Scores

Propensity score is the probability of taking a treatment (i.e. being a migrant household receiving remittance, receiving some remittance from nonmigrant sources, and being a migrant household without the receipt

of remittances) given a vector of observed variables as described. This is estimated using a *probit* function as follows:

$$P(x) = Pr[D=1|X=x] \quad (1)$$

where $P(x)$ is the propensity score, D is the treatment variables, and X is a vector of observed variables. A major assumption of this technique is the common support; that is, the propensity scores of the treated should be the same as the untreated or control cases. In other words, the propensity scores based on observed characteristics of, for example, migrant and remittance-receiving households should be the same as those households that do not have migrants and do not receive remittance as their main income. Since it is difficult to obtain the common support for the range of all values of both the treated and control groups, it is advisable that one should always use kernel density estimates to present evidence on how the treatment and control groups differ and on which subpopulation is being studied (Nichols, 2007). Appendix A presents kernel density estimates showing the ranges for which the propensity scores of both the control and treatment groups overlap. The adjacent graphs show the ranges to which the estimates were limited. Observations outside these ranges are discarded from the final PSM estimates.

5.2. Results from PSM Estimates

Table 7.2 presents the results from the PSM estimates using the nearest neighbour matching and stratification method. The average treatment effect (ATE) is 16%., that is everyone is about 16% less likely to save in the rural areas. But having a migrant and receiving remittance improves it a little, to about 12% less, the average treatment effect on the treated (ATT). In contrast, migration and receipt of remittance increases the likelihood of owning a business by about 6% when all the observed characteristics are controlled.

Receipt of other remittances, which are not necessarily from migrants, increases household savings behaviour by about 5%, while everyone in the population, whether or not they are exposed to this remittance, is about 37% less likely to have some savings. This shows the huge influence the receipt of other forms of remittance has on household savings behaviour. On the other hand, this type of remittance does not bring households totally out of the negative likelihood of investing in business. But the likelihood (–2%) is much less than everyone has (–13%) on average.

Having a migrant in the household without receiving remittance from the migrant surprisingly increases the likelihood of the household having some sort of savings in the rural area by 8%, about 5%, much more than the average propensity in the rural areas. Having a migrant member without

Table 7.2 Results from the PSM: treatment effects on savings and business investment

	Treated mean	Control mean	Difference	S.E.	T-stat
Model 1: Effects of Migration and remittance					
Savings					
Unmatched	0.316	0.438	–0.122	0.015	–8.08
ATT	0.316	0.334	–0.118	0.170	–0.069
ATE			–0.160		
Business Ownership					
Unmatched	0.127	0.163	–0.036	0.011	–3.23
ATT	0.127	0.068	0.059	0.164	0.36
ATE			0.212		
Model 2: Effects of remittance without migration					
Savings					
Unmatched	0.089	0.391	–0.302	0.035	–8.73
ATT	0.089	0.044	0.045	0.277	0.16
ATE			–0.372		
Business Ownership					
Unmatched	0.049	0.136	–0.087	0.023	–3.56
ATT	0.049	0.064	–0.015	0.357	–0.04
ATE			–0.131		
Model 3: Effects of Migration without remittance					
Savings					
Unmatched	0.479	0.437	0.042	0.017	2.53
ATT	0.479	0.395	0.084	0.024	3.53
ATE			0.023		
Business Ownership					
Unmatched	0.261	0.143	0.118	0.012	9.85
ATT	0.261	0.191	0.070	0.020	3.53
ATE			0.107		

remittance also increases the likelihood of business ownership by 7%, even though this is somewhat less than the average propensity, which is about 11%. The results from the PSM estimates generally resonate with those from the descriptive statistics, where it was clear that a smaller number of households with migrants and remittances have savings.

5.3. The Instrumental Variable (IV) Model

PSM only controls for fundamental differences in observed characteristics. In order to control for unobserved characteristics such as income shocks, ability, talent, risk aversion, and endogeneity, the instrumental variable technique is employed via the IV-probit. This investigates the impact of migration and receiving remittances on rural household savings and business investment status. Three main independent variables are the same as the ones used in the PSM technique. That is, the effect of migration and remittance in the regression analysis are: first, whether the household has a migrant and receives remittances; second, whether the household receives remittances but has no migrant; and third, whether it has a migrant but receives no remittances. The outcome variables of interest are whether the household has at least one form of savings and some form of small business as described in Section 7.5.1. The following probit regression is estimated to explain the savings and business ownership status of the household:

$$\Pr(Y_{hi} = 1|X_i, I) = \Phi(X_i\beta + I_h\gamma + \varepsilon_h) \quad (2)$$

where the outcome (Y_{hi}) is a binary variable which takes the value 1 if the household (h) has savings or business; otherwise zero. X_i is a vector of the household and the household head characteristics. The set of these characteristics includes migration and remittance status, age and age-squared of the household head, whether it is headed by a female, education level of the household head, living standard of the household, proportion of household members married, proportion of members who are children under the age of 15 years, proportion above the age of 15 years, and proportion of household members with completed primary, secondary, and tertiary education. I_h is an indicator of whether the household has a migrant member and receives remittances, receives remittances but has no migrant member, or has a migrant member but receives no remittances, and ε_h is the error term.

There may be some unobserved characteristics that select households into having migrants and savings or business investments. Also, migration and remittance status may be endogenous to household savings and business ownership status. The literature has often depended on the instrumental variable (IV) technique to overcome such endogeneity and selection bias problems (McKenzie, 2005; McKenzie and Rapoport, 2006; Woodruff and Zenteno, 2007). It has been argued that using the two-stage least square (2SLS) in case of a binary dependent outcome and endogenous variable might lead to inconsistent estimates. Hence it is suggested that in such cases, one should use generalised least square (GLS) estimates given under the *IV-probit* command in Stata (Newey, 1987). The selection model with GLS estimates is employed in this regard. This specification allows for the binary nature of migration and/or remittance and savings or business ownership and at the same time deals with the problem of self-selection

and endogeneity of migration (or remittance) by allowing the error terms in both savings and business ownership equations on the one hand to correlate with those of migration (or remittance) on the other. The model is specified as follows:

$$Y_i = \alpha_1 + \beta_1 migrmt + \beta_2 X_i + \varepsilon_i \quad (3)$$

$$migrmt_i = \alpha_2 + \beta_3 X_i + \gamma Z_i + \varepsilon_i \quad (4)$$

where Y_i is the observed binary outcome; it takes on the value 1 if a household has some form of savings (or business) and zero if not. The three independent variables of interest—migration and remittance, remittance without migration, and migration without remittance—concerning the status of the household are represented by *migrmt* with its associated coefficient β_1. A significantly positive sign of β_1 would imply that migrant families (or remittance-receiving families) have a higher probability of having savings or some business than nonmigrant (non–remittance-receiving) ones in the rural areas. The vector X_i contains other observed explanatory variables of household and household head characteristics as described under Equation 2. The variable Z_i represents the instrument used to identify migrant (or remittance-receiving) households. The endogeneity of $migrmt_i$ can be tested by H_0: $\rho = 0$. If the value of ρ is not significantly different from 0, the estimates from Equation 3 could be done using the standard probit model as presented in Equation 2. In that case, the error terms are not correlated.

An instrument must meet two criteria: first, it has to be correlated with the endogenous variable. Second, it has to be uncorrelated with the error term, that is, it should not affect the outcome variable via other channels than the instrumented variable. The instrument used is the community (ward) migration network measured by the percentage of households with at least one migrant member as obtained from census 1996. Such proxy for an instrument has been suggested and used in a number of studies (Acosta, 2006; Mansuri, 2006; McKenzie and Rapoport 2006; Taylor and Mora, 2006; Woodruff and Zenteno, 2007). The availability of a migration network in the community should be correlated with household migration and remittance receipt probabilities. That is, households within traditionally migrant-sending communities are more likely to have better social migration networks, which can potentially facilitate the migration of other members. In the case of the second condition, it is argued that the availability of a migrant network in the community is uncorrelated with a household's ability to have savings and own a business. Even if there is some correlation, the community network would influence household investment decisions through migration. It must, however, be pointed out that there is a possibility of other avenues through which community-level migration networks can affect household savings and business investment behaviour in addition

to household migration status. For example, one of the important determinants of migration is opportunities in the labour market, which in turn also affects a household's ability to raise funds for savings or business. A possible way to reduce the effect of this potential problem is to control for other variables at the community level. The percentage of the labour force employed in the community is included as a proxy for the community labour market opportunities. The inclusion of a vector of other household and household head characteristics should help in controlling for the socioeconomic composition of the households.

5.4. Results from IV-Probit Model

Table 7.3 compares the results from probit and IV-probit models measuring effects of the three major treatment variables while controlling for the same set of demographic and socioeconomic variables of the household head, the household, and the community. For all the models, the test for selectivity and endogeneity is not significant (i.e. ρ is not significantly different from zero). This is confirmed by the fact that the estimates from each pair are almost the same, especially as regards the significant values. We therefore focus mainly on the probit model for the comments. The effect on savings of having a migrant and receiving some remittance as the main source of income in the household is significantly negative in rural South Africa. But having a migrant member in the household, even without remittance, increases the probability of having some form of savings. These findings are consistent with the results from the PSM model. Thus the use of two different datasets does not make any difference in the effects of these treatments. What is not consistent with the PSM result is the effect of receiving remittance from nonmigrant sources. While the PSM found a positive effect of remittance-without-migration on savings, the probit finds otherwise. A possible explanation for this contradictory result could be the differences in sample: while the PSM discards those who are not matched in the propensity score, the probit model uses all. However, those who were discarded from the scores were only about 10% of the sample, so further investigation is needed to explain this contradiction.

The effects of the controlled socioeconomic variables are generally expected. The likelihood of having savings in the rural households increases with the increase in age of the household head, increase in the household head's level of education, and an increase in household wealth. These are consistent with the results from the descriptive statistics. Surprisingly, having more adults in the household decreases the likelihood of having some form of savings in the household, as more adults are expected to bring in more money if they are employed. But with a high level of emigration and with the finding that receipt of remittance as the main income does not have a positive effect on savings, perhaps this should not be surprising even if emigrated adult members do remit home.

Table 7.3 Results from probit and IV-probit models comparing effects of migration/remittance status on savings

	I		II		III	
	Probit	**IV-probit**	**Probit**	**IV-probit**	**Probit**	**IV-probit**
Migrant & remittance	–0.096**	–0.117**				
	0.050	0.275				
Remittance without migration			–0.689***	0.320		
			0.067	1.004		
Migration without remittance					0.157***	–0.082
					0.036	0.175
Age of hh head	0.015***	0.015***	0.014***	0.017***	0.015***	0.016***
	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)
Square age of hh head	–0.000***	–0.000***	0.000***	–0.000	–0.000***	–0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Female headed	–0.027	–0.023	–0.051*	–0.033***	–0.047	–0.039
	(0.038)	(0.053)	(0.030)	(0.035)	(0.030)	(0.031)
HH head education						
Primary	0.192***	0.193***	0.191***	0.191***	0.198***	0.189***
	(0.057)	(0.047)	(0.047)	(0.047)	(0.045)	(0.047)
Secondary	0.374**	0.375***	0.364***	0.373***	0.380***	0.367***
	(0.051)	(0.052)	(0.051)	(0.051)	(0.063)	(0.052)
Tertiary	0.812***	0.811***	0.807***	0.816***	0.830***	0.827***
	(0.153)	(0.155)	(0.154)	(0.152)	(0.135)	(0.153)

HH living standard						
Satisfactory	0.626***	0.626***	0.600***	0.631***	0.623***	0.627***
	(0.030)	(0.031)	(0.032)	(0.035)	(0.032)	(0.032)
Good	1.355***	1.354***	1.335***	1.341***	1.360***	1.544***
	(0.067)	(0.067)	(0.067)	(0.072)	(0.067)	(0.067)
Proportion hh married	0.311***	0.312***	0.278***	0.318***	0.304***	0.298***
	(0.046)	(0.052)	(0.058)	(0.055)	(0.045)	(0.046)
Proportion hh children	–0.015	–0.017	–0.037	–0.016	–0.004	–0.003
	(0.125)	(0.128)	(0.125)	(0.135)	(0.125)	(0.125)
Proportion hh adults	–0.171***	–0.175**	–0.120*	–0.178**	–0.132**	–0.162**
	(0.062)	(0.82)	(0.062)	(0.081)	(0.062)	(0.065)
Prop'n with no education	0.108	0.106	0.173	0.074	0.128	0.111
	(0.759)	(0.760)	(0.760)	(0.840)	(0.759)	(0.758)
Prop'n hh with primary	0.120	0.117	0.183	0.087	0.138)	0.126
	(0.758)	(0.758)	(0.758)	(0.758)	(0.757)	(0.757)
Prop'n hh with secondary	0.432	0.430	0.134	0.371	0.446	0.439
	(0.757)	(0.758)	(0.758)	(0.769)	(0.757)	(0.756)
Prop'n hh with tertiary	1.345*	1.341*	1.466*	1.305	1.357*	1.329*
	(0.785)	(0.785)	(0.787)	(0.803)	(0.785)	(0.784)

(*Continued*)

Table 7.3 (Continued)

	I		II		III	
	Probit	**IV-probit**	**Probit**	**IV-probit**	**Probit**	**IV-probit**
% community employed	0.005***	0.005***	0.004***	0.005***	0.005***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	–1.712**	–1.697**	–1.713	–1.792**	–1.798**	–1.768**
	(0.762)	(0.787)	(0.762)	(0.755)	(0.761)	(0.760)
No of obs.	11140	11140	11140	11140	11140	11140
Wald chi2	2360.93	1770.97	2474.22	1809.53	2374.42	1775.05
Pseudo R	0.155		0.162		0.156	
Wald test for exogeneity		0.938		0.3220		0.1633

hh = household; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; S.E. in parenthesis

Table 7.4 Results from probit and IV-probit models comparing effects of migration/remittance status on business investment

	I		II		III	
	Probit	**IV-probit**	**Probit**	**IV-probit**	**Probit**	**IV-probit**
Migration & remittance	–0.148***	1.468***				
	0.051	0.224				
Remittance without migration			–0.593***	–3.878***		
			0.089	0.272		
Migration without remittance					0.200***	1.019***
					0.040	0.142
Age of hh head	0.056***	0.061***	0.057***	0.025***	0.057***	0.050***
	(0.005)	(0.005)	(0.005)	(0.007)	(0.005)	(0.006)
Square age of hh head	–0.0004**	–0.000***	–0.000***	–0.000***	–0.000***	–0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Female headed	–0.371***	–0.371***	–0.180***	–0.166***	–0.181***	–0.202***
	(0.043)	(0.043)	(0.036)	(0.131)	(0.036)	(0.035)
HH head education						
Primary	0.001	0.000	0.000	–0.016	0.011	0.037
	(0.051)	(0.050)	(0.054)	(0.043)	(0.054)	(0.053)
Secondary	0.008	–0.008	0.034	–0.044*	0.051	0.088
	(0.058)	(0.055)	(0.059)	(0.048)	(0.058)	(0.058)

(*Continued*)

Table 7.4 (Continued)

	I		II		III	
	Probit	**IV-probit**	**Probit**	**IV-probit**	**Probit**	**IV-probit**
Tertiary	–0.079	0.101	–0.075	–0.1143*	–0.059	–0.049
	(0.130)	(0.125)	(0.130)	(0.108)	(0.130)	(0.128)
HH living standard						
Satisfactory	0.100**	0.085**	0.079**	–0.118***	0.093**	0.068*
	(0.038)	(0.036)	(0.038)	(0.038)	(0.038)	(0.038)
Good	0.037***	0.363	0.360***	0.074***	0.375***	0.361***
	(0.058)	(0.055)	(0.058)	(0.067)	(0.058)	(0.057)
Proportion hh married	0.098**	–0.068	–0.059	–0.129***	0.085	0.095*
	(0.057)	(0.058)	(0.057)	(0.048)	(0.057)	(0.055)
Proportion children	0.299*	0.441***	0.292*	–0.021	0.314**	0.300**
	(0.146)	(0.137)	(0.147)	(0.124)	(0.146)	(0.143)
Proportion hh adults	–0.479***	–0.108**	–0.427***	–0.043	–0.423***	–0.301***
	(0.075)	(0.091)	(0.075)	(0.084)	(0.075)	(0.078)
Proportion no educ	1.096	1.111	1.142	1.005	1.082	1.071
	(1.160)	(1.048)	(1.158)	(0.847)	(1.297)	(1.109)
Proportion Primary	1.153	1.175	1.200	1.029	1.134	1.106
	(1.158)	(1.046)	(1.158)	(0.846)	(1.149)	(1.107)

Proportion Secondary	1.382	1.378	1.445	1.362	1.358	1.300
	(1.157)	(1.046)	(1.155)	(0.847)	(1.148)	(1.107)
Proportion tertiary	1.972**	1.809	2.016*	1.630	1.953*	1.987*
	(1.164)	(1.054)	(1.162)	(–0.864)	(1.155)	(1.114)
% com'ty employed	–0.005***	(0.001)	–0.005***	–0.008	–0.004	–0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	–3.329**	–4.059	–3.389	–1.596	–3.440***	–3.366***
	(1.169)	1.056	1.166	–0.925	1.305	1.118
No of obs	11126	11126	11126	11126	11126	11126
Wald chi2	449.77	606.59	493.73	2361.92	515.76	485.32
Pseudo R	0.048		0.053		0.050	
Wald test for exogeneity		0.000		0.000		0.000

hh = household; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; S.E. in parenthesis

In Table 7.4, the effects of the three main variables of interest are compared using standard probit and IV-probit estimates. Unlike savings, the test for endogeneity, and selection bias is highly significant in all three pairs of models, indicating that there are some unobserved characteristics that select rural households into having migration and remittance, receiving remittance from other sources, and having migration without any remittance.

Having a migrant in the household and receiving a remittance and having a migrant without any receipt of remittance increases the likelihood of the rural household investing in some business venture. This is consistent with the results from the PSM estimated. Thus, after controlling for both observed and unobserved fundamental differences, migration is helpful in the establishment of business among rural households. But the receipt of other forms of remittance has a negative effect on business investment.

As regards the controlled variables, the effects of most of the characteristics are the same as the effects on savings. The age of the household head, household wealth, and the proportion of household members with tertiary education all have positive effects on the household's likelihood of investing in some form of business. But an interesting result here is the positive effect of the proportion of children under the age of 15 years on the likelihood of household business investment. Two possible explanations could be given for this. One, more children in the household could mean fewer adults who are away from home and might not be contributing meaningfully to household income as stated earlier; two, the presence of children could be a source of incentive to establish some small businesses, as the children would supply labour that is needed for businesses like small retail shops, which are common in rural areas.

5.5. Comparing PSM and IV-Probit Results

Even though we have tried to compare the results of the PSM and probit in the comments, a more useful comparison can be achieved if both households that are exposed to migration and/or remittances and any form of other remittances are reweighted with the propensity scores so that the distribution of the observed characteristics looks similar in both groups. The probit model is then used to estimate the conditional probability of being in the treatment group using the odds of the PSM scores as the weight. Table 7.5 presents the summary of the results. Only the marginal effects of the three main variables are reported for both savings and business investment. The estimates of probit reweighted with PSM scores are reported first for those who are likely to be in the treatment and then for everyone. The differences are almost negligible, again indicating that very few individuals were not matched in the sample by PSM. On a more important note, the consistency of effects of migration and/or remittance status of rural households differs across the models. The effect of migration and receipt of remittances, for example, is consistently negative on savings but not on business investment,

Table 7.5 Comparing marginal effects from probit reweighted with PSM scores, standard probit, and IV-probit

Probit reweighted with PSM score					
	Matched scores	**All scores**	**Standard PSM (ATT)**	**Standard Probit**	**IV-probit**
Effect of Migration & Remittance					
Savings	–0.015	–0.010	–0.118	–0.032**	
	(0.020)	(0.026)	(0.170)	(0.014)	
Business	–0.060***	–0.049***	0.059***		0.501***
	(0.015)	(0.012)	(0.164)		(0.088)
Effects of Remittance without migration					
Savings	–0.248***	–0.224***	0.045***	–0.204***	
	(0.077)	(0.039)	(0.277)	(0.017)	
Business	–0.192***	–0.178***	–0.015***		–0.273**
	(0.081)	(0.040)	(0.357)		(0.041)
Effects of Migration without remittance					
Savings	0.046***	0.040***	0.084***	0.052***	
	(0.017)	(0.015)	(0.024)	(0.012)	
Business	0.072***	0.029***	0.070***		0.302***
	(0.014)	(0.011)	(0.020)		(0.065)

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; S.E. in parenthesis

while the marginal effect of remittance without migration is consistently negative on business investment but not on savings. The most consistent effect is shown by migration without remittance, where households that have at least one migrant member are most likely to save and also invest in some form of business, even though they receive nothing from the migrants.

6. DISCUSSIONS AND CONCLUSIONS

Since the early 1990s, South Africa has seen an unprecedented increase in urban population, fuelled mainly by rural-urban migration. Although a lot of research has been done on the impact of various factors, trends, and patterns of these movements, little is known about the economic impact on the rural households, especially on the positive side. Despite the complexity of studying the impact of migration on any development indicator, we attempt to find the

impact of migration and remittance status on savings and business investment behaviour among the rural households. We do this by classifying rural households into three groups: (1) those who have at least one migrant member and receive a remittance; (2) those who receive remittances from sources other than migrants; and (3) those who have some migrant member but do not receive any form of remittance. Propensity score matching (PSM) and probit with instrumental variable technique were used to analyse the effect of being in any of these three groups on the household's probability of having some form of savings or business investment. The main hypothesis was that all three variables under investigation should have a positive effect on the probability to save and to invest in business. More specifically, it was hypothesised that those having migrants and receiving remittances should have a higher positive probability than those who receive only some sort of remittance, while those who receive some other sort of remittance should have a higher probability of saving and investing than those who have migrants but receive nothing.

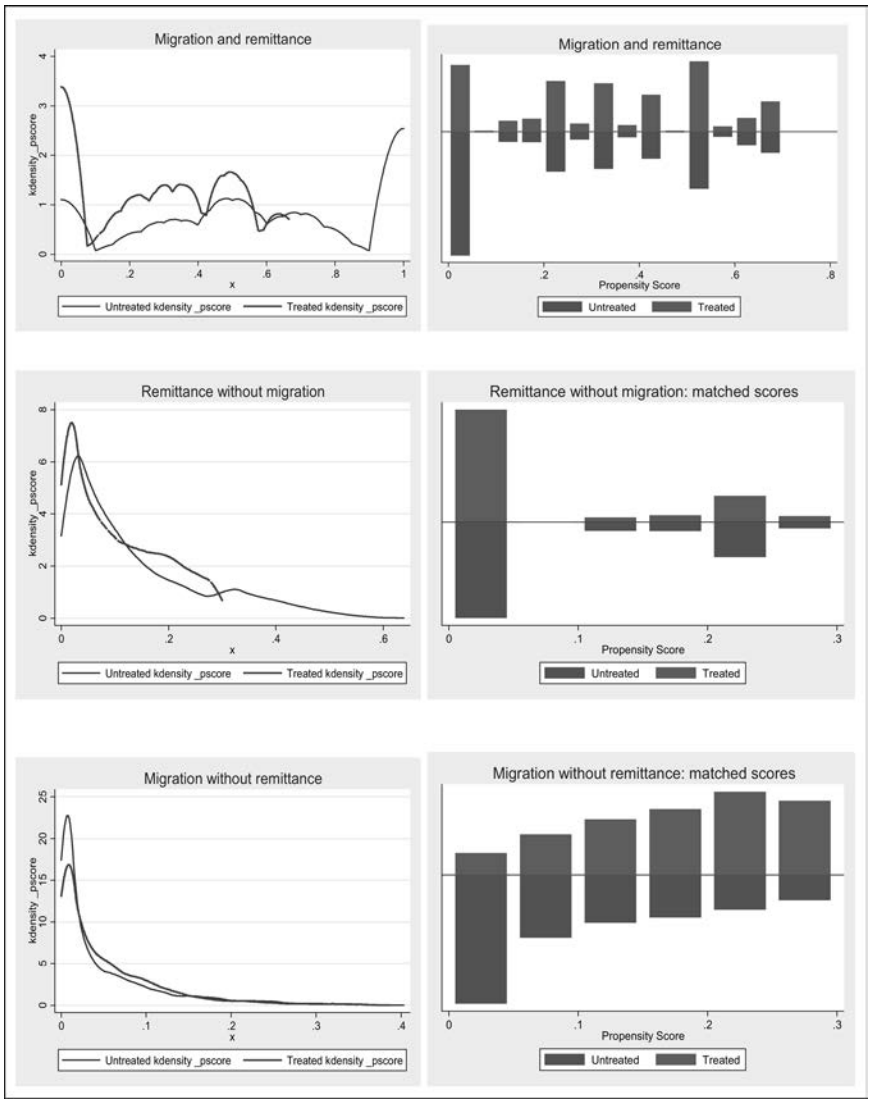
Generally, the results did not emerge exactly as expected. Migration and remittance receipt and other remittances were not only found to be less than the least expected impact—migration without remittance—but were found to have a negative impact on the probability to save by rural households. This is in contrast with the findings of Aggarwal and colleagues (2006), who found that the presence of remittance increases a household's probability of having a bank account. But these negative effects resonate with the work of Avila and Schlarb (2008), who use a similar technique to that employed here to analyse the effect of migration on savings in rural Moldova. Surprisingly, the effect of migration without remittance is highly positive on both investment and savings in all the models used. Thus the initial hypothesis—(1) > (2) > (3)—seems to have been reversed by the empirical results. Generally, it now reads as follows:

(3) > (1) > (2)

So what is it about remittance that it produces inconsistent, though largely negative, effects on both savings and business investment? The answer to this question could be related to the way remittance is defined in the study. Remittance, as discussed in Section 7.2.1, refers to receipts as the main source of income. Since it is the poor who are most likely to rely on remittance as the main source of income, as shown in the descriptive statistics, perhaps this result should not be surprising, since the poor have to use their main source of income on consumption expenditure rather than on savings or business investments. A migrant household, defined as having a migrant worker outside the community, on the other hand, is not necessarily associated with being a poor household. Nevertheless, the descriptive statistics show that rural households that have a migrant without any remittances are mostly found among the poor (16%), less than among the rich (9%). It could, however, be that these households still receive some remittances, even though they may have other sources as their main sources of income.

In conclusion, migration in general has some significant and positive potential effects on a rural household's ability to invest in some form of business, either as sole owner or in partnership with others. It also enables them to have some savings in the bank, such as stokvels, life insurance, and/or others. But this potential can only be achieved if rural households have some other source of income that is significant. If remittances are the main sources of income, rural households would always be spending on consumables and not on productive items such as a business investment.

Appendix A Kdensity plots and PSgraphs to check and correct for assumption of common support



NOTES

1. LFS is a quarterly household survey conducted by Statistics South Africa.
2. Stokvels are clubs or syndicates serving as rotating credit unions in South Africa, where members contribute fixed sums of money to a central fund on a weekly, fortnightly, or monthly basis.

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8 Temporary Population Movements into South Africa
Analysis of Border Statistics

Susanna Ubomba-Jaswa, Tshwaro Gae, and Duduzile Mazibuko

1. INTRODUCTION

1.1. Permanent and Temporary Population Movements

Spatial population movements have always been a sustained characteristic of human existence. Excluding commuting, people have moved either as individuals or in groups, whether forced or voluntary, for a variety of reasons; they have moved for short or long distances temporarily or permanently (United Nations [UN], 1973). One of the major distinctions that can be made with respect to a move is whether it involves the *intention* to make a change in one's usual geographical place of residence. Persons that intend to make a change in residence are regarded as *permanent movers*, whilst those with no such intention are regarded as *temporary movers*.

Population movements are often lumped together and erroneously referred to as *migration*. The 1998 UN recommendations on the statistics of international migration define an international migrant as any person who changes his/her country of usual residence (Lemaitre, 2005).

The United Nations International Organisation on Migration (UNIOM) reported that there were 75 million international migrants worldwide out of the population of 3.3 billion in 1965. The estimated number of international migrants has grown to an all-time high of 214 million in 2010 (UNIOM, 2011), comprising only 3.1% of the world's 6.9 billion population. In addition to permanent movers, there is a large group of temporary movers who cross national borders regularly but with no intention of migrating or changing residence (Brown and Bell, 2005). One such group is international visitors, who cross national boundaries for a variety of reasons. The United Nations World Tourism Organisation (UNWTO) estimated that from 1950 to 2010, international tourism arrivals expanded at an annual rate of 6.2%, growing from 25 million to 940 million (UNWTO, 2011).

Permanent and temporary movements show that most of the world's population never cross a national border but live, work, and die in their country of birth (Martin and Zürcher, 2008). While this could be the reality, what is quite revealing is the tremendous impact the movements of these

relatively few people have on the demographic, political, public health, economic, and social landscapes of the sending and receiving countries, as highlighted in a wide variety of disciplines as well as government policies and programmes. Unlike the permanent movements, temporary international movements have not received much attention in the demographic literature of population movements and distributions, though international visitors have an important impact on population and development.

This chapter focuses on individual, voluntary, temporary movements across South Africa's national geographical borders. As a result of the transitory nature of their movements, international visitors are very difficult to capture in national censuses and sample surveys, but some data can be obtained from administrative sources in the countries of destination. The movements are also by their nature repetitive, seasonal, and irregular (Bell and Ward, 2000). South Africa provides a unique opportunity, in terms of its geographical and economic position, political history, social cultural diversity, and long history of the collection of border statistics, to undertake this study.

1.2. Aim and Objectives

The interest of the study is to determine the similarities and differences in the flow and characteristics of international visitors who came to South Africa during the apartheid and post-apartheid periods. The objectives are to examine (i) the trends in the volume, seasonality, and country of residence of international visitors and (ii) the demographic profile and travel behaviour of international visitors with respect to the sex and age distributions, modes of travel, purposes of visits, and durations of visits.

1.3. International Visitors

Like international migrants, the concepts "international visitors" and "tourists" have their fair share of complexities regarding their definition, sources of data, and measurements. In this chapter, we will use the definition provided by UNWTO. A visitor is "any person travelling to a place other than that of his/her usual environment for less than 12 months and whose main purpose of the trip is other than the exercise of an activity remunerated from within the place visited." Visitors are composed of **same-day visitors** and **overnight visitors** or **tourists**. A same-day visitor is a visitor who visits a place for less than one night, whereas a tourist (overnight visitor) is "a visitor who stays at least one night in collective or private accommodation in the place visited" (UNWTO, 2008). Visitors are therefore short-term or temporary (the duration of the stay is less than twelve months) movers whose main purpose of travel is not work related—that is, not to be remunerated in the place visited. These movers tend to be holiday makers, students, patients, persons who have travelled for business purposes, and the like. The UNWTO further indicates that "**tourism** comprises the activities

of persons travelling to, and staying in places outside their usual environment, for not more than one consecutive year, for leisure, business and other purposes." International visitors, therefore, are visitors who move across national boundaries for tourism purposes.

All countries have rules and regulations and systems such as travel documents, visas, and permits that are used to manage the flow of people across national borders. These are put in place for identification and screening purposes of citizens, residents, and foreigners in order to determine the purpose of entry and apply conditions of admission. Despite the differences in coverage and quality of information, all countries collect border statistics through their immigration offices at the ports of entry/exit. In addition, information on international visitors is available from a variety of databases of government departments as well as organisations and institutions (guest accommodations, airlines, banks, investment and insurance companies, travel agents, universities, etc.) that have interests in international travel and tourism activities. These data are either collected from sample surveys at the ports of entry/exit or during their routine administrative service to clients. National statistical offices and departments of tourism tend to analyse and publish information on visitors.

Inherent in all population movements are the push and pull determinants. However, a fundamental difference exists between most *visitors* (same-day and tourists) and other types of migrants and temporary movers. While the push to visit could be largely determined by the socio-psychological needs involving adventure, recreation, leisure, and so on, migration and other forms of temporary movement tend to involve engaging in some form of income-generating or economic activities. So visitors can be viewed both from the perspectives of the country of origin and destination as *income spenders*, compared to migrants and the other groups that are generally regarded as *income seekers*.

Tourism has been one of the major spin-offs of the general technological and socioeconomic progress often referred to as globalisation that the world has witnessed since the mid-twentieth century. Communication technology has opened up information transfer and sharing, providing abundant knowledge about people and places beyond one's national borders. This has resulted in growing interest and curiosity among people to have a wide variety of new experiences in other countries (Bertinato and Canapero, 2008; Lickorish and Jenkins, 1997; Macready and Tucker, 2011).

In response to these pull factors, virtually every country is creating and developing its tourism industry through the various forms of tourism infrastructure such as transport, accommodation, attraction sites/venues, and so forth. Tourism is a visitor-based industry that relies heavily on international visitors for its growth. Therefore, national policies and regulations on population movements generally tend to be more *generous* in their quotas relating to the admission into the country of visitors than the admission of immigrants and workers (Martin and Zürcher, 2008).

This interplay of demand and supply has generated huge visiting populations around the globe. Like migration, the flow of visiting populations has both positive and negative consequences for the sending and receiving countries. Economically, it is acknowledged that tourism has become one of the fastest-growing key drivers of today's world economic development. According to the UNWTO (2011), tourism contributed 6% to 7% of the overall number of jobs worldwide and generated US$919 billion income through visitor arrivals in 2010. The negative impacts on the environmental and socio-cultural resources are widely recognised, as shown in the worldwide drive towards sustainable and eco-friendly tourism (UNEP and UNWTO, 2005; UNWTO, 2007).

The relationship between population movements and the spread of infectious diseases has long been established. Indeed, several studies have shown the association between migration and a number of infectious diseases, including HIV/AIDS. However, not much is known about international visitors and the spread of infectious diseases (Yanni et al., 2009). Lumping all movers together as migrants makes it very difficult/impossible to distinguish these temporary movers from the migrant group. Visitors generally are not required, unlike migrants and immigrants in particular, to be medically screened and subjected to producing all types of health records before admission. The outbreak of pandemics such as severe acute respiratory syndrome (SARS) and influenza A pandemic (NIHI) has shown not only how quickly infectious disease can be spread internationally through visitors but also the negative effect on tourism for destination countries (Dixon et al., 2010; Mao, Ding, and Yu-Lee, 2010). Besides other public health concerns such as sanitation, particularly during mass groupings of visitors for conventions, sporting activities, and the like, individual interactions whether among the visitors themselves or with local people do influence the transmission of infectious diseases, including sexually transmitted infections (Richter and Massawe, 2010).

2. METHODOLOGY

2.1. Source of Data

Since the apartheid era, the Department of Home Affairs (DHA) has been responsible for all issues related to international population movements of both residents and non-residents (foreigners) into South Africa. The jurisdiction of this responsibility is enshrined in the various immigration acts, amendments, laws, and regulations. The last immigration act of the apartheid regime was the Aliens Control Act, No. 96 of 1991. Post-apartheid South Africa uses the Immigration Act of 2002 and its amendments, especially the Amendment of 2004.[1] Changes and amendments in these legal frameworks affect the flow of travellers as well as the methods and types of data collected.

One of the major concerns with the border statistics collected during the apartheid period is the level of coverage; generally South Africa recorded low volumes of visitors. In addition, the country characteristics of visitors were skewed and reflected the response to the racist policies of South Africa then. Hence, travellers' records mainly included persons from the former so-called independent Bantustans like Transkei and Bophuthatswana and a limited number of foreign countries (Byrnes, 1996; Crush, 2000). The low volumes of African countries are striking; with the exception of a few countries, virtually all the data referred to countries bordering South Africa.

However, the coverage of visitors from these border countries was also not consistent. For example, sometimes, only data on labour migrants or persons with border traffic concessions, especially from Botswana, Lesotho, and Swaziland, were recorded, and no data on the ordinary travellers. Namibia did not have full immigration status until the early 1990s. In addition, the transitional period to a united South Africa also had a significant impact on the harmonisation of the immigration systems of the Republic versus the independent states. In the process, fragmentation and loss of data could not be ruled out. Nevertheless, the cooperation between DHA and Stats SA in the implementation of various new computerised processing and archiving systems has facilitated the creation of credible databases of border statistics, scanned published reports as well as hard copies of reports that could be used for a variety of research projects.

Currently there are seventy-one ports of entry distributed throughout the country. Each port of entry has its own database for the collection of border statistics, linked to the DHA's national Movement Control System (MCS) at its head office in Pretoria. Embarkation and disembarkation cards/forms are no longer used at South African ports of entry. Data on travellers (both residents and non-residents) are routinely collected electronically (by the scanning of travel documents) and by direct capturing of additional information into the port's database and then regularly transmitted to the MCS mainframe. This data collection method provides real-time data on travellers from the ports of entry. A very crucial characteristic of all border statistics (the world over) irrespective of the method of collection is that the counts relate to individual movements rather than to the number of people within a given reference period; each of the multiple movements of an individual is counted separately.

The strength in border statistics lies in the fact that the data act like census information since every visitor that passes through each of the ports of entry is counted, unlike sample surveys. The continuous nature of the data collection also provides real-time data of arrival and departure. The quality of data is greatly enhanced, not only by the electronic collection of information as opposed to the paper-based method but also by the fact that the data are collected primarily for national security purposes. The Department of Home Affairs collects a wide range of information on travellers at the ports of entry for its own national security and administrative purposes. Data

from the ports are consolidated on the MCS mainframe and stored with the State Information Technology Agency (SITA). Stats SA has DHA's approval to download arrival and departure data and process and publish the results on the movements of residents and foreigners for each calendar month in its monthly "Tourism and Migration" release (P0351). This exercise dates back as far as the 1970s. An annual report, *Tourism*, containing the merged data of the twelve months, is also published by Stats SA.

We did not collect new data from DHA for the analyses in this chapter; rather, we reprocessed data already available at Stats SA. A number of obstacles were encountered when processing the data for the selected period, 1980 to 2009. The first is the unavailability of electronic data from 1992 to 2003. This implied reliance on data from published hard copies. Second, the way the data were analysed and published is not always useful for the present analyses, particularly because some variables were not distributed across other variables. Third, variables such as sex were published, stopped, and resumed, resulting in gaps across the years. Fourth, the age variable (e.g. age) was not analysed until 2005. Moreover, the intended duration of stay data published by Stats SA could not be used since they were calculated based on the length of stay (i.e. the maximum number of days allowed) given on the temporary resident permit (TRP), which does not give a true reflection of actual days spent. A reliable duration-of-stay variable became available to Stats SA only in 2009, when the data on dates of arrival and departure were used to calculate the duration of stay during the month of arrival and to create two new variables, namely same-day visitor and overnight visitor (tourist). Despite all these shortcomings, there were sufficient accumulated data on the visiting population that could be used. The analyses in this chapter are based on data collected at all the airports, seaports, and land points of entry between 1980 and 2009.

2.2. Variables for Analyses

Visitors

Visitors are composed of foreign arrivals that were issued with *visitor*,[2] business, study, or transit TRPs on arrival at the port of entry. Other foreign arrivals, such as persons with all types of work TRPs, are not included in the analyses since they are non-visitors. The possibility of future "category jumping" cannot be ruled out once a visitor has been admitted to the country.[3] However, in this chapter, we are dealing with the TRP issued at the time of arrival.

Country of Residence

This variable should not be confused with the country of nationality or the country the traveller arrived from. It is the country the traveller considers as his/her country of permanent residence. The countries were grouped

into sub-regions consisting of Europe, North America, Central and South America, Australasia, the Middle East, and Asia. These six sub-regions together comprise the overseas region. Africa was regarded as a region, with countries of the Southern Africa Development Community (SADC), East and Central Africa, West Africa, and North Africa as the sub-regions. Due to the unique affinity of SADC countries with South Africa, we decided to break the analysis into two, namely SADC and "other" African countries, in order to obtain a clear picture of the movements of visitors from the continent.

The other key variables are defined as follows:

- **Sex:** male or female
- **Age** (in years) is calculated using the date of birth and the date of arrival
- **Mode of travel:** refers to air, rail, road, or sea transportation
- **Purpose of travel:** business, holiday, study, and transit. During the analysis, we combined the transit data with the holiday category because there were few cases.
- **Visitor status:** refers to same-day visitor or overnight visitor (i.e. a tourist)
- **Duration of stay** (in days): is calculated using the dates of arrival and departure of visitors who entered and left the country in the same month

2.3. Analyses

The analyses were based on the trends and patterns of the flow and characteristics of visitors during the apartheid (1980 to 1990) and post-apartheid (1990 to 2009) periods. Due to the fragmented nature of the data as discussed, the analyses did not go further than the descriptive level. Descriptive statistics were used to compare the trends in the volume, the sex differentials, the mode of travel, and the purposes of visits before 1990 and 1990 and beyond. Data on age and duration of stay were analysed only from 2005 and 2009, respectively.

Because of the large amount of data covering 1980 to 2009, we decided to incorporate some of the relevant results already available in Stats SA publications, that is, the monthly Tourism and Migration Release and the annual report on tourism. Time-series analyses were done on the monthly arrival data from 1980 to 2009 in order to assess the "true" trends and to study the effects of seasonality on the volumes of visitors. A comparison of the trends and patterns of the volumes, the demographic characteristics, and the travel behaviour of visitors from overseas and African (SADC andother-African) countries during the observation period was done highlighting the similarities and differences that existed before and after 1990.

3. RESULTS

3.1. Trends in the Volume of Visitors (1980 to 2009)

3.1.1. Overall

The time series data clearly indicate that the pattern of seasonality of visitors to South Africa was well established. Throughout the period of observation, as presented in Figure 8.1, Figure 8.2, and Figure 8.3, the winter months peaking in June were the low-season period, whilst the summer months saw the arrival of more visitors, with the highest volume recorded in December. This general pattern notwithstanding, marked regional and country-specific differences are observed from results published in Stats SA's annual *Tourism 2001 to 2009* reports. For example, visitors from the United Kingdom (UK) followed the general seasonality pattern shown, whereas the winter months of June, July, and August were the peak periods for visitors from the United States of America (USA). The flow of students is also well marked: January and July are the peak arrival months for students, indicating the beginning of the major academic terms/semesters.

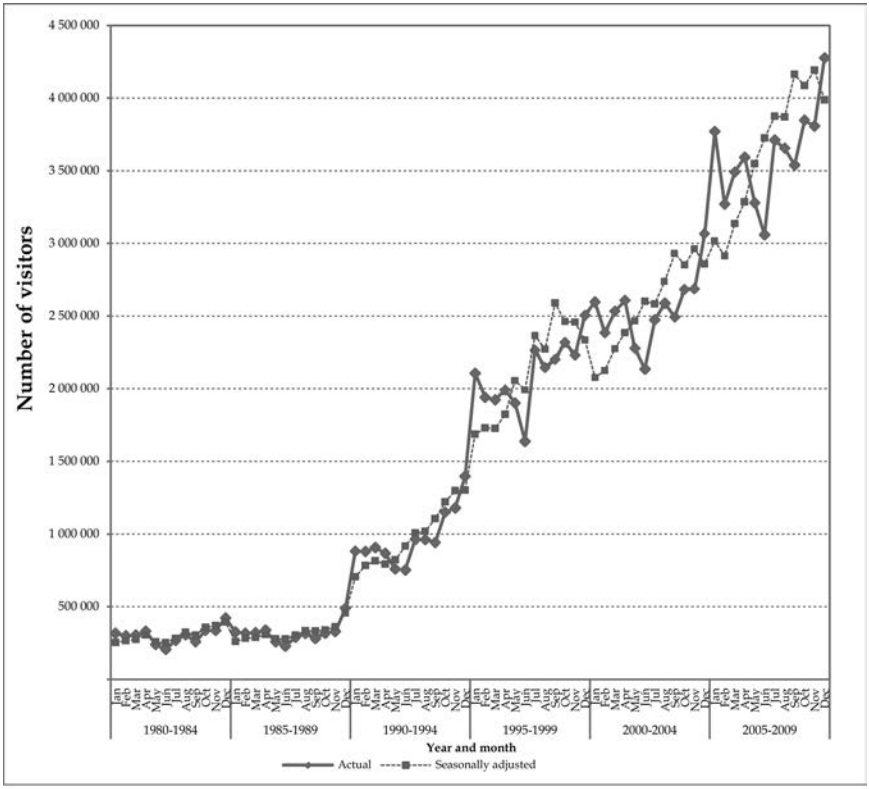

Figure 8.1 Total number of visitors to South Africa, 1980–1984 to 2005–2009

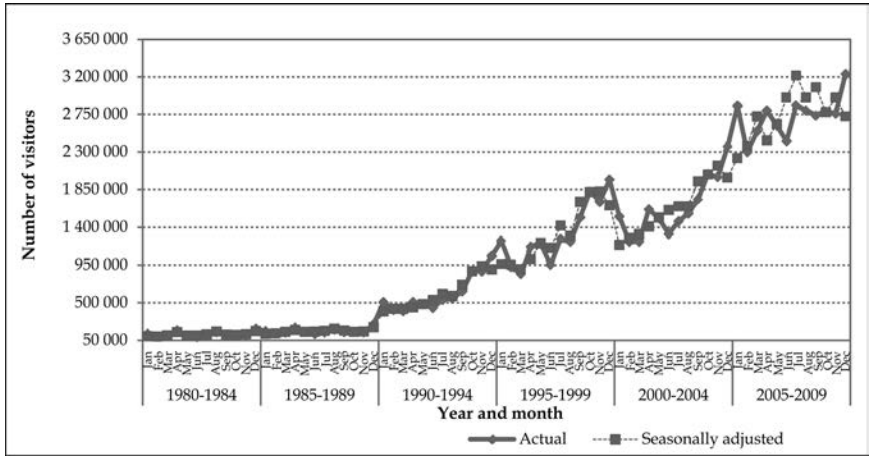

Figure 8.2 Number of visitors from African countries to South Africa, 1980–1984 to 2005–2009

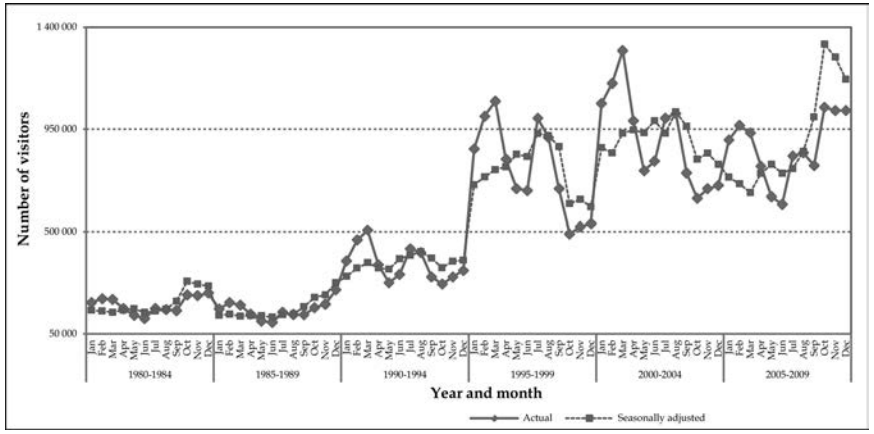

Figure 8.3 Number of visitors from overseas countries to South Africa, 1980–1984 to 2005–2009

In 1980, the volume of visitors was 702,794. The volumes of visitors were fairly stable until the end of the 1980s. A steady growth started during the latter years of the 1980s until 1991, when the number of visitors reached the 1 million mark. Soon after independence (1994), there was a continual increase, with a slight drop in 2001. Thereafter, the volume of visitors steadily increased throughout the decade until it reached almost 10 million in 2009. The flow of visitors grew annually, at 6.0% between 2005 and 2009.

3.1.2. Regions and Sub Regions

Despite the fact that arrivals from both overseas and Africa followed basically the same trend, there were some major differences regarding the volumes and annual growth rates. The 1980s volumes of visitors from overseas could rightly be described as somewhat bumpy until 1990; thereafter degree of stability was observed. In 1980, 399,983 visitors from overseas were recorded. Ten years later, the volume had increased to 492,116. The volumes were quite steady with some slight increases till the end of 1994. Despite the distinct fluctuations that characterised the early decade of the 2000s, the arrival of visitors continued to grow until 2008 (2,179,245), with a slight and short fall in 2009 (2,078,214). The annual growth rates indicate that visitors from overseas grew at 2.4% in 1980 to 1984. The highest growth rate was recorded in 1990 to 1994; then a decline set in until a rate of 1.8% was observed for 2005 to 2009.

The volumes of visitors from Africa in the 1980s were relatively more stable than those coming from overseas. Except for the declines in volumes in 1981 and 1985, the volumes continued increasing, from 302,806 in 1980 to 535,501 in 1990. It is worth noting the significant increase in the volume of arrivals from Africa during the period 1990 to 1994, where the annual growth rate for Africa was 42.3% compared to that of overseas, which was 8.2%. Furthermore, the steep drop in the annual growth of visitors from Africa, observed in the 1990 to 1994 rate of 42.3% declining to 4.8% in 1995 to 1999, was absent in the overseas data. The growth rates for other Africa and overseas were fluctuating throughout the 2000s. Thus, apart from the similar annual growth shown in the 1980 to 1984 period, wide differences emerged thereafter between the Africa and overseas regions.

Prior to 1985 to 1989, the proportion of visitors from overseas was higher than that of visitors from Africa. In 1980 to 1984, overseas visitors constituted about 60.0% of all visitors to South Africa. However, by the end of the 1980s, their contribution had dropped to about half. At the beginning of the 1990s, the proportion of overseas visitors plummeted to less than a quarter (23.3%), resulting in a drastic relative increase in the share of visitors from Africa (76.7%). Although there was some slight increase in the overseas contribution from 1995 to 1999 and 2000 to 2004, it was short lived. In the period 2005 to 2009, the overseas proportion was less than a quarter. Visitors from Africa, however, showed continual growth despite the slow decline they experienced during the 1999 to 2004 period. Consequently, since independence, the share of visitors from Africa had not dropped below 70.0%. In the period 2005 to 2009, the recorded proportion for visitors from Africa was 75.8%.

Since the apartheid period, published data from Stats SA Tourism and Migration releases and Tourism Annual Reports (1980 to 2009) indicate that the bulk (not less than 60.0%) of the volume of overseas visitors have been residents of Europe, with the lowest number coming from the Middle East. The UK, Germany, United States, the Netherlands, France,

and Australia have been the leading contributing countries to the volume of visitors from overseas since 1980. Virtually all (at least 95.0%) visitors from Africa were residents of the SADC countries. The percentage of visitors from the remaining sub-regions—that is, East and Central Africa, West Africa, and North Africa—never reached 5.0%. Furthermore, the six border countries—Lesotho, Zimbabwe, Swaziland, Mozambique, Botswana, and Namibia—have been the leading contributors to the volume of visitors from Africa.

Data in Table 8.1 explored in some detail the annual growth patterns in the overseas and Africa sub-regions using data from 2005 to 2009. All the overseas sub-regions experienced positive growth in visitor arrivals between 2005 to 2006 and 2006 to 2007, with Europe showing the least growth for both periods. In 2007 to 2008, only Europe and Asia had negative growth. Apart from Central and South America and Asia, which showed positive growth, the share of the remaining sub-regions declined in 2008 to 2009. Contrary to data on the overseas sub-regions, the annual growth rates for arrivals during the 2005 to 2006 to 2008 to 2009 periods for all the Africa sub-regions showed positive growth despite differences in magnitude. The growth in arrivals was generally high during the first two years compared to the last two years. Although SADC, like Europe, had the largest volumes of arrivals in their respective regions, their annual growth consistently declined during the 2005 to 2009 period.

Table 8.1 Annual growth rates of visitors by sub-region

Year	2005–2006	2006–2007	2007–2008	2008–2009
OVERSEAS				
Europe	5.7	2.4	–0.4	–4.6
North America	10.6	8.6	4.5	–9.4
Central and South America	14.4	5.6	9.6	2.6
Australasia	13.1	6.3	5.0	–7.1
Middle East	6.5	10.7	10.7	–6.1
Asia	7.4	13.1	–7.7	2.6
AFRICA				
SADC	17.1	9.3	7.0	3.0
East and Central Africa	10.5	10.4	5.8	7.1
West Africa	14.7	16.3	8.8	0.3
North Africa	8.7	8.5	11.1	4.8

3.2. Sex and Age Structure

Data on the sex structure are available from 1983. However, there was a long break from 1993 to 2004, when data were not made available. In 1983, 417,086 (59.2%) male and 287,358 (40.8%) female visitors were recorded. In 1989, the volumes had increased to 538,377 (57.9%) males and 392,016 (42.1%) females. Ten years later, in 2009, there were 5,190,036 (54.5%) male and 4,328,364 (45.5%) female visitors. Since the apartheid period, more male than female visitors have continued to come to South Africa. However, as shown, the proportion of males had declined whilst that of female visitors had increased. Available data for the five-year period (2005 to 2009) for all the three regions, namely overseas, SADC, and other Africa, followed the general visitor pattern of more males than females. However, as shown in Table 8.2, throughout the period of observation, the proportion (about 45.0%) of females from SADC was higher than that of visitors from overseas and other Africa countries. Similarly, there was a marked higher proportion (about 70.0%) of males among visitors from other Africa.

Data on the age structure were available from the year 2005. A significant proportion (about 30.0%) of visitors was young adults in the 25 to 34 age group. This group was followed by those in the 35 to 44 age group (about 22.0%). The proportions of visitors aged 55 to 64 and those younger than 15 were less than 10.0% each, whereas those aged 65 years and older (the elderly) constituted less than 4.6% throughout the 2005 to 2009 period of observation. The flow of visitors in the age group 25 to 34 increased steadily, from 29.2% in 2005 to 32.2% in 2009. The age group 35 to 44 years also showed some increase from 21.9% to 22.3% during the same period. However, the proportion for those aged 0 to 14 years fluctuated, whereas the remaining age groups—15 to 24, 45 to 54, 55 to 64, and 65 years and older—declined.

Generally the patterns in the three regions were similar to the global data. Nevertheless, there were a number of differences. Unlike SADC and other Africa that had less than 5.0% of their male and female visitors classified as elderly, the proportion of elderly overseas male and female visitors was around 10.0%. The data also show that the highest numbers of male

Table 8.2 Percentage distribution of visitors by region and sex (2005 to 2009)

Region	Sex	2005	2006	2007	2008	2009
Overseas	Male	56.1	56.1	56.0	56.3	56.5
	Female	43.9	43.9	44.0	43.7	43.5
SADC	Male	53.3	54.7	55.1	54.6	53.7
	Female	46.7	45.3	44.9	45.4	46.3
Other Africa	Male	68.3	68.6	68.5	68.4	67.4
	Female	31.7	31.4	31.5	31.6	32.6

Table 8.3 The percentage distribution of visitors by purpose of visit and region, 2005 to 2009

Year	Region	Grand Total	Business	Holiday	Study
2005	Overseas	1,936,824	3.6	95.6	0.7
	SADC	5,136,119	2.3	95.5	2.2
	Other African	115,822	9.2	85.5	5.3
2006	Overseas	2,075,138	4.0	95.3	0.7
	SADC	6,014,501	1.7	96.6	1.7
	Other African	129,862	8.9	85.5	5.5
2007	Overseas	2,172,339	3.5	95.8	0.7
	SADC	6,573,241	1.7	97.1	1.2
	Other African	146,481	8.1	86.6	5.3
2008	Overseas	2,179,245	3.2	96.2	0.7
	SADC	7,035,915	1.5	97.4	1.0
	Other African	157,516	6.6	88.4	5.0
2009	Overseas	2,078,214	2.2	97.2	0.7
	SADC	7,249,758	0.8	98.3	0.9
	Other African	163,613	4.2	91.4	4.4

and female overseas visitors were in the 35 to 44 and 25 to 34 age groups, respectively. The majority of visitors from SADC were in the 25 to 34 age group, even though the proportion of males (about 35%) was slightly higher than that of females (about 30%).

In respect of visitors from other African countries, the proportion (30%) of males aged 25 to 34 was more or less the same as that of the age group 35 to 44. However, data on the females indicate that a high proportion (about 30%) of them were in the 25 to 34 age group, compared to about 25% in the 35 to 44 age group. For visitors from SADC and other Africa, the male and female visitors aged 25 to 34 years made up at least 30.0% of the visitors. Furthermore, overseas and other Africa data show stability and some amount of fluctuations. Data from SADC clearly indicate an increase in the age groups 25 to 34 and 35 to 44, particularly among the male visitors. Thus, in 2005, the proportion of males aged 25 to 34 years was 35.2% and that of the 35 to 44 age group was 21.6%. Five years later, these proportions had increased to 37.5% and 23.3%, respectively.

3.3. Mode of Travel

Four modes of travel—air, rail, road, and sea—are used to travel in and out of the country. According to results published by Stats SA from 1980

to 2009, the use of rail and sea never reached 3.0% and has consistently declined. However, the volume of visitors who travelled by road and by air increased during the observation period despite changes in the patterns. The proportion of visitors that travelled to South Africa by road was 50.9% in 1990. By 2009, the contribution of road users had escalated to 73.2%. Conversely, slightly more than half (around 55.0%) of visitors flew into the country during the 1980s, but this practice changed in the 1990s. In 1991, the proportion of air arrivals fell to 34.8% and continued a downward trend until it reached 24.6% in 2009. At least 80.0% of visitors from overseas and other Africa used air transportation, whereas at least 90.0% of visitors from SADC travelled to South Africa by road. These patterns have been consistent throughout the five-year period 2005 to 2009.

3.4. Purpose of Visit

Throughout the thirty-year observation period, holiday remained the main reason for coming to South Africa. This reason was followed by business visits and visitors who had come to study. During the apartheid period, the proportion of visitors on holiday was generally below 80.0%, whilst the proportions arriving for business and study never reached 25.0% and 2.0%, respectively. There was a moderate increase in the volume of arrivals for all three categories of visitors between 1980 to 1984 and 1985 to 1990. However, the percentage change was higher for visitors on holiday and students compared to those on business. The number of arrivals for holidays increased by 8.7% from 2,698,568 in 1980 to 1984 to 2,933,769 in 1985 to 1989. For the same period, the volume of students increased by 6.9% from 82,476 to 88,173, whereas business visits grew by 1.7% from 785,051 to 795,759. The striking jump in the total number of visitors noted earlier in the chapter was observed in the 1990 to 1999 data for all three types of visitors. Business increased from 795,759 in 1985 to 1989 to 2,411,339 in 1990 to 1995. Holiday volumes for the same periods were 2,933,769 to 9,497,585, and numbers of students were 88,173 to 121,686. Marked differences started appearing in the categories from 1995 onwards. For example, between 1990 to 1994 and 1995 to 1999, the arrival of visitors on holiday grew by more than 100%, from 9,497,585 to 22,387,360, whereas students grew by 81.6% from 121,686 to 221,078 and businesspeople by 30.2% from 2,411,339 to 3,139,137. In addition, business arrivals dropped from 3,139,137 during the 1995 to 1999 period to 897,035 in 2005 to 2009 period. On the contrary, by 2005 to 2009, the volumes of holidaymakers and students had increased to 42,008,457 and 587,635, respectively.

Holidaying is the main purpose of visiting South Africa, but some differences are found among overseas, SADC, and other African visitors regarding their purposes of visit. Besides holidays, a relatively higher proportion of visitors from other African countries came for business and to study. Indeed,

the proportions of visitors on business and study were higher for the region compared to overseas and SADC throughout the five-year period. The data also show that in addition to holidays, more overseas visitors came for business than for study. On the contrary, there were more students than businesspersons from the SADC countries. It is also found that with the exception of a moderate increase from 2005 to 2006 in visits by business persons from overseas, the proportion of businesspersons declined for all regions. Regarding students, the proportions for overseas were stable; SADC consistently showed a decline, whilstother Africa started to drop after 2007.

The data on purpose of visit was further analysed to show the countries' selective bias regarding reasons for coming to South Africa. During the 2005 to 2009 period, the UK, Lesotho, and Nigeria had the highest percentages of persons coming for holidays from overseas, SADC, and other African countries, respectively. Similarly, the UK produced the highest percentage of business persons from overseas. Zimbabwe was the leading contributor to businesspersons from SADC, but Namibia overtook it in 2009, contributing around 35.0%. There was a mixed bag for the other African countries, with Nigeria leading with 20.0% in 2005 and 23.0% in 2007. Ghana (25.0%) was leading in 2006, but Kenya (about 25.0%) took over in 2008 and 2009. In respect of students, besides Germany having the highest percentage of students from overseas in 2005, American students dominated in the remaining four years. The highest number of students from the SADC countries was composed of residents from Botswana. Even though their strong share in 2005 (45.0%) dropped, they still maintained a quarter share of the student volume in 2009. Kenyan and Nigerian residents were the leading role players among students from other Africa. Kenya's students (25.0%) led the student group in 2005, but Nigeria overtook them in 2006 to 2008, although that was short lived, as Kenya regained the lead in 2009.

3.5. Duration of Stay

In 2009, Stats SA for the first time fine-tuned its data on visitors by categorising visitors as same-day and overnight or tourists. According to the 2009 data, of the 9,531,615 visitors, 2,519,750 (26.4%) were same-day visitors and 7,011,865 (73.6%) were tourists. Same-day visitors were mainly SADC (91.8%) residents. Virtually all (91.6%) the same-day visitors entered South Africa by road, whereas 8.4% flew in. Tourists appear to follow a similar seasonal pattern to that observed among visitors. In 2009, February and June recorded low volumes, whereas December was the peak month. The 2009 data do not show any pronounced monthly differences in the volume of same-day visitor arrivals. Therefore, the seasonal pattern of same-day visitors needs to be monitored over a couple of years to determine whether an established pattern exists. In addition to the available information on same-day visitors, the 2009 data provide information on the duration of stay of overnight tourists who arrived and left in the same month. Tourists

from overseas spent on average five to seven days in a month. These were followed by residents from other Africa (four to five days) and SADC countries (two to three days). The data further show that visitors spent fewer days during the winter months of May and June.

4. DISCUSSION

4.1. Cross-Border Regulations (Visas and Permits)

International travellers are required to have visas and permits to cross into foreign countries. Visas and permits are used by destination countries to screen non residents travelling into the foreign countries. The visa status of countries is influenced, among other issues, by the bilateral and multilateral agreements between countries. An individual's choice of country of destination will to a great extent be influenced not only by his/her own interests but also to some extent by the status of his or her country's bilateral relationship with the country of destination.

Besides these *normal* visa and permit regulations, the long period of apartheid rule with restrictions on the movements of certain foreign nationals as a result of the apartheid laws, as well as sanctions imposed by many countries prohibiting its nationals from traveling to South Africa, are widely documented (Byrnes, 1996). Undoubtedly, these travel bans contributed not only to the low and generally stable flow of visitors but more so to the apparent difference in numbers between visitors from overseas and Africa. The published data by Stats SA clearly show that Europe was the leading sub region, with the highest volumes coming from UK and Germany, whilst the United States represented the highest volumes from North America.

The collapse of the apartheid system and the lifting of sanctions gave way to the beginning of "free" travels to South Africa. In addition to non–South Africans taking advantage of the collapse of apartheid, the astronomical increase in the proportion of visitors from Africa observed from 1990 to 1994 could also be attributed to the contribution of South Africans returning home from exile.[4] Since independence, visitor arrivals have continued to grow, but not at the same rate as in the 1990s. The landscape of the regional patterns has also changed, with overseas losing its high position to Africa. Similarly, Europe lost its overall leading subregion role to the SADC subgroup.

South Africa categorises countries as *visa-exempt* and *visa-restricted* countries.[5] The exemption tends to benefit the overseas countries as well as the SADC countries. The low visibility of visitors from other African countries is a reflection, among others, that virtually all of them fall under *visa-restricted* countries, except Gabon and the Cape Verde Islands, whose nationals are granted visa exemption for an intended stay of thirty days or less. In addition to the geographical advantage and the individual bilateral agreements with South Africa, as members of the SADC economic bloc, the neighbouring countries certainly benefit from the various agreements signed

within the bloc, including limited days of free movement for their residents (Madakufamba, 2005).

4.2. Tourism

The second major contributor to the growth of visitor arrivals is tourism. Often described as "a world in one country," South Africa's attractiveness does not only lie in its large population size, estimated at 50.6 million in 2011, but also in its great geographical, social-cultural, environmental, and economic diversity. Tourism has long been an important sector of the economic and social structure of South Africa (Grünthal, 1993). Thus both apartheid and post-apartheid governments have developed, maintained, and improved not only tourist attractions but also world-class infrastructure in systems of transport and telecommunications; a well-established and functioning banking system; and a wide variety of holiday accommodations (hotels, lodges, self-catering, etc.) including huge conference centres, exhibition and sporting facilities, plus medical and security services that support all types of tourism, including the hosting of mega-events, particularly sporting events (Fourie and Santana-Gallego, 2010).

The hosting of the 2010 FIFA World Cup has shown the effectiveness such events can have in drawing visitors from participating and non-participating countries to South Africa (Gumbi and Ubomba-Jaswa, 2011; South African Tourism, 2011). The relevant economic role played by the industry is clearly reflected in its contribution to the direct growth of the economy. For example, in 2009, tourism directly contributed R67.1 billion or 2.8% to GDP and accounted for 4.1% of total national employment (South African Tourism, 2011. It was therefore both logical and justifiable that in 2009, the government assigned a full ministry to be responsible for the tourism industry.

4.3. Transportation

South Africa can be entered by air, land (rail and road), and sea. During the apartheid era, passenger trains were used mainly by residents from Zimbabwe, Mozambique, Namibia, and Botswana. Visitors coming in by rail and sea have been very low and irregular in the post-apartheid period, as this type of transportation is mainly used for freight.

Currently, there are seventy-one ports: eight seaports; ten international airports, and fifty-three land border posts distributed throughout all the nine provinces in South Africa. An excellent road network connects the land border posts that are distributed among all six neighbouring countries as follows: Botswana (16), Lesotho (15), Swaziland (11), Namibia (7), Mozambique (3), and Zimbabwe (1).

The link between aviation and the growth of international visitor arrivals cannot be overemphasised (Appel, 2007). South Africa depends heavily on

air transportation for its long-haul flights from overseas and other African countries. Visitors who use this mode of travel are more likely to have higher purchasing power that enables them to stay longer and make significant use of tourism facilities than visitors from neighbouring countries. These visitors could also take advantage of the close proximity of neighbouring countries and visit them, too, thus contributing not only to the economy of individual countries but to the economy of the SADC region as well.

The demise of apartheid saw a systematic expansion of the aviation industry. South African Airways (SAA) resumed its flights to previously banned destinations. It was also in a position to gain entrance and introduce services into new markets in Africa, Asia, Europe, South America, and North America, as well as to increase its flights and enter into code-sharing agreements and partnerships with other airlines. Currently, SAA flies to thirty-eight destinations worldwide using a fleet of fifty-four Boeing and Airbus aircraft. There has also been an increase in the number of airlines (including low-cost airlines) operating in South Africa on both short-and long-haul flights.

The three major airports are O.R. Tambo, Cape Town, and King Shaka. O.R. Tambo and Cape Town were recently renovated, expanded, and restructured to increase their handling capacity for passengers and cargo. Beside SAA, forty-seven and fifteen international airlines operate at O.R. Tambo and Cape Town, respectively. King Shaka, which has replaced the congested and inadequate Durban International Airport, opened on 1 May 2010. It is worth mentioning that Kruger and Pilanesberg international airports directly serve the two major game parks that bear their names. In 2009, O.R. Tambo was ranked 73 in the world's top 100 busiest airports[6] (the only airport from Africa on the list).

4.4. Demographic Characteristics of Visitors

Sex and age are key demographic selective determinants of population movements. Generally, international voluntary population movements are characterised by more men than women. It is also observed that women migrants tend to move across short distances. This sex selectivity notwithstanding, sex ratio differences do exist among countries. Movements of women have been highly affected by the cultural perceptions (status and role) of women in both the countries of origin and destination.

In countries where the gap in gender "inequalities" appears to be narrow, the sex ratios of the visiting population would be further from 100. The sex ratios can also be influenced by the perception of women and the kind of tourism promoted in the country of destination, because countries that have negative gender socio-cultural and economic "biases" towards women are not likely to attract female visitors. Similarly, the types of tourism promoted in the country of destination tend to have an impact on the sex differentials of receiving countries (Shan, 2011).

South Africa is an "open" society and does not have any apparent social issues that are likely to deter women from choosing to visit. This implies that the determinants of sex selectivity tend to be influenced by individual and country-of-origin factors. As observed from the results, more males than females have been coming into the country since the apartheid era.

However, the gap between males and females has gradually been narrowing. Throughout the five-year period 2005 to 2009, a higher proportion of females was found among residents of SADC countries than overseas and other Africa residents. Are more females visiting from the SADC countries because of their proximity to South Africa? Is the low female presence among the visitors from other Africa a reflection of barriers back home?

Since data on age were not reported until 2005, we could not produce any comparison between the two eras. Data are needed over a period of time in order to pick up any major differences in trends. Nonetheless, the expected pattern of a young adult visiting population was observed. Furthermore, the age distributions of the visiting population of the overseas and Africa regions reflect the expected age structures of old and young populations, respectively. The fact that the overall age distribution is not skewed towards particular age groups indicates that visitors of all ages chose to come to South Africa.

4.5. Purpose of Visit

The purpose of visit is based on the type of temporary residence permit (TRP) the visitor is given at the port of entry before gaining admission to the country. Holders of passports or travel documents of visa-exempt countries are allowed to proceed to the port of entry without a visa, where they are given visitor's TRP if they are found admissible. Holders of passports or travel documents of visa-restricted countries need to obtain a visa at a South Africa consular office before proceeding to the port of entry. A visa is converted into a visitor's TRP if admission is given. Stats SA groups all holders of different categories of visitors' TRPs into the group "holiday." TRPs have duration limits and conditions. The duration of the TRP is linked to the number of days assigned to the nationality of the passport the traveller is using. Currently there are three types of duration (30, 60, and 90 days) allocated to the different visa exempt countries.

There are no exemptions for permits, so all persons intending to study or conduct business need to apply through a consular office for the relevant permit before proceeding to the point of entry. Like visitors' TRPs, business and student permits have durations and conditions. Thus, having a visitor's TRP should not be confused with the concept "visitor," which includes holders of other TRPs such as business and study TRPs. It should be noted that changes in the rules and regulations under the Immigration Act could also affect the categorisation of the purposes of visit, which in turn do impact on the volumes of the groups.

Visitors during the apartheid and post-apartheid eras came to South Africa primarily to visit on holiday (i.e. engage in a wide variety of activities other than to study and do business), consistent with the general pattern shown in most international visitor arrival statistics worldwide. Throughout the period of observation, there were more visitors on business than students. However, sharp declines in business arrivals were observed from 2000 to 2004 compared to the continuous increase in holiday and student arrivals. The change in the regulations and the requirement that foreign business owners invest R2.5 million and employ five South Africans in order to get a business permit that came into effect in July 2004 undoubtedly had a negative impact on the data.

Although the same pattern of very high arrivals on holiday was observed in all three regions, data on other Africa countries showed more diversity in the purpose of visit than SADC and overseas countries. The results indicate that unlike residents from overseas and SADC countries, relatively high proportions of residents of other Africa countries were students and businesspersons. However, all three regions showed a steady increase in the proportion of holiday arrivals, while business and study visits declined during the five-year period. The boom in international student intake in the country's tertiary institutions in the early 2000s, followed by a gradual decline, is an example of the effect changes in national and institutional policies and regulations have on visitors' decisions to travel to a specific country for a specific service (Ubomba-Jaswa and Gae, 2006).

5. CONCLUSION

The availability of the wealth of data stretching over decades provides an opportunity for studies of temporary population movements across South Africa's borders. The focus of this chapter was to find similarities and differences with respect to the numbers and characteristics of international visitors who came to South Africa during the apartheid and post-apartheid periods from 1980 to 2009.

Besides the obvious pull of the tourism industry, the results and discussions of the border statistics show a strong influence of *politics* and legal rules and regulations as the main determinants of the volume and, to some extent, the characteristics of international visitors. The collapse of apartheid ushered in *free* movements into South Africa that have resulted in the huge growth of international arrivals. The drive towards excellence in the various aspects of the tourism industry by both government and the private sector and a generally *generous* immigration policy towards temporary movers, particularly holidaymakers and students, have all contributed towards making South Africa a destination of choice for visitors worldwide.

In addition to the growth in visitor arrivals, immigration regulations regarding visas and permits appeared to have, to a great extent, changed

the international arrivals landscape. As found in the results, Africa overtook overseas after 1990. Likewise, Europe lost its traditional position to the SADC sub-region as the major source of visitor arrivals. Furthermore, despite the greater volumes of these sub-regions, their growth rates have not been as spectacular compared to emerging source sub-regions such as Asia, Central and South America, the Middle East, West Africa, and North Africa.

Air travel was the major mode of travel during the apartheid era until the beginning of the 1990s, when road travel overtook it. The discussions have underscored the remarkable growth in the aviation industry in the post-apartheid era contributing to an increase in short- and long-haul arrival visitors, though the proportion of air arrivals has decreased mainly due to huge road arrivals from neighbouring countries.

Linked closely to the mode of travel is the duration of stay of visitors. The results of the 2009 data clearly indicated that visitors from overseas and other Africa countries spent more days in the country than visitors from the SADC countries. Furthermore, virtually all same-day visitors were road arrivals from neighbouring countries. These aspects of the travel behaviour have generated strong discussions among tourism service providers, particularly concerning the legitimacy of counting the huge number of visitors from the SADC sub-region as *tourists*, as their activities often do not generate crucial jobs and income that contribute to the economy compared to the long-haul visitors, particularly from overseas countries.

With regard to the purpose of visits, the patterns observed in the apartheid period have not changed. An overwhelming majority of visitors continue to be admitted on visitor TRPs compared to study and business TRPs. The slowing down of the high momentum in the early 2000s of student arrivals is of concern because of the considerable contribution towards the economy through the high income generated by international students. Although the investment fund required from applicants in order to obtain a business permit seems exorbitant, it will in a way assist in identifying the true business investors rather than lumping all types of visitors (e.g. conference attendants) together as business arrivals.

One of the lessons learnt from the analysis of data on temporary population movements is the dearth of data on demographic characteristics. As in migration studies, it is crucial to have this basic demographic information so that sex selectivity regarding aspects of the movement such as distance, purpose, and duration of visit can be measured and adequately investigated, also enabling industries to diversify and tailor-make their products to meet the demands of different categories of visitors.

In conclusion, post-apartheid South Africa has maintained its hard-earned democracy with no major natural or man-made disasters as witnessed recently in tourist destinations such as Egypt, Indonesia, Japan, and Mexico that have plummeted visitor arrivals in these and other affected destinations to very low levels (Cornwell and Roberts, 2010; Dixon et al.,

2010; Mao, Ding, and Yu-Lee,2010; Neumayer, 2004). The tourism industry has also grown in all respects; in 2008, South Africa was ranked 25th out of the 903 most visited countries in the world, second only to Egypt among the Africa destinations.

Despite this high position it has acquired, South Africa cannot afford to be complacent. Tourism is a growing, highly competitive industry, and there is a strong global drive encouraging particularly less-developed countries to regard boosting local tourism as a strong mechanism for poverty alleviation. In view of this, marketing to non-traditional source regions (and countries) such as other Africa, Asia, Central and South America, and the Middle East would demand strong communication and collaboration. In view of this, we propose the following additional policy directions that will contribute to increasing visitor arrivals.

Policy Implications:

- Reaching out to non-traditional source regions and countries:

Although the Africa regional economic groupings like the Economic Commission of West Africa States (ECOWAS) and Southern Africa Development Commission (SADC) have their own resolutions and multilateral relationships among member states, there is a need to start looking afresh at population movements on the continent from other perspectives. Movements on the continent do not consist of only refugees, asylum seekers, and legal and illegal migrants but international visitors as well. Restrictions on visas were alleged in the discussion to be a contributory factor in the generally low visibility of other Africa visitors. Perhaps potential tourists from other Africa countries are spending their time and money on holidays or studies and even setting up business outside South Africa or outside the continent. The relatively low percentage of visitors on holiday from these countries was also observed. There is a need to unpack the possible factors for this observation; that will assist in marketing South Africa to other Africa countries as a holiday destination—for example, targeting young adults, because the data show that they are already coming to South Africa.

- Border statistics—reintroduction of cards

South Africa, unlike many countries, collects border statistics electronically and does not use cards or forms. The immense benefits of electronic data cannot be overemphasised. However, because the travel documents are scanned, only limited information on the visitor becomes available. We recommend the reintroduction of embarkation/disembarkation cards to assist in the collection of additional information on visitors, particularly arrivals from *visa-exempt* countries that do not go through any visa application screening formalities. Second, there is a strong demand for other information on visitors by government and private stakeholders relating to the

diversity of purpose of visit, which the current data from DHA cannot provide. As it is currently, we cannot differentiate between visitors who have come for medical consultation and those who are attending a music festival.

NOTES

1. The details of all the immigration acts and amendments are available at the Department of Home Affairs website: www.dha.gov.za.
2. The visitor's TRP should not be confused with the concept "visitors," which is the broader group of temporary movers under discussion. The DHA gives a visit not a holiday or tourist visa. In this chapter, the visit TRP will be referred to as Holiday TRP.
3. (For example a student finishing studies and acquiring a work permit.)
4. A number of them were UN refugees or had acquired nationalities from other countries.
5. A comprehensive list of the countries is given at the DHA website: www.dha.gov.za.
6. The only airport in Africa on the 2007 list.

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9 Household and Family Dynamics in South Africa

Tapiwa Jhamba and Kerotse Mmatli

1. INTRODUCTION

Families and households are separate but related entities which form the nucleus of communities and regulate domestic relations and other aspects of human existence in society. Families are characterised by their relationships through kinship, marriage, or adoption, and membership is derived through relationships with other members. Definition of household centres on common provision of food, for example, from a common granary, or use of a common hearth or cooking pot, or all members looking to the same person as their household head (Hosegood, 2008). Membership in a household is derived through shared residential and economic (consumption) arrangements.

The structure of families and households is affected by a combination of demographic, cultural, and economic factors linked to family and household composition. Basic demographic processes such as fertility, nuptiality, and mortality determine the age structure of a population, as well as the number and types of "available kin" with whom an individual might share a residential unit (Fields and Casper, 2001; Kalule-Sabiti et al., 2007). Fertility changes directly affect numbers of children per household, while mortality, especially due to HIV and AIDS, directly affects household size, age composition, and headship. Marriage is also directly linked to family and household formation. In the African context, marriage comes with certain collective responsibilities which include care and support of the extended family members (Siqwana-Ndulo, 1998). In developing countries, migration of adult household members, mostly in search of employment, affects household composition in both rural and urban areas.

Cultural factors determine acceptable conditions under which new households and families are formed in line with various life-cycle stages such as employment, marriage, parentage, divorce, and so on (Santi, 1988). In developing countries, households comprising extended relatives are common due to the "communalist ethos" or a culture of living collectively (Amoateng et al., 2007). However, modernization through, for example, increased schooling may break down traditional values and norms, including family values,

which, for example, entail a specific obligation for children to support and care for their elderly parents (UN, n.d.). Also, as noted by De Vaus (2002), modernisation and changing social standing of women have led to rapid changes in marriage patterns, with increasing proportions of women marrying later or not marrying at all, a rise in cohabitation, and an increase in single parenthood.

From an "economic" perspective, increases in residential independence and establishment of new households are a consequence of rising incomes (Beresford and Rivlin, 1966; Carliner, 1975; Michael, Fuchs, and Scott, 1980). Residential independence (or "privacy") is viewed as a valued "good" which individuals will consume in proportion to their ability to pay for it. Stack (1974), cited in Amoateng and Richter, 2007), also argued that among Africans, for example, the formation of complex households was as much a function of poverty as it was of culture. According to (Schmink, 1984), studies in Latin America have also shown that relatives often end up coresiding and thus forming complex households, because they cannot afford to live separately. In South Africa, the period following transition to democracy in 1994 witnessed, among other things, extension to the Black population of social security in the form of grants to older persons, children, and the disabled. The additional income, in the form of government grants, has been associated with modification of living arrangements (Edmonds et al., 2001).

The relative importance of the various perspectives in explaining changes in the size and composition of households varies among societies depending on cultural and economic conditions.

The aim of the study is to contribute to increased understanding of household patterns, trends, and variations in South Africa. The specific objectives are to describe patterns and trends of household types and characteristics, to examine variation in household characteristics and family living arrangements, and to identify the main demographic and socioeconomic factors that affect the likelihood of living alone and the likelihood of heading a multiperson household.

2. DATA AND METHODS

The study utilises micro data from 10% samples of the 1996 census and 2001 census as well as data from the 2007 Community Survey obtained from Statistics South Africa. Statistics South Africa defines a household as "a group of persons who live together and provide themselves jointly with food and/or other essentials for living, or a single person who lives alone" (Statistics South Africa, 2009, p. 3). The focus of the study was on private households and persons that were enumerated in private households and excludes institutions such as prisons, hospitals, schools, hotels, homes for the aged, hostels, and the like. People who lived as separate households within institutions were, however, enumerated as households.

The censuses enumerated all persons who stayed the enumeration night in the household whether or not they were usual members of the household (de facto household members), while the Community Survey enumerated all usual members of the household: members who usually stayed in the household for at least four nights a week, whether or not they stayed enumeration night in the household (de jure members), as well as any visitors that stayed the enumeration night in the household. Ninety-nine percent of household members enumerated in the 2007 Community Survey were both de-jure and de-facto members. To facilitate direct comparison with results from the 2001 and 1996 censuses, de-facto membership is analysed for the 2007 Community Survey, and the sample data were also de-facto weighted.

The data presented in much of this report were weighted to estimated population totals using weights provided with the data by Statistics South Africa. This is to facilitate comparison among the three sources as well as comparison with already published results from these data sources. However, regression analysis based only on the 2007 Community Survey used un-weighted data, as weighting the data would unduly influence tests of significance. Though the study is largely descriptive in nature, binary logistic regression was used to predict the effects of sociodemographic factors on the likelihood of living alone and the likelihood of heading a household. Details of the regression technique are given in the relevant section.

3. RESULTS

3.1. Household Headship

According to Statistics South Africa (2007), the head of household is defined as the main decision maker, or the person that the household members consider to be the head. If two people are equal decision makers, or in a household of totally unrelated persons, the older or oldest is considered as the household head. Earlier studies noted that many of the child household heads were a result of errors in data on age (Madhavan and Schatz, 2007; Monasch and Boerma, 2004; Wittenberg and Collinson, 2007). In this study, all ages of heads of household under 10 years were coded to "system missing."

Table 9.1 shows that household headship is male dominated, with about 60% of households being headed by males and only 40% headed by females, with only minor changes between 1996 and 2007. A relatively small proportion of households were headed by children under 18 years, the proportion decreasing from 1.1% in 1996 to 0.6% in 2007. In 2007, about 15% of the households were headed by older persons (aged 65 years and above), and the proportion changed only slightly from 14% in 1996 and 13% in 2001.

Table 9.2 shows that the proportion of household heads aged under 18 years was higher among female household heads than among males for

Table 9.1 Percentage distribution of households by type of headship, South Africa 1996–2007

Headship	1996	2001	2007
% male headed	62.13	57.4	59.77
% female headed	37.87	42.6	40.23
% child headed (< 18 years)	1.1	0.87	0.55
% elderly headed (male and female)	13.59	13.4	14.83

Table 9.2 Household headship by sex, age group, population group, and type of household, South Africa 1996–2007

	1996		2001		2007	
	M	**F**	**M**	**F**	**M**	**F**
% of household heads aged under < 18 years						
All	**0.81**	**1.58**	**0.74**	**1.06**	**0.52**	**0.59**
Black	1.14	1.82	0.99	1.21	0.69	0.67
Coloured	0.35	0.64	0.23	0.33	0.14	0.23
Indian	0.14	0.44	0.12	0.32	0.03	0.19
White	0.10	0.21	0.05	0.15	0.05	0.09
% of household heads aged 65+						
All	**10.74**	**18.26**	**10.33**	**17.53**	**11.04**	**20.48**
Black	10.56	17.04	9.48	16.70	9.93	19.86
Coloured	7.18	15.96	7.91	15.48	9.34	18.31
Indian	6.51	12.86	8.30	14.85	9.51	22.10
White	13.72	31.00	15.93	28.51	16.93	28.65
% population aged 18 years and above heading a household	**55.54**	**27.77**	**52.83**	**31.95**	**54.00**	**30.88**

all three periods. Child household headship was highest among Black Africans, followed by Coloureds and lowest among White and Indian/Asian heads. Female household heads were more likely to be elderly than males, and this was the case for 1996, 2001, and 2007 for all population groups. Table 9.2 also shows that the proportion of elderly heads (for both males and females) was higher among White household heads than other population groups, and the pattern was consistent in 1996, 2001, and 2007.

In general, adult males (aged 18 years and above) were more likely to be heading households than were adult females. Table 9.2 shows that more than half of adult males headed a household compared to less than a third of adult females, with only minor differences from 1996 to 2007.

3.2. Household Size and Composition

Table 9.3 shows that the average number of persons per household decreased by 10% from 4.29 in 1996 to 3.82 in 2007. Analysis of age components shows that the decrease was mainly a result of a decline in the numbers of children. In 1996, there were on average 1.76 children per household, and this decreased by 18% to 1.44 in 2007. The average numbers of adults (18–64) decreased only slightly between 1996 (2.28) and 2007 (2.18), whilst the average number of older persons remained basically unchanged over the period at about 0.20 (Table 9.3).

Table 9.3 also shows that rural households were, on average, larger and had higher average numbers of children and older persons than urban households. For all three periods, the average number of children in rural households exceeded that in urban households by more than 70%. Similarly, the average number of elderly persons in rural households exceeded that in urban households by more than 50%.

Table 9.3 Average number of persons per household by age component and rural/urban residence, South Africa 1996–2007

Age component and rural/urban residence	**1996**	**2001**	**2007**
All persons			
Urban	3.83	3.51	3.49
Rural	4.99	4.36	4.44
Total	4.29	3.87	3.82
Children (under 18 years)			
Urban	1.31	1.17	1.13
Rural	2.43	2.02	2.02
Total	1.76	1.52	1.44
Elderly persons (65 years and above)			
Urban	0.17	0.15	0.17
Rural	0.26	0.25	0.27
Total	0.21	0.19	0.20

Note: Sum of age components may differ from total due to cases with missing information on age.

3.3. Single and Multiperson Households

The smallest and simplest household consists of one member living alone. Nationally, the proportion of single person households varied slightly from 16% in 1996 to 18% in 2007. The proportion was slightly higher in urban than in rural areas. However, in rural areas, the proportion of single-person households increased steadily from 13.7% in 1996 to 16.2% by 2007, whilst in urban areas, it fluctuated between 18% and 20%. Figure 9.1 shows that at provincial level, the proportion of single-person households increased markedly from 1996 to 2007 in North-West Province, Free State, Mpumalanga, and Limpopo, while the other provinces experienced only minor fluctuations.

Males were more likely to live alone than females, with the proportion of adult males (18 years and above) living alone or heading a single-person household increasing from 7.7% in 1996 to 10.8% in 2007. On the other hand, the proportion of females living alone remained at less than 5% over the same period.

The average size of multiperson households decreased slightly from 4.65 in 1996 to 4.41 in 2007, a decrease of 5.2% over the ten-year period. On average, multiperson households in urban areas were smaller than those in rural areas. Whilst the average size of urban multiperson households decreased linearly from 4.22 in 1996 to 4.07 by 2007, in rural areas, the average size of multiperson households increased continuously from 1996 to 2007. Thus, the difference in the average size of urban households and rural households has widened over time.

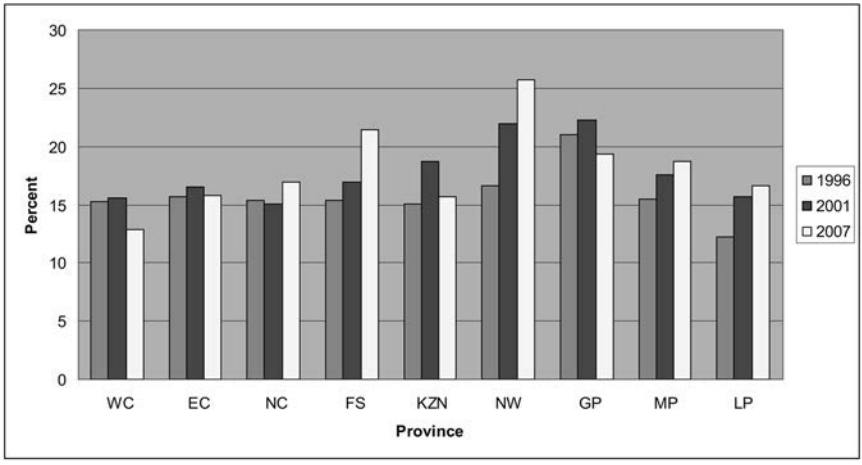

Figure 9.1 Percentage distribution of households with single persons by province, South Africa 1996–2007

3.4. Household Complexity

Based on family member composition, multiperson households are classified as nuclear households, complex/extended, or nonrelated person households. A simple nuclear household consists of parents and their children and no other relatives of the head and no nonrelatives, while a complex household includes nuclear and nonnuclear members. Complex households can be created by vertical extension through addition of members of more than one generation, such as grandparents and grandchildren, or by horizontal extension through addition of siblings and their spouses and children (Bongaarts, 2001). More complex households result from inclusion of more distant relatives as well as individuals unrelated to the head of household. Bongaarts (2001) noted that, although a variety of schemes for classifying households by type of family composition have been proposed, there is no widely accepted and used approach. The nature and type of data available determine the extent of the complexity classifications.

In this analysis, given the nature of the Community Survey and census data, only a limited range of dimensions of household complexity could be examined. The analysis follows the approach proposed by Burch (1967) and used by Bongaarts (2001) whereby individual household members are classified into four family categories based on relationship to head of household as follows: nuclear family: head, spouse, and children (including adopted and stepchildren); stem family (parents, grandparents, grand-/great-grandchildren of head); other family (any other relatives of head such as brother, sister, parent-in-law, son/daughter-in-law, brother/sister-in-law, other relative); nonfamily (any individuals not related to head)

However, because the analysis is based on information on characteristics of individuals and not characteristics of households, it should be noted that such estimates are not directly comparable with estimates of household complexity obtained with other approaches, especially those based on characteristics of households (Bongaarts, 2001).

The 2001 census did not completely conform to this typology in terms of stem families, as grandparents were not recorded as a separate category but were instead included in the category "other family relatives." The analysis of type of family membership in this section is limited to multiperson households. The nuclear family membership predominated in all households, with about 77% of household members being nuclear family in 1996 and the proportion decreasing to 72% in 2001 and 2007. The proportion of stem family members (parents, grandparents, and great-/grandchildren) increased slightly from 14% in 1996 to 16% in 2007, and the proportion of nonfamily members decreased from 2% in 1996 to less than 1% by 2007.

Table 9.4 shows in-depth analysis of variations in the average size of family components and the ratios of the family components to household size by selected characteristics of head of household for the 2007 Community Survey. The average size of multiperson households was highest among

Table 9.4 Average size of residential family units and ratio of family components to household size for multiperson households by selected characteristics of head: 2007 Community Survey

	Average size				Ratio to household			
	Nuclear	Nuclear/ stem	All families	House-hold	Nuclear	Nuclear/ stem	All families	House-hold
Pop Group								
Black	3.18	4.05	4.62	4.65	0.68	0.87	0.99	1.00
Coloured	3.39	3.99	4.47	4.54	0.75	0.88	0.98	1.00
Indian or Asian	3.33	3.65	4.03	4.07	0.82	0.90	0.99	1.00
White	2.83	2.93	3.10	3.17	0.89	0.93	0.98	1.00
Sex								
Male	3.41	3.84	4.24	4.29	0.80	0.90	0.99	1.00
Female	2.87	4.00	4.59	4.63	0.62	0.86	0.99	1.00
Residence								
Urban	3.09	3.57	4.01	4.06	0.76	0.88	0.99	1.00
Rural	3.36	4.54	5.08	5.10	0.66	0.89	1.00	1.00

households headed by Black Africans (4.65 members), followed by households headed by Coloureds (4.54), and was lowest in households headed by Whites (3.17). However, examination of nuclear family components reveals that this was highest in households headed by Coloureds (3.39), followed by households headed by Indians/Asians (3.33), and was lowest in households headed by Whites (2.83). The proportion of nuclear family members varied from 68% in households headed by Blacks to 89% in households headed by Whites.

The increase in the average family size due to addition of parents/grandparents or grand-/great-grandchildren members was highest in households headed by Black Africans (0.87) and was lowest in households headed by Whites (0.10). This implies that households headed by Black Africans included the highest average number of stem family members (parents, grandparents, and grand- and great-grandchildren when compared to households headed by other races. The average number of stem family members was lowest in households headed by Whites. Across all population groups, the proportion of nonfamily household members was very low, 2% or less.

Although overall, female-headed households were larger than male-headed households, male-headed households tended to have a higher

proportion of nuclear members compared to households headed by females. Table 9.4 shows that nuclear members constituted 62% of the overall size of female-headed households compared to 80% of male-headed households. Female-headed households had a higher average number of stem family members (parents, grandparents, and grandchildren of the head) than male headed households. Addition of stem family members to the nuclear members increased the average size of the family by 0.43 members in male-headed households and by 1.13 members in female-headed households.

Table 9.4 also shows that the average size of the nuclear component of households was higher in rural (3.36) than urban areas (3.09). The addition of parents or grandchildren yields the average size of the nuclear/stem family, which exceeds that of the nuclear family alone, adding 0.48 members in urban areas and 1.18 in rural areas in comparison to an average of 0.73 nationally. In both rural and urban households, on average, nearly all household members were family members, as shown by the closeness of the average size of all families component to the overall household size (a ratio of 0.99 and 1.00 in urban and rural areas).

3.5. Household Membership and Family Coresidence

This section uses information on household membership of spouses and parents of household members to examine living arrangements by looking at spousal and parent–child coresidence and variations by selected background characteristics.

3.5.1. Spousal Coresidence

The majority of married persons were enumerated in the same household as their spouse/partner, or coresided. The proportion increased slightly from 83% in 2001 to 85% in 2007. Variations in coresidence existed by population group. Nearly all (97%) married Whites coresided with spouse compared to about 94% of Coloureds and Indians/Asians and 80% of Black Africans. Coresidence was highest among those in a relationship where they lived together as husband and wife without being formally married, followed by those in civil/religious marriages, and was lowest among those in traditional marriages. This pattern was consistent in 2001 and in 2007.

Overall, a large majority of married persons were enumerated in a household headed by themselves or by their spouse. Less than 5% of married persons who coresided with spouse did so in a household "headed by a person other than themselves or their spouse." The proportion of married persons who coresided with spouse in a household headed by a person other than themselves or their spouse was substantially higher among Indians/Asians (about 12%) than other population groups (less than 7%). Whites were least likely to be coresiding with a spouse in a household headed by neither them nor their spouse (3%).

3.5.2. Parent–Child Coresidence

Coresidence with mother was more common than coresidence with father and, as expected, coresidence with parents decreased with age group. Whilst more than 70% of children under 18 years coresided with their mother the proportion decreases with age of member, to less than 10% among those aged 65 years and above. Similarly, the proportion coresiding with the father decreased from 47% among children under 18 years to less than 2% among the elderly aged 65 years and above. The results were generally consistent for 2001 and 2007.

The table also shows that among children aged under 18 years, with both parents known to be alive, only 42% in 2001 and 43% in 2007 coresided with both parents, about a third (31% in 2001 and 35% in 2007) coresided with their mothers only, whilst less than 6% lived with their fathers only, and 21% in 2001 and 18% in 2007 coresided with neither parent. However, substantial variations exist by population group, with more than 80% of Indian/Asian and White children coresiding with both parents, compared to less than 40% of Black African children and about 56% among Coloured children. On the other hand, the proportion coresiding with neither parent was highest among Black Africans, followed by Coloureds. Thus, White and Indian/Asian children were more likely to be staying with both parents, whilst Black African children were more likely to stay with neither parent or with their mothers only.

The proportion of adults aged 25 years and above who coresided with their mother varies by sex, population group, and marital status. About a third of adult Black African, Coloured, and Asian males coresided with their mothers compared to only 13% of adult White males. The proportion of adult females coresiding with mother was lowest among Whites (12%), followed by Indian/Asians (22%), and was highest among Coloureds (31%). Thus, adult White males and females were least likely to coreside with their mothers compared to other population groups. Sex differences in proportions of adults coresiding with mother were highest among Indians/Asians, where the proportion coresiding with mother for males exceeded that for females by 52%. For Black Africans, Coloureds, and Whites, the proportions of adults coresiding with mother were generally similar for males and females.

Marital status is associated with substantial differences in the likelihood of coresiding with mother. Among both males and females, coresidence with mother was highest among the never married, followed by the widowed/divorced, and was lowest among the married adults. Whilst the proportion of the never married coresiding with mother was similar for males and females, the proportion of married adults coresiding with mother was higher among males (8%) than females (4%). Similarly, the proportion of the widowed/divorced/separated who coresided with their mother was higher among males (31%) than females (20%). Substantial variations in proportions coresiding with mother between males and females by population group exist. Indian and Coloured never-married adults (both males and females)

aged 25 years and above were more likely to coreside with their mothers than Whites and Black Africans. Amongst married adults, similar proportions of males and females coresided with mother for Whites (about 4%) and Coloureds (about 8%), whilst among Black Africans and Indians, the proportion coresiding with mother for males exceeded that of females by 181% and 112%, respectively. Amongst formerly married adults, the proportion coresiding with mother was substantially higher for Black African, Coloured, and Indian males than females, whilst for Whites, the difference between males and females was negligible (25% and 23%, respectively).

When adult children coreside with their parents, usually, the parent or the child is head of household. In cases where the adult child is head of household, the parents are often dependent on the adult children, and in cases where the parent is head of household, the adult child is dependent on the parent. Among Whites, a large majority (over 60%) of married adult children who coresided with their mothers were either head of household or their spouse headed the household. The corresponding proportion was less than 30% amongst the other population groups. Among Black Africans, Coloureds, and Indians/Asians, more than two thirds of married adults aged 25 years and above who coresided with their mother were sons/daughters of the household head—that is, they resided in a household headed by their parent. Thus, married Whites who coresided with their mothers were likely to be heads of the households or spouses of the head, whilst Black Africans, Coloureds, and Indians/Asians were likely to be children of the head.

Among never-married adults aged 25 years and above who coresided with their mothers, more than 90% were sons/daughters of the head. This pattern was similar across the different population groups. Among widowed, separated, and divorced adults aged 25 years and above who coresided with their mother, more than two thirds were sons/daughters of the head, with minor variations by population group. The proportion of widowed, divorced, or separated adults (males and females combined) aged 25 years and above who coresided with their mother and were head of household varied from 13% among Coloureds to 29% among Whites. Thus adult Whites (25 years and above) who were divorced, widowed, or separated and who coresided with their mothers were more likely to be head of household than other population groups.

3.6. Multivariate Analysis of Factors Associated with Living Alone and Heading a Multiperson Household

In this section, the effects of selected sociodemographic factors on the likelihood of living alone and likelihood of heading a multiperson household are examined using multivariate logistic regression. To facilitate in-depth analysis of gross and net effects as well as analysis of separate models for males and females, only the 2007 Community Survey is used for the logistic regression. The equation of the logistic curve describing the probability of

living alone or heading a multiperson household (p) given a set of independent variables X_1, X_2, up to X_k is of the general form:

$$p = e^{\left(a+\sum b_i X_i\right)} \Big/ 1 + e^{\left(a+\sum b_i X_i\right)}$$

The terms α and β represent unknown parameters that need to be estimated based on data obtained on the Xs and on the household headship outcome (in this case, whether the person lives alone or is head of a multiperson household) for a group of household members. A logit transformation can be performed by taking natural logarithms as follows:

$$logit\left(p\right) = ln\left(p/1-p\right) = \alpha + \sum b_i X_i$$

The logit transformation thus linearises the equation and gives it many of the properties of a linear regression model (Hosmer and Lemeshow, 1989, p. 7). The quantity (p/1–p), whose log value gives the logit, describes, in this case, the odds of living alone or heading a multiperson household for persons with characteristics X_1 to X_k.

The logit models were run separately for males and females and were limited to adults aged 18 years and above, as the proportion of children heading households was very low. The analysis examined first the gross effects of each predictor variable when considered alone and then the net effects after taking into account the other variables in the model.

The tables display the regression coefficients, odds ratios, significant tests, and the R-square and model Chi-square statistics for the net effects models. The significance of the Chi-square statistics at the bottom of the net effects models corresponds to a research conclusion that there is adequate fit of the data to the model, meaning that at least one of the predictors is significantly related to the response variable (living alone or heading a multiperson household). The R-square values are pseudo-estimates of the variance in the dependent variable explained by the model (SPSS, 1999).

Predicting the Likelihood of Living Alone

Table 9.5 also shows the regression results for predicting the odds of living alone. The R-square values show that marital status, age, population group, work status, and place of residence together explain about 16% of the variance in the likelihood of living alone among both males and females. The gross and net effects of marital status show that for both males and females, the likelihood of living alone was lowest among the married. When marital status is considered alone, the odds of living alone were highest among the widowed/divorced and separated, and this was true for both males and females. However, after considering the other variables in the model, for males, the odds were still highest among the widowed/divorced and separated, whilst for females, the net effects model shows that the odds of living alone were slightly higher among the never married than the widowed/divorced and separated.

Table 9.5 Logistic regression models predicting the odds of living alone in South Africa, 2007

	Male				Female			
	Gross effects		Net effects		Gross effects		Net effects	
Variable	B Coefficient	Odds ratio	B Coefficient	Odds ratio	B Coefficient	Odds ratio	Coefficient	Odds ratio
Marital status								
Married	Ref	1.00	Ref	1.00	Ref	1.00	Ref	1.00
Never married	0.74	2.09*	1.58	4.83*	1.62	5.07*	2.27	9.71*
Wid/Sep/Div	1.91	6.77*	2.30	9.96*	2.32	10.20*	2.17	8.78*
Age group								
18–34	–0.11	0.89*	–1.02	0.36*	–1.06	0.35*	–1.47	0.23*
35–54	0.27	1.30*	–0.20	0.82*	–0.69	0.50*	–0.90	0.41*
55+	Ref	1.00	Ref	1.00	Ref	1.00	Ref	1.00
Population group								
Black	Ref	1.00	Ref	1.00	Ref	1.00	Ref	1.00
Coloured	–1.16	0.31*	–1.40	0.25*	–0.71	0.49*	–0.79	0.45*
Indian/Asian	–1.82	0.16*	–2.03	0.13*	–0.53	0.59*	–0.46	0.63*
White	–0.68	0.51*	–0.95	0.39*	0.79	2.21*	0.88	2.41*
Work status								
Employed	Ref	1.00	Ref	1.00	Ref	1.00	Ref	1.00
Not employed	–0.85	0.43*	–1.42	0.24*	–0.85	0.43*	–1.15	0.32*

(*Continued*)

Table 9.5 (Continued)

	Male				Female			
	Gross effects		Net effects		Gross effects		Net effects	
Variable	**B Coefficient**	**Odds ratio**	**B Coefficient**	**Odds ratio**	**B Coefficient**	**Odds ratio**	**Coefficient**	**Odds ratio**
Residence								
Urban	Ref	1.00	Ref	1.00	Ref	1.00	Ref	1.00
Rural	0.01	0.99	–0.05	0.95*	–0.27	0.77*	–0.14	0.87*
Constant			–1.67				–3.19	
R-square (Nagelkerke)			0.169				0.164	
Chi-square			23041**				15442**	

Models based on unweighted sample data
*Significantly different from the reference category at the 1% level
**Model significant at 1% level

Table 9.5 shows that for males, when age is considered alone, the likelihood of living alone was highest among adults aged 35 to 54 years, but after taking into account marital status, population group, work status, and residence, the net effects model shows that the likelihood of living alone was highest among older persons aged 55 years and above and was lowest among those aged 18 to 34 years. The odds of living alone for young males (18–34 years) were only 36% of those for older males aged 55 years and above (net effects model). For females, however, both the gross effects and net effects models show that the likelihood of living alone was highest among older women aged 55 years and above and lowest among those aged 18 to 34 years.

Variations in the odds of living alone by population group show interesting differences between males and females. For males, the odds of living alone were highest among Black Africans, followed by Coloureds, and were lowest among Indians/Asians (gross and net effects). For females, however, the odds of living alone were highest among Whites (exceeding the odds for Blacks by more than 100%) and were lowest among Coloureds. Thus there appear to be some gender dynamics associated with living alone which vary by population group. As would be expected, employed persons were more likely to live alone than those not employed. Employed persons were those who were in paid employment, whilst the "not employed" included the unemployed and those not economically active. Thus those who earned a wage/salary were more likely to live alone than those who did not. The effect of place of residence on the odds of living alone was the same in the gross and net models, as well as for males and females. Living in rural areas was associated with slightly lower odds of living alone.

Predicting the Likelihood of Heading a Multiperson Household

Table 9.6 shows the regression results for models predicting the odds of heading a multiperson household. When considered together, marital status, age group, population group, work status, and place of residence accounted for about two thirds (66%) of the variation in the likelihood of heading a multiperson household among males and slightly more than a third (38%) of the variation among females. Among females, the pattern of variation in the likelihood of heading a household was the same in the gross and net effects models for all variables. Being widowed, divorced, or separated increased the odds of heading a household more than thirteenfold even after controlling for the other factors. The odds of heading a household for younger women (aged 18–34 years) were only 12% of those for women aged 55 years and above (net effects model). Black African women were the most likely to head a multiperson household, followed by Coloured women, whose odds were half of those for Black African women, whilst White women were the least likely, with odds that were less than a quarter (23%) of those for Black African women. Being in paid employment was associated with significantly higher odds of heading a

Table 9.6 Logistic regression models predicting the odds of heading a multiperson household, South Africa, 2007

	Male				Female			
	Gross effects		Net Effects		Gross effects		Net effects	
Variable	B Coefficient	Odds ratio	B Coefficient	Odds ratio	B Coefficient	Odds ratio	Coefficient	Odds ratio
Marital status								
Married	Ref	1.00	Ref	1.00	Ref	1.00	Ref	1.00
Never married	–3.91	0.02*	–3.09	0.05*	0.24	1.28*	0.92	2.50*
Wid/Sep/Div	–1.18	0.31*	–1.37	0.26*	2.89	17.98*	2.60	13.42*
Age group								
18–34	–3.05	0.05*	–1.99	0.14*	–2.25	0.11*	–2.09	0.12*
35–54	–0.78	0.46*	–0.89	0.41*	–0.74	0.48*	–0.44	0.64*
55+	Ref	1.00	Ref	1.00	Ref	1.00	Ref	1.00
Population group								
Black	Ref	1.00	Ref	1.00	Ref	1.00	Ref	1.00
Coloured	0.18	1.20*	–0.57	0.56*	–0.46	0.63*	–0.69	0.50*
Indian/Asian	0.40	1.49*	–0.74	0.48*	–0.99	0.37*	–1.38	0.25*
White	1.12	3.06*	–0.22	0.81*	–1.08	0.34*	–1.48	0.23*

Work status								
Employed	Ref	1.00	Ref	1.00	Ref	1.00	Ref	1.00
Not employed	–1.33	0.26	–1.03	0.36*	–0.17	0.84*	–0.54	0.58*
Residence								
Urban	Ref	1.00	Ref	1.00	Ref	1.00	Ref	1.00
Rural	0.68	1.97	–0.14	0.87*	0.32	1.37*	–0.10	1.11*
Constant			3.40				–0.26	
R-square (Nagelkerke)			0.66				0.38	
Chi-square			155506**				89104**	

Models based on unweighted sample data
*Significantly different from the reference category at the 1% level
**Model significant at 1% level

multiperson household. The net effects model for females shows that the odds of heading a multiperson household for rural women exceeded those for urban women by 11%.

For males, unlike for females, the likelihood of heading a multiperson household was highest among those who were married and lowest among the never married. Table 9.6 shows that the likelihood of males heading a multiperson household increased with age, as it did for females. When considering population group alone, the odds of males heading a multiperson household were highest among Whites, followed by Indians/Asians, and were lowest among Blacks. However, after taking into account the effects of marital status, age group, work status, and place of residence, the likelihood of males heading a household was highest among Black Africans, followed by Whites, and was lowest among Indians/Asians. For both males and females, the odds of heading a household were higher among the employed compared to the unemployed. The gross effects model in Table 9.6 shows that rural males were almost twice as likely to head a multiperson household as their urban counterparts. However, after taking into account the other variables, the likelihood of heading a household was higher among urban males than rural males (net effect model).

4. DISCUSSION AND CONCLUSION

Household headship varied by sex, with 40% of households headed by females and 14% headed by the elderly. The proportion of elderly heads was higher among female than male household heads and among Whites than other population groups. This may partly be reflective of the higher life expectancy of females compared to males and of Whites compared to other population groups. It may also be argued that elderly females are likely to be widowed and remain as heads of their households after the death of their spouse and possibly take in grandchildren, whilst males are more likely to remarry or move in with family. Cultural factors also come into play where an elderly person may remain a ceremonial head, even if the household is run by a younger person. Also, as noted by Edmonds and colleagues (2001), access to social grants by the elderly (especially women) increases their likelihood of heading a multiperson household. They observed an increase in the number of children in a household headed by the elderly once the elderly head becomes eligible for social grants.

Results from logistic regression revealed that widowhood, separation, divorce, and never marrying were associated with increased female household headship. These findings are consistent with the observation in Uganda by Ntozi and Zirimenya (1999) that households headed by married women were uncommon. Joshi (2004) further argued that female-headed households are generally formed in the event of the disruption of the "standard life-cycle," through, for example, never marrying, death of a spouse, or

migration of a spouse. Also, because of existence of well-defined cultural norms dictating that the man is the head of household, households may tend to be identified as female-headed only when the demographic head (a male) is either deceased or has migrated away as noted by Rosenhouse (1989) and Kennedy and Peters (1992).

Although child-headed households are one of the most widely discussed social consequences of the HIV epidemic in Southern Africa, evidence from this study showed that both the proportion of children under 18 years who headed households and the proportion of households headed by children under 18 years were generally very low and decreased from 1996 to 2007. The small proportion of households headed by persons under 18 years may be a result of the role played by the extended family system, as noted by Ntozi and Zirimenya (1999) and Ford and Hosegood (2005). Although the proportion of child-headed households is low, it must be noted that the numbers involved are substantial and a cause for concern in terms of child rights and welfare.

The average size of private households decreased steadily from 1996 to 2007, reflecting mainly the effects of the decrease in the average number of persons under 18 years. The decline in the average number of minors in South African households may be a reflection of fertility decline. Fertility in South Africa declined from an average of 4 to 5 children per woman in the 1980s to about 3.3 children per woman in the mid 1990s (Moultrie and Timaeus, 2003; Palamuleni et al., 2007). Fertility was estimated at 2.84 children per woman from the 2001 census and 2.80 children per woman from the 2007 Community Survey (Statistics South Africa, 2010). Female-headed households were, on average, larger than male-headed households and also had a higher average number of persons under 18 years as well as older persons. Female-headed households also had higher average numbers of adult children, stem family members, and nonnuclear members such as siblings than male-headed households.

Rural households were, on average, larger than urban households and had more minors and the elderly per household than urban households. The findings are consistent with what would be expected in countries with significant rural-to-urban migration. The substantially higher number of grandchildren in rural than urban areas may also indicate the practice of letting children live with grandparents in the villages whilst the parent(s) live and work in urban areas.

The odds of living alone varied significantly by population group, sex, marital status, and rural/urban residence and appear to be influenced by economic and cultural circumstances. Analysis of household relations revealed that households comprised mostly members that are related, with composition varying by population group of household head. White households were more nuclear than Black African households, and Black African households included substantially higher proportions of stem family members. Differences in household family composition by population group may

be attributed to differences in marriage, divorce, and childbearing as well as differences in norms regarding coresidence with relatives. It must also be noted, however, that in addition to the "communalist ethos" promoting complex households among Blacks as argued by Amoateng and colleagues (2007), poverty and financial incapacity to live alone may also be contributing to the relatively high proportion of stem and other extended family members in Black households.

Although the majority of married persons were enumerated in a household headed by themselves or by their spouse, coresidence with spouse was substantially lower among Black Africans compared to the other population groups. This may be related to higher rates of migration among Blacks than other population groups as well as higher prevalence of traditional marriages in this population group. The proportion of married persons who lived in a household headed by a person other than themselves or their spouse and coresided with their spouse was highest among Indians/Asians and was lowest among Whites. Analysis of parent–child coresidence revealed that among married adult Indians/Asians, males were substantially more likely to coreside with parents than females, while for the other population groups, the proportions coresiding were the same for males and females. Amoateng and colleagues (2007, p. 51) argued that Asian and especially Indian communities show evidence of the joint family system characterised by a high prevalence of three-generational households. This family system is such that two or more brothers, their wives, and children live together in the same household and sometimes with their aging parents.

While White and Indian/Asian children were more likely to coreside with both parents, Black African and Coloured children were more likely to be coresiding with only their mother. This may be a reflection of sociocultural differences in marriage, single parenthood, living arrangements, and child-rearing practices among the different population groups. Coresidence with parents is important in the socialization of children in preparation for adult life.

In conclusion, results of the analysis of the two censuses and the community survey showed changing trends in household headship, size, and age composition and in family composition from 1996 to 2007. Variations in household characteristics such as headship, size, composition by sex, population group, age group, marital status of head, and rural/urban residence were noted. The role of sociocultural differences in explaining variations in household characteristics by population group was also noted. Variations in spousal and parent–child coresidence patterns and the likelihood of living alone were also linked to population group, age group, and marital status. Historical processes which include high levels of migration among South African Black Africans, mainly in search of economic opportunity, have resulted in situations in which many married couples as well as children and parents live apart. In order to understand better the dynamics of household demography in South Africa, it is necessary to undertake more

detailed studies (including qualitative) that take into account sociocultural, demographic, and historical factors.

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10 Trends and Determinants of Educational Attainment of South African Youth

Mandla Gilimani, Kwena Marevhula, and Isabelle Schmidt

1. INTRODUCTION

The main aims of the educational policies introduced after 1994 were to address equity in education and provide access for all, to redress inequalities caused by past policies, and to improve quality and efficiency in education (Kanjee et al., 2008). Some of the issues addressed by the new education policies include early childhood education and adult basic education and training; the provision of physical infrastructure for education; feeding schemes at schools, introduced primarily to encourage children to attend regularly and continue for longer in school; the provision of learner support material for schools and improvement of success rate in the classroom with particular emphasis on Grade 12; the development of planning, monitoring, and evaluation models for the entire education system; and introduction of no-fee schools since 2007.

According to the South African educational policy, schooling is compulsory between the ages of 7 and 15 years or up to the completion of Grade 9. All children are allowed to register at schools even if they do not have money for school fees (OECD, 2008). During 2009, the no-fee status of schools was extended from 40% to include 60% of learners nationally by 2010. In these schools, learners do not pay fees, but the schools receive larger state allocations per learner than other schools (Government Communications and Information System [GCIS], 2010). It has been noted that participation in the educational system has increased amongst historically disadvantaged groups, especially in primary and lower secondary school levels (Bhana et al., 2011). However, it drops sharply after Grade 9 (Bhana et al., 2011; Panday and Arends, 2008). This is of concern, as education is the primary vehicle for preparing the youth for meaningful entry to and participation in the labour market. A better understanding of socioeconomic factors that influence educational attainment can assist policy makers to develop the necessary strategies to ensure that youth are retained in the educational sector for longer periods of time with, overall, better educational outcomes. This chapter explores the factors that influence the educational outcomes of youth aged 15 to 34.

2. LITERATURE REVIEW

According to Cornwell and colleagues (2005), the household is a typical *decision-making* unit. It is the unit in which decisions are made about whether to send a child to school and also where the costs and benefits of sending a child to school are weighed. Teachman and colleagues (1996) have argued that the family is important in determining success. Households with poor resources can struggle to send a child to school, and the costs can be significant. In some households, sending a child to school is an opportunity cost, as it reduces the amount of labour available to the household. In some households, especially those in rural areas, children can be involved in household activities such as fetching water and cow dung and cleaning the house.

Keng (2004) contends that a *parent's level of education* is one of the determining factors in schooling progression. He also reasons that parents may prefer to invest in one child over the other. Differences in educational participation by income, gender, and geography, according to Keng, are other factors that can affect a household's decision on the child's schooling progression. Cornwell and colleagues (2005) argue, for example, that the costs of education can be very high for poor households in rural areas.

Pal (2004) found that parents' low levels of education and household income result in poor schooling attendance and educational attainment. Kravdal (2004) argued that the educational levels of women are determined by their parents' education. According to Kravdal, higher levels of education amongst women strengthen their position at work and improve the standard of living of the community in which they live. In addition, their education and knowledge may be passed to their family members, including their children.

It has been found by Case and Ardington (2006) that children who have *lost their parents* are at risk of not progressing with education. They also found that there are significant differences between the death of a mother and that of a father and how each affects a child's schooling outcomes. Cooksey and Rindfuss (2001) claim that by the time young men and women reach their twenties, they have already experienced a diverse life history, depending on their family background, with regard to household formation, education, work, and marriage. They reason that all these factors affect the upbringing of children and the way they progress at school. Sanhueza and Zapata (2006) contend that women's educational choices have been affected by the family's sibling sex composition. They state that, on average, women undergo 0.5 more years of schooling if they have only sisters.

In their study, Eloundou-Enyegue and Williams (2006) examined *family size* and schooling in sub-Saharan Africa. They reasoned that only a few studies have explored the association between family size and schooling. The hypothesis that Eloundou-Enyegue and Williams (2006) wanted to test was that the "association between family size and schooling is stronger if analysis using time-varying, rather than time invariant measures of family size are used." They also tested the hypothesis that family size and schooling

is distorted by failure to adjust for the clustering of observations, differential selection, or unobserved characteristics of the families. The last hypothesis they tested was that family size and schooling depend on the spatial, historical, educational, and economic contexts. These authors argued that the association should be greater as time goes on and in urban areas, beyond primary school, and when economic times are tough. They found a positive relationship between family size and schooling in sub-Saharan Africa, although other studies have suggested that there is a negative relationship between family size and schooling (e.g. Anh et al., 1998; Bhat, 2002; Booth and Kee, 2009). Eloundou-Enyegue and Williams (2006) further argued that those researchers that found a negative relationship have acknowledged experiencing difficulty in the methodology, and this may have affected their conclusion. They concluded that the association between household size and schooling increased over time and that the spatial and historical context is important. They found that extended family networks have enabled children to be educated.

Cornwell and colleagues (2005) in their study, testing a number of hypotheses, concluded that the presence of a child in a household who is schooling helps encourage other siblings to attend school and that the presence of a working-age migrant improves the educational participation of children. In this study, they realised that it is the female migrant that had an effect on the schooling attendance of girls. They also contended that the receipt of an old-age grant by a grandparent helped to increase the probability of girls attending school but that the same likelihood was not present among boys.

Teachman and colleagues (1996), although supporting the findings of Cornwell and colleagues (2005) that financial and human capital are important determinants of educational success of children, also claimed that social capital as measured by interaction among parents, children, and schools is also an important factor. They postulated that, within a family, social capital is represented by a positive relationship between a child and a parent and that without a positive relationship between these two, even the presence of financial resources will not help a child succeed in school.

Mare (1980) proposed that economic benefits (like income) are more beneficial at lower grades and have little or no influence once the child is at university or college. He argued that some children are even discouraged from proceeding with their education as a result of their parents being wealthy.

In order to determine that a parent-to-child relationship exists, Teachman and colleagues (1996) found that living with a divorced father is associated with less social capital. These fathers were found to be less concerned with their children's schooling. Living with a never-married woman was not associated with indicators of social capital. They found that living with a stepparent or a divorced mother was also associated with less social capital. Disruptions in marital status also lead to instability in the residential environment, and the measurements of the parent–child and parent–school

relationship were both negatively related to dropping out of school. There was a positive relationship between dropping out of school and how many times a child changed schools.

3. DATA SOURCES AND METHODOLOGY

The data sources used in this study are from the 1996 and 2001 censuses and the Community Survey of 2007. The first census after the democratic transition in South Africa was carried out in October 1996, and the second census was conducted in October 2001. In 2007, the Community Survey (CS) was undertaken after the Cabinet took a decision to postpone the census from 2006 to 2011. This large sample household survey was designed to provide demographic and socioeconomic data up to municipal level and consisted of a sample of 238,067 dwelling units across all provinces.

Both the 1996 and 2001 censuses and CS 2007 used face-to-face interviews to complete the questionnaires. Three questions on education were included during Census 1996. The respondents were asked about the highest school grade completed. In 2001, the question on whether the institution was public or private was added to the questions on education. In 2007, a question on school attendance was asked separately from the educational institution, and a question on the field of education was removed. Only comparable questions or variables were used from these data sources.

This study is undertaken focusing on the youth aged 15 to 34, with special focus on those that reported that they were not attending any educational institution during the time that the censuses and Community Survey were conducted. Although the National Youth Policy defines South African youth as young people between the ages of 14 and 35 years (The Presidency, 2009), the study used a definition that is also used in the Labour Force Survey; youths are defined as young people between the ages of 15 and 34 years (Statistics South Africa, 2010).

The data was analysed using STATA version 10. Descriptive bivariate statistical analysis such as frequencies and percentages was utilised. Standard logistic regression was used to investigate the relationship between the dichotomous categorical outcome (educational attainment) and explanatory variables selected based on the literature review. Logistic regression is widely applied to model the outcomes of a categorical dependent variable, with independent variables either continuous or categorical or both.

The general form of the model is:

$$Y = a + b_1x + b_2x + \ldots + b_m x_m \quad (1)$$

$$Y = \log_e (p/(1-P)) = logit\ (P) \quad (2)$$

$$P(Z = 1) = \frac{e^y}{1 + e^y} \quad (3)$$

With x_1, $x_2 \ldots$, x_m are explanatory variables, and the function y is a linear combination of these explanatory variables representing a linear relationship. The parameters b_1, $b_2 \ldots b_m$ are the regression coefficients to be estimated, while Z is the binary response variable to be estimated. The function y is presented as logit (P), the log (to base *e*) of the odds or likelihoods ratio that dependent variable z has a value of 1. The probability P will increase as the value y increases. The probability value P is represented by the regression coefficients b_1–b_m. A positive sign of the coefficients indicates that the explanatory variable helps to increase the probability or odds of the dependent variable having a particular outcome, whilst a negative sign indicates the reverse effect. Odds ratios were used to report the results of the logistic regression.

4. RESULTS

Table 10.1 shows that among men, there has been an improvement in the proportion of individuals with no schooling, with a decrease from 11.7% in 1996 to 10.0% in 2001 and to 3.0% in 2007. It also shows a notable increase in the percentage of men with some secondary education, from 34.7% in 1996 to 47.7% in 2007. Educational attainment among men with Grade 12/Std10 peaked at 28.1% in 2001 from 22.0% in 1996 and subsequently decreased to 24.6% in 2007.

A similar trend was observed amongst women. The proportion of women aged 15 to 34 years with no schooling decreased from 11.8% in 1996 to 10.9% in 2001 and to only 2.8% in 2007. The proportion of women with some secondary education increased from 37.2% in 1996 to 50.6% in 2007, and those with Grade 12/Std10 increased from 20.8% in 1996 to 27.6% in 2001 and decreased to 25.0% in 2007.

Table 10.2 shows that among Black Africans, a higher percentage of individuals had no schooling in 1996 (14.6%) compared to Coloureds (4.7%), Indians/Asians (1.7%), and Whites (1.0%). Although the percentage of Black Africans with no schooling decreased from 14.6% in 1996 to 3.3% in 2007, it was still higher compared to other population groups. Among the Coloured population group, the percentage of individuals with no schooling decreased from 4.7% in 1996 to 1.6% in 2007, while it was stable among the Indian/Asian and White populations.

Limpopo had the highest percentage (22.2%) of individuals with no schooling in 1996, followed by Mpumalanga (17.6%), North West (15.5%), KwaZulu-Natal (15.5%), Northern Cape (14.7%), and Eastern Cape (11.9%). Western Cape (3.4%), Gauteng (6.1%), and Free State (8.3%) had the lowest percentages of individuals with no schooling in 1996. Generally, the same pattern prevailed in all provinces; the percentage of individuals with no schooling decreased from 1996 to 2007, except

Table 10.1 Percentage distribution of the educational attainment of 15- to 34-year-olds, not attending educational institutions, by sex, 1996–2007

	1996	2001	2007
Men		**Percent**	
No schooling	11.7	10.0	3.0
Some primary	17.7	14.1	12.1
Primary	8.3	6.5	5.9
Some secondary	34.7	34.3	47.7
Grade 12/Std 10	22.0	28.1	24.6
Tertiary	5.5	7.1	6.8
Total	**100.0**	**100.0**	**100.0**
Women			
No schooling	11.8	10.9	2.8
Some primary	16.1	11.1	8.7
Primary	8.9	6.4	5.2
Some secondary	37.2	36.0	50.6
Grade 12/Std 10	20.8	27.6	25.0
Tertiary	5.2	8.0	7.7
Total	**100.0**	**100.0**	**100.0**
Both sexes			
No schooling	11.8	10.4	2.9
Some primary	16.8	12.5	10.4
Primary	8.6	6.4	5.6
Some secondary	36.1	35.2	49.1
Grade 12/Std 10	21.4	27.8	24.8
Tertiary	5.3	7.6	7.3
Total	**100.0**	**100.0**	**100.0**

Source: Census 1996, Census 2001, and Community Survey 2007
Note: Community Survey figures may not directly compare to Census figures due to the fact that it is a survey.

for Eastern Cape. There, the percentage with no schooling increased from 11.9% in 1996 to 14.5% in 2001 and later dropped significantly to only 3.3% in 2007.

In 1996, among the youth living in a household where the head had tertiary education, a large proportion (38.4%) of the household members

Table 10.2 Percentage distribution of the educational attainment of 15- to 34-year-olds, not attending educational institutions, by population group, 1996–2007

	1996	2001	2007
Black African		**Percent**	
No schooling	14.6	12.5	3.3
Some primary	19.6	14.1	11.7
Primary	9.7	6.9	5.9
Some secondary	36.2	35.9	51.1
Grade 12/Std 10	17.2	25.1	22.7
Tertiary	2.7	5.5	5.3
Total	**100.0**	**100.0**	**100.0**
Coloured			
No schooling	4.7	3.6	1.6
Some primary	16.3	12.5	9.3
Primary	10.6	8.6	7.1
Some secondary	45.5	43.2	51.9
Grade 12/Std 10	18.7	27.6	25.2
Tertiary	4.2	4.6	4.9
Total	**100.0**	**100.0**	**100.0**
Indian/Asian			
No schooling	1.7	1.7	1.6
Some primary	1.8	1.5	1.8
Primary	2.1	1.6	1.5
Some secondary	35.8	26.0	32.9
Grade 12/Std 10	47.8	52.3	44.2
Tertiary	10.9	16.9	17.9
Total	**100.0**	**100.0**	**100.0**
White			
No schooling	1.0	1.1	0.6
Some primary	0.4	0.7	0.7
Primary	0.3	0.6	0.8
Some secondary	23.7	20.3	29.8
Grade 12/Std 10	48.7	47.4	40.0
Tertiary	25.9	29.9	28.1
Total	**100.0**	**100.0**	**100.0**

Source: Census 1996, Census 2001, and Community Survey 2007
Note: Community Survey figures may not directly compare to Census figures due to the fact that it is a survey.

Table 10.3 Percentage distribution of the educational attainment of 15- to 34-year-olds, not attending educational institutions, by province, 1996–2007

	1996	2001	2007		1996	2001	2007
Western Cape		**Percent**		**KwaZulu-Natal**		**Percent**	
No schooling	3.4	3.2	1.1	No schooling	15.5	14.0	3.5
Some primary	15.1	11.7	8.9	Some primary	18.0	13.1	11.0
Primary	9.7	7.7	6.1	Primary	7.9	5.9	5.3
Some secondary	42.2	40.5	52.6	Some secondary	33.0	32.8	47.0
Grade 12/Std 10	21.2	28.4	23.3	Grade 12/Std 10	21.6	27.7	27.0
Tertiary	8.3	8.5	8.1	Tertiary	3.9	6.4	6.2
Total	**100.0**	**100.0**	**100.0**	**Total**	**100.0**	**100.0**	**100.0**
Eastern Cape				**North West**			
No schooling	11.9	14.5	3.3	No schooling	15.5	11.8	4.8
Some primary	24.1	17.5	17.3	Some primary	20.7	16.6	13.6
Primary	10.5	7.6	7.3	Primary	8.9	6.5	5.9
Some secondary	34.3	34.0	50.7	Some secondary	32.2	32.0	45.5
Grade 12/Std 10	14.7	20.3	16.2	Grade 12/Std 10	18.8	27.3	24.6
Tertiary	4.4	6.1	5.3	Tertiary	3.9	5.8	5.7
Total	**100.0**	**100.0**	**100.0**	**Total**	**100.0**	**100.0**	**100.0**
Northern Cape				**Gauteng**			
No schooling	14.7	10.6	4.2	No schooling	6.1	5.2	1.7
Some primary	21.8	18.2	13.9	Some primary	9.8	7.4	5.7
Primary	10.0	9.2	7.6	Primary	6.8	4.7	3.9
Some secondary	33.0	35.3	45.3	Some secondary	42.3	36.5	48.3
Grade 12/Std 10	15.3	21.8	24.1	Grade 12/Std 10	28.1	35.3	29.6
Tertiary	5.2	4.9	4.9	Tertiary	7.0	10.9	10.8
Total	**100.0**	**100.0**	**100.0**	**Total**	**100.0**	**100.0**	**100.0**
Free State				**Mpumalanga**			
No schooling	8.3	8.2	2.0	No schooling	17.6	14.4	3.8
Some primary	21.3	15.5	10.5	Some primary	17.2	13.8	9.9
Primary	11.1	8.2	6.4	Primary	8.8	6.9	5.3
Some secondary	36.3	37.4	51.5	Some secondary	30.9	31.9	49.0
Grade 12/Std 10	18.4	24.9	23.4	Grade 12/Std 10	21.1	27.3	26.2
Tertiary	4.7	5.8	6.2	Tertiary	4.5	5.5	5.9
Total	**100.0**	**100.0**	**100.0**	**Total**	**100.0**	**100.0**	**100.0**

(*Continued*)

Table 10.3 (Continued)

	1996	2001	2007		1996	2001	2007
Limpopo		**Percent**				**Percent**	
No schooling	22.2	17.2	4.3				
Some primary	14.4	12.0	11.2				
Primary	8.2	6.8	6.6				
Some secondary	30.3	35.5	52.4				
Grade 12/Std 10	20.4	21.3	19.9				
Tertiary	4.4	7.1	5.5				
Total	**100.0**	**100.0**	**100.0**				

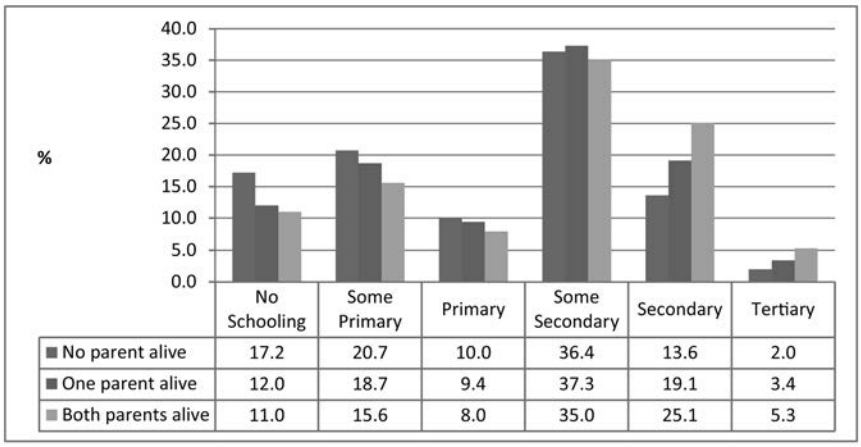
Source: Census 1996, Census 2001, and Community Survey 2007
Note: Community Survey figures may not directly compare to Census figures due to the fact that it is a survey.

achieved tertiary education, followed by those who completed matric. The same pattern is depicted in both Census 2001 and the Community Survey of 2007, with a general increase in youth with a tertiary education if they were living in a household with a household head with a tertiary education, from 38.4% in 1996 to 46.1% in 2007.

As the household size increases, the chances that household members will achieve a tertiary education decrease. This pattern persisted between 1996 and 2007, underscoring the fact that youth may not attain any education because of their family's size.

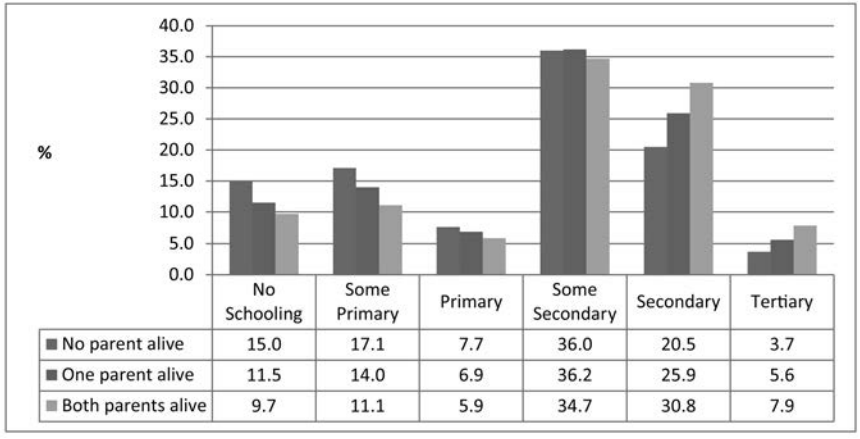
Figures 10.1 to 10.3 show that youth with no parents lag behind those who have one or both parents alive for the achievement of secondary as well as tertiary education. Youth living in households with only one or no parents alive were significantly more likely to attain secondary or lower educational levels than those with both parents alive. The overall patterns remained similar over the period 1996 to 2007, even though a lot more of the youth had shifted into the secondary cohort by 2007.

The above pattern is reinforced in multivariate analysis, which shows that the odds ratio for a household size of six and above relative to a household size of three and fewer is 1.37 units higher for an educational attainment of some secondary education relative to an educational attainment of *no schooling*, given that all other predictor variables in the model are held constant. This means there are more chances of achieving some secondary schooling than achieving no schooling as the household size increases. Both Census 2001 and the Community Survey of 2007 confirmed the findings.



	No Schooling	Some Primary	Primary	Some Secondary	Secondary	Tertiary
No parent alive	17.2	20.7	10.0	36.4	13.6	2.0
One parent alive	12.0	18.7	9.4	37.3	19.1	3.4
Both parents alive	11.0	15.6	8.0	35.0	25.1	5.3

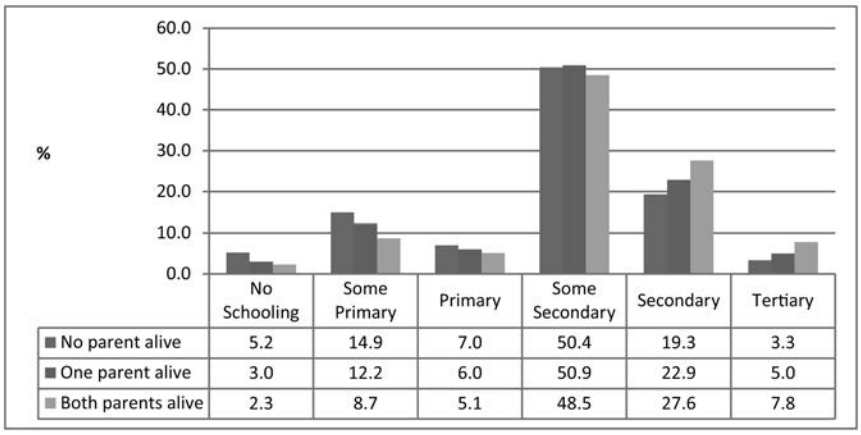
Figure 10.1 Percentage distribution of educational attainment of 15- to 34-year-olds, not attending educational institutions, by parental survival, 1996



	No Schooling	Some Primary	Primary	Some Secondary	Secondary	Tertiary
No parent alive	15.0	17.1	7.7	36.0	20.5	3.7
One parent alive	11.5	14.0	6.9	36.2	25.9	5.6
Both parents alive	9.7	11.1	5.9	34.7	30.8	7.9

Figure 10.2 Percentage distribution of educational attainment of 15- to 34-year-olds, not attending educational institutions, by parental survival, 2001

There is also a greater likelihood that youth in households where both parents are alive will attain some secondary education. For Census 1996, the odds ratio for both parents being alive, relative to no parents alive, is 2.04 times higher for an educational level of some secondary schooling relative to no schooling. The results were also confirmed by Census 2001 and the Community Survey of 2007. It is shown that youth are more likely to attain some secondary education in households where the head has a tertiary qualification. This pattern cuts across all the data sources. Female



	No Schooling	Some Primary	Primary	Some Secondary	Secondary	Tertiary
No parent alive	5.2	14.9	7.0	50.4	19.3	3.3
One parent alive	3.0	12.2	6.0	50.9	22.9	5.0
Both parents alive	2.3	8.7	5.1	48.5	27.6	7.8

Figure 10.3 Percentage distribution of educational attainment of 15- to 34-year-olds, not attending educational institutions, by parental survival, 2007

youth are also more likely to achieve some secondary education than male youth. Whites are 2.17 times more likely to attain higher education than other population groups, but this likelihood decreases in later years. The data also suggests that the odds of a White youth getting some secondary relative to no education when compared to a Black African youth decreased significantly between 1996 and 2007.

It is shown that youth living in the Eastern Cape and Northern Cape are less likely to achieve matric than those residing in the Western Cape. The findings were statistically significant at 99.9%. Census 2001 showed that being in North West, Gauteng, or Mpumalanga improves the chances of achieving matric rather than no schooling.

The results also show that women were less likely than men to achieve matric as opposed to no schooling in the Census of 1996, and findings were statistically significant at 99.9%. Neither Census 2001 nor Community Survey 2007 results were significant at 99.9% level of significance. All other racial groups were more likely than Black Africans to achieve matric as opposed to achieving no schooling. This was confirmed by all datasets used in the study.

Generally, the results indicate that bigger households have a slightly smaller or equal chance of a youth not attending school having tertiary education than households with three or fewer members. However, it is important to note that with the exception of Census 2001 and for household size of four, none of these odds ratios were statistically significant, at a 99.9% level of significance.

The presence of one or both parents as opposed to no parent alive is an indicator for achieving a tertiary education as opposed to achieving no schooling. According to Census 1996, the multinomial odds ratio for both

parents being alive in relation to no parents alive is 4.76 times higher for achieving a tertiary education in 1996 and 5.58% higher in 2007 as compared to achieving no schooling. There is also a greater likelihood of achieving a tertiary education rather than no schooling when the household head has either some primary, primary, some secondary, matric, or tertiary education as opposed to no schooling.

5. DISCUSSION AND CONCLUSION

This study focused on identifying changes in educational attainment as well as factors influencing the educational attainment of youth aged between 15 and 34 years who were not attending an educational institution at the time of data collection. This particular target group was selected not only because the youth are our future leaders and form a significant proportion of the total population of South Africa but also because understanding the factors influencing attainment amongst those who no longer study may assist with the development of strategies that could enhance the possibility of the youth remaining within the education cycle longer, as well as increasing their educational attainment before they discontinue their studies. The analysis was based on data collected in Census 1996, Census 2001, and the Community Survey of 2007. Multinomial logistic regression was used as an analysis tool, more particularly to determine the odds ratios of the various factors considered.

Since 1996, significant progress has been made in reducing the percentage of South African youth with no schooling. This percentage has been reduced for males from 11.7% in 1996 to 3.0% in 2007 and for women from 11.8% in 1996 to 2.8% in 2007. The odds ratios suggest that females were more likely than males to have achieved a tertiary education, and the odds of achieving this increased consistently between 1996 and 2007. In terms of having at least some secondary education or Grade 12, no consistent patterns emerged over time, with similar odds ratios for females and males in some instances and odds ratios in favour of either males or females in others.

The results pertaining to the population group of youth that are not attending educational institutions suggest that in the general population, Indians/Asians and Whites have a greater chance of achieving Grade 12 and a tertiary education than Black Africans. However, the gap between the Black African and other population groups has been narrowing since 1996, and this is more than likely the result of changes in government policy during this period. Social transfers such as the introduction and expansion of the child-support grant, the introduction of school feeding schemes, and no-fee schools, as well as increased access through expansion of the school network and so on, undoubtedly contributed towards making it easier for poor households to educate their children.

However, a lot more needs to be done before the educational attainment of Black Africans will be comparable to that of the Indian/Asian and White population groups. Historically, the Western Cape and Gauteng have tended to have higher levels of educational attainment than the other provinces in South Africa. In terms of geographic changes in educational attainment for those with at least some schooling, the most significant changes between 1996 and 2007 took place in Limpopo, Mpumalanga, KwaZulu-Natal, and North West. In 2007, the Eastern Cape, Northern Cape, and Free State had the lowest proportion of youth not attending school with a qualification of at least Grade 12 or higher. In 2007, youth not attending educational institutions with a tertiary qualification were significantly more likely to come from the Western Cape than from any other province. Those with some secondary schooling (i.e. who could potentially be targeted for support programmes to complete at least their secondary education) were also more likely to come from the Western Cape than any other province.

In addition to gender, race, and geographic location, a number of other factors that influence educational attainment were considered. These included the level of education of the household head, household size, and parental survival.

The study suggests that youth with no education are more likely to come from households with six or more persons than from smaller households. When considering only percentages, it appears as if individuals that have completed tertiary education are more likely to be from households consisting of three persons or fewer than any other household size investigated. This is not consistent with the findings of Eloundou-Enyegue and Williams (2006), who suggested that there is a positive relationship between increased household size and educational attainment. One of the possible reasons for these differences is that the census and Community Survey did not take extended family networks into consideration, which was emphasised by Eloundou-Enyegue and Williams. Interventions that reduce cost and burden on especially poor families (such as feeding schemes at all schools, no-fee schools, and child-support grants) can make a significant difference in getting the youth to complete more years of schooling. However, the odds ratio analysis suggests that youth not attending school with some secondary schooling or Grade 12 are statistically significantly more likely to come from larger households than from smaller households. For tertiary education, no statistically significant trends emerged.

The study has also shown that there is a positive relationship between the education level of the head of the household and the level of education of household members, which confirms the findings reported by authors such as Pal (2004) and Kravdal (2004). In general, as the education level of the household head increases, the chances that youth not attending educational institutions will also achieve higher levels of education also increase.

The findings have revealed the importance of social factors such as orphanhood, education of the household head, location, and population

group in educational attainment. The impact of government interventions is notable, as educational attainment has increased between 1996 and 2007, and even more significantly amongst the youth living in a household with a household head who has no schooling. This could be attributed to changes in government policy which made education compulsory for children aged 7 to 15 years and with the introduction of no-fee schools and feeding schemes at schools. Although progress has been made in educational attainment since 1996 for both Black Africans and Coloureds, it is still lower than that of Whites, especially at matric and tertiary levels. Greater interventions are still needed among Black Africans for the government to intervene once children pass matric in order for them to progress to tertiary education.

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11 Demography of Labour Force in a Transitional Society

Clifford O. Odimegwu, Sasha Frade, Nicole De Wet, and Sunday Adedini

1. INTRODUCTION

The concept of labour force is often not given adequate coverage among demographers in South Africa. This domain of population dynamics has been left to industrial sociologists and labour economists. This chapter addresses this shortcoming by examining the demographic aspects of the concept of labour force in South Africa.

According to international standards, the labour force measure comprises "all persons of either sex who furnish the supply of labour available for the production of economic goods and services," including employees, self-employed persons, and those who assist without pay in a family business (UN, 1967). The concept also includes unemployed persons as well as those employed during the period to which the data refer. Employed persons in this case comprises both full-time and part-time workers, while the unemployed are defined as persons who are not at work and are seeking work for pay or profit during the reference period (Standing, 1981, 1983; Statistics SA, 1998). On the other hand, the economically inactive population comprises persons engaged only in activities which do not contribute directly to the production of economic goods and services. This group includes housewives and students as well as disabled, the retired, and other inactive persons. Jaffe (1959) noted that the significance of the labour force is that all members of a population consume goods and services, but only members employed in the labour market produce the goods and services.

Because of its relationship to production and consumption, a country's labour force and its size, composition, and changes are of significant interest to demographers and economists. In a country where the economy is not broad based and which has just begun to open up to the general population, understanding the relationship between the labour force and the level of economic development is important. South Africa is a country in transition, having been dominated by a minority for a long time during the colonial and apartheid eras. Access to employment opportunities had been limited

to a few until the recent time. On attainment of democratic dispensation in 1994, the economy began to expand to allow the previously disadvantaged groups free participation in the economy. The economy is transforming and thus has accelerated structural changes in the labour force. There is a huge demand for skilled labour. Changes in the labour market always interact with the structure of occupations and industry. The ongoing transformation of the South African economy has great influence on the country's industrial structure, and as such, an individual's occupation is a function of the changing structure of industry.

This chapter examines the levels, trends, patterns, and determinants of labour force participation since the advent of democracy in South Africa. Micro- and macro-level approaches to the study of labour force are highlighted, and theoretical approaches, methodological issues, and measurements are discussed. As such, definitions and measurements of the labour force are analysed, and the demographic characteristics of South African labour force and the structure of occupations and industry are discussed.

1.1. Technical Issues, Concerns, and Approaches

The United Nations published its first edition of guidelines on technical issues related to the conduct of population and housing censuses in 1980 (UN, 1980). This earlier version of the guidelines did not contain information on technical issues related to economic activity. However, a revised version of the handbook which did contain information on economic activity was later issued to guide the various member states on the conduct of the 1990 round of censuses (UN, 1990). This round of censuses coincided with the period when South Africans were counted for the first time as citizens of a democracy in 1996. The UN handbook for the 1990 round of censuses presents the content of census questionnaires and guidelines on other important technical issues to ensure uniformity in census methodology in various member states of the United Nations. Another handbook which is intended to specifically provide census planners with a variety of approaches to measuring labour force participation rates was released in 2005.

2. DATA AND METHODS

Statistics South Africa (Stat SA) has described methodological defects of its labour force surveys in its various documentations (Statistics SA, 2008).

2.1. History of the Labour Force Survey

The principal vehicle for collecting labour market information for the whole country over the period 1994 to 1999 was the annual October Household

Survey (OHS). The OHS was an independent cross-sectional survey that had different sample designs. Over the years, the labour market component of the OHS questionnaire was also changed to accommodate both national requirements in terms of providing information to inform policy and international requirements that conformed to the standards of the International Labour Organisation (ILO).

The first Labour Force Survey (LFS) was conducted in 2000. It was undertaken on a six-monthly basis in March and September each year up to 2008, when the Quarterly Labour Force Survey was launched. The LFS was more focused on labour issues than its predecessor (the OHS), since the bulk of the nonlabour questions were channelled to the General Household Survey (GHS). As with the OHS, the LFS sample was representative of all provinces, as well as district councils within provinces. Its sampling methodology was consistent in each round of the survey. The intention was that the selected dwelling units would remain in the sample for five consecutive surveys, with one fifth of these dwelling units rotating out at each round of the survey. The dwelling unit approach was adopted because households are constantly on the move and cannot easily be tracked.

Following criticisms related to scope, coverage, timeliness, and frequency of the survey, the labour force survey was redesigned. Statistics South Africa decided to embark on a quarterly cycle for the collection of labour market information. A new master sample and listing procedures were developed, new fieldwork procedures implemented, a shorter core questionnaire was formulated, and an end-to-end data processing system has been developed.

2.1.1. Determining Labour Market Status

The statistics of the economically active population, as well as employment, unemployment, and underemployment, provide measures of labour supply, labour input, the structure of employment, and the extent to which the available labour time and human resources are actually utilised. Such information is essential for macroeconomic and human resources development planning and policy formulation. When collected at different points in time, the data provide the basis for monitoring current trends and changes in the labour market and the employment situation. This may be analysed in connection with other economic and social phenomena to evaluate macroeconomic policies (Statistics SA, 2008).

2.2. The Labour Force Framework

The labour force framework is the basis for the joint measurement of employment according to the international guidelines. The requirements of the framework ensure that the three categories—employed, unemployed, and economically inactive—are exhaustive and mutually exclusive. It shows that the working-age population is divided into two broad labour market

groups—persons that are *employed* and those that are *not employed*. Persons that are not employed are further divided into those who are *unemployed* and those who are *economically inactive* (Statistics SA, 2008).

2.3. Data Source

Having presented the methodological defects of Stats SA's labour force surveys, this section presents the data source for this chapter. The sources of data for this chapter include South African 1996 and 2001 censuses data as well as the country's Community Survey conducted in 2007. Additionally, due to the fact that South Africa's population is not stable due to the effect of the HIV/AIDS pandemic, we utilized the INDEPTH model life tables for the construction of the tables of economically active life for the country.

INDEPTH model life tables essentially applied the empirical data from the nineteen demographic surveillance sites across the African continent and identified two prevailing model families for the computation of life table survivorship functions for the sub-Saharan African countries (INDEPTH, 2004). A pattern-of-life table useful for the computation of life tables of countries with high HIV/AIDS prevalence is adopted. This reflects the situation in Eastern and Southern Africa (with HIV prevalence typically above 10%). Hence, in our construction of the length of working life for South Africa, we utilized pattern 2 of the survivorship probability functions of INDEPTH model life tables (INDEPTH, 2004).

3. RESULTS

3.1. Size of the Labour Force

The size of a country's labour force is measured by crude activity rate, defined as the percentage of the total population classified in the census as economically active. As noted earlier the definition of labour force, participation in South Africa has undergone some changes. Censuses 1996 and 2001 defined labour force participation as the economic activities of the working-age population which is economically active, while the various labour force surveys define it as a share of the economically active population aged 15 to 64 years who are working or seeking work (Statistics SA, 2008).

Table 11.1 shows the size of the South African labour force for the periods under study (1996–2007). Two concepts are illustrated here. One is refined activity rate, which relates the labour force totals to the population above the specified minimum age (percentage of population aged 15 years and above), while the second is crude activity rate, which relates to the population of all ages (percentage of the total population). The refined activity rates are true measures of participation in economic activities of the population. Thus from the table, the crude activity rate does indicate

Table 11.1 Percentage distribution of labour force size, South Africa 1996–2007

	1996		2001		2007	
	Crude Activity Rate	Refined Activity Rate	Crude Activity Rate	Refined Activity Rate	Crude Activity Rate	Refined Activity Rate
Gender						
Male	46.9	54.3	46.2	51.3	47.3	51.8
Female	53.1	45.7	53.8	48.7	52.7	48.2
Total	100	100	100	100	100	100
Population Group						
Black Africans	74.0	71.4	76.9	76.5	74.6	75.6
Coloured	9.0	10.4	9.4	10.1	11.3	11.7
Asians	3.0	3.2	2.8	2.8	2.6	2.6
White	13.1	14.2	10.9	10.6	11.4	10.1
Province						
Western Cape	10.8	12.5	9.0	9.4	11.8	13.2
Eastern Cape	14.4	11.2	18.3	17.1	14.5	11.4
Northern Cape	2.0	2.1	2.5	2.5	5.1	4.8
Free State	6.9	7.4	7.3	7.7	5.9	5.9
Kwazulu-Natal	19.8	18.3	20.3	19.9	19.9	18.6
Northwest	8.5	8.7	7.9	7.9	7.0	6.7
Gauteng	20.7	26.2	14.1	15.9	19.6	25.5
Mpumalanga	6.5	6.3	7.0	7.0	6.9	6.8
Limpopo	10.5	7.4	13.6	12.6	9.3	7.2
Total	100	100	100	100	100	100

somehow a significant difference during the three periods. The size of the male labour force slightly declined from 54.3% in 1996 to 51.3% in 2001 but remained constant over the 2001 to 2007 period. Second, the female labour force size shows a different pattern from that of the male one, as the percentage of female population in labour force increased from 45.7% in 1996 to 48.7% in 2001. However, as with the male population, this remained constant from 2001 to 2007.

Also, the size of the labour force population seems to be constant during the period under study in most of the provinces, with exceptions in Gauteng (where the size of the labour force population declined drastically from 26.2% to 15.9%) and Eastern Cape (where there was an increase in the size of the labour force population from 11.2% in 1996 to 17.1% in 2001). In 2007, however, the size of the labour force increased in Gauteng and decreased in Eastern Cape to figures similar to those that had been observed in 1996. During the period to which the data refer, the size of the labour force was lowest in the Northern Cape (2.1% in 1996 and 4.8% in 2007).

3.2. Demographic Profile of the Labour Force

3.2.1. Dependency Ratios

A measure of the burden of those who produce no income upon those who do is given by the concept of the dependency ratio. This is defined as the number of persons not in the labour force officially per 100 of the labour force. There are two types of dependency ratios. The child dependency ratio is defined as the ratio of population under the age of 15 to the

Table 11.2 Dependency ratios by provinces, South Africa 1996–2007

	Child dependency ratio			Elderly dependency ratio			Total dependency ratio		
Provinces	**1996**	**2001**	**2007**	**1996**	**2001**	**2007**	**1996**	**2001**	**2007**
Eastern Cape	39.3	32.8	34.0	6.0	5.8	7.8	45.3	38.7	41.8
Free State	31.5	28.9	27.5	4.6	6.0	7.0	36.2	34.8	34.6
Gauteng	25.1	32.0	24.9	4.4	3.9	4.8	29.5	35.9	29.9
KwaZulu-Natal	36.0	34.8	32.8	4.7	4.4	5.6	10.7	39.3	38.4
Limpopo	43.1	36.4	34.3	5.3	5.4	7.1	48.5	41.8	41.5
Mpumalanga	37.4	35.0	31.5	4.4	4.5	5.6	41.7	39.5	37.1
Northern Cape	32.6	28.5	29.3	5.3	6.4	6.9	38.0	34.9	36.2
North West	33.7	33.9	28.7	4.9	4.8	6.5	38.6	38.6	35.2
Western Cape	28.7	32.7	24.9	4.4	5.5	7.0	34.1	38.2	31.9
South Africa	34.2	33.5	30.0	5.0	5.0	6.3	39.2	38.5	36.3

economically active population aged 15 to 64, and the elderly dependency ratio is defined as the ratio of the population aged 65 years and above to that of the population aged 15 to 64. The ratio is normally expressed as a percentage.

Table 11.2 shows that while the total dependency ratios declined over the period under study, the elderly dependency ratio increased during the period in South Africa. Eastern Cape and Limpopo Provinces had the highest dependency ratios, while Gauteng had the lowest in 2007. The implication of the decline in dependency ratio is that people in the active population would care for fewer people. This is because as the ratio declined, there would be a decreased burden on the active population; consumption will also be reduced, and more resources will be available for investments.

3.2.2. Age-Sex Structure of the Labour Force

In labour force demography, the specific activity rate is calculated with the formula $AR = Pe/Pt$, where Pe is the number of economically active persons in the specified category of the population and Pt is the total number of persons in the same category. This rate can be calculated for various characteristics such as sex, age, marital status, and so forth.

According to Figures 11.1 and 11.2, male and female age-specific activity rates increased consistently with age from 1996 to 2007. Male age-specific activity rates peaked at age 35 to 39 (42.2%) in 1996, at 30 to 34 (42.6%) in 2001, and also at age 30 to 34 (36.2%) in 2007. Among females, on the other hand, the rates peaked at age category 30 to 34 (36.5%) in 1996, at 25 to 29 (41.4%) in 2001, and at 35 to 39 (34.6%) in 2007. For both sexes, the pattern seems inconsistent, and this may not be unconnected with the fact that the South African economy is undergoing

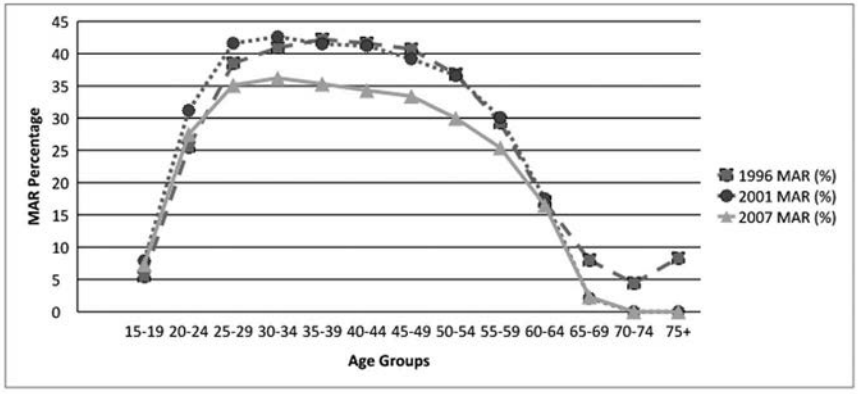

Figure 11.1 Age-Sex Structure of the Labour Force—Males (1996–2007)

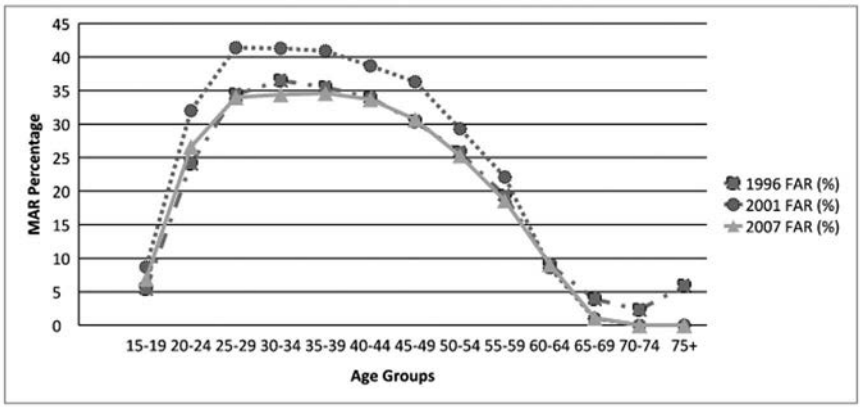

Figure 11.2 Age-Sex Structure of the Labour Force—Females (1996–2007)

transitional changes. Generally in 1996, more men were in the labour force than women, and in 2001 and 2007, the activity rates remain more or less the same.

The figures show the age-curve of South African men takes the form which is found in most countries: "males come into the labour force at various stages, mostly before 20 and some 20 and 24 years; nearly all are economically active by the age of 25 and remain so until about 55, after which age there is a progressive attrition of the male labour force by retirement or death" (UN, 1968). It is reported that the age-curves of females take different forms because women have different entry points. This study does not show this; rather, we see a pattern that is similar to that of men (Fig. 11.1). Figure 11.2 shows that the age-curve of South African females takes the same form as that of males.

3.2.3. Labour Force Participation by Age and Sex

The labour force participation rates among teenagers declined in 2007. Second, the female labour force participation rates were generally higher than those of males during the 1996 to 2001 period. A change of pattern was observed in 2007, as the labour force participation rates for males were found to be higher than those of the females for almost all the age categories.

3.2.4. Participation Rates by Level of Educational Attainment

In developing countries, the relationship between economic activity and education has some policy and programme relevance. For one, it helps to assess the quality and content of educational curricula in the country. Two, it may affect the propensity and the opportunity to engage in economic

activity in later life (Kim and Kim, 2004; Standing, 1981, 1983; UN, 1968). To examine how the level of education affects the likelihood of South Africans being in the labour force at various ages, the participation rates by educational level, sex, and age were computed.

Labour force participation rates by educational level as shown in the figures provide important information about both sexes. According to the 1996 census, those who had attained primary school recorded higher labour force participation rates than those without formal education. This decreased in subsequent years, as there were higher participation rates by those with a secondary level of education. For both sexes, there is a clear increase in the labour force participation rate of those with tertiary education. The effect of educational attainment of individuals on their labour force participation is closely related to the transitional phases of South African economic development. The first few years after 1994 welcomed and utilised the low-paid labour force with primary and secondary levels of education. As the country entered its second decade of democratisation, the economy required a labour force with more education, thus resulting in the increased labour force participation of those with higher and tertiary levels of education. Further analysis shows that participation rates increase by level of education across all ages for both males and females. For example, overall in 1996, the activity rate was highest for males with secondary education (92.5%) and for females with tertiary education (82.1%) and lowest for those with no education. The rates reached their peak at age group 35 to 44 for both males and females at all levels of education. The same patterns were recorded in 2001 and 2007.

In 1996, participation rates peaked at age group 30 to 34 (77.5%) for males with no education and slightly increased to 80.4% (also in age 30–34) in 2001, dropping again to 70.5% in 2007. A similar pattern was also observed among females, as the highest activity rate for women with no formal education increased from 53.2% in 1996 to 62.9% in 2001 and then dropped to 50.5% in 2007. This pattern may be as a result of increasing demand for educated personnel as the country transits into the second decade of democratisation.

3.2.5. Participation Rates by Marital Status and Sex

It has been recorded that the probability of women's participation in economic activities varies according to their marital status (Kim and Kim, 2004; Standing, 1981; UN, 1968). Thus, the age-specific activity rate of females may be influenced by the distribution of women's ages at marriage, as well as frequency of nonmarriage, widowhood, or divorce. Men's marital status may also have some bearing on their participation in economic activities, but this may be comparatively higher than that of females. Over the period (1996–2007), while the activity rates of the never-married males increased slightly between 1996 (23%) and 2007 (27.2%), activity rates

of the married men decreased from 77.9% in 1996 to 75.5% in 2001 and to 72.3% in 2007. There is an increasing trend in the participation rate of married women from 49% in 1996 to 53.3% in 2007. Meanwhile, an inconsistent pattern is observed in the activity rates of other categories of marital status during the period. Both cohabiting and separated/divorced people have higher activity rates than others.

3.2.6. Participation Rates by Marital Status, Gender, and Age

The results on activity rates by marital status and age for both sexes indicate that the rates peaked at age group 30 to 34 for all the categories of marital status. In 1996, among the never-married males, 83% was the highest participation rate; it was 95.2% among the married males. Also among females, according to 1996 census, never-married females had 77.3% as the highest participation rate and 63.9% among the married women. Another observation is that among females, the participation rate was lowest among the married compared to women of different marital categories. Married women play other conflicting roles such as childbearing, childrearing, and attending to other household responsibilities.

In 2001, the activity rate of the unmarried males marginally increased by 2%, but that of the married men remained constant over the period 1996 to 2001 (95.5%) but declined to 92.9% in 2007. Also, activity rates among the married men and women fluctuate sharply during the period under study. This inconsistent pattern is thus suggestive of a population that is undergoing a transitional period, both politically and economically.

3.2.7. Labour Force Participation Rate by Marital Status

Among the never-married males, labour force participation rates increased drastically from 33.8% in 1996 to 48.1% in 2001 but decreased to 37.9% in 2007. A similar pattern was also observed for the never-married females, as their participation rates increased from 48.2% in 1996 to 55.1% in 2001 and later decreased to 50.3% in 2007. Meanwhile, it is remarkable to observe that while the participation rates of the married men were found to be more than those of their never-married counterparts, in the case of the females, the participation rates of the never-married women were higher than those of their married counterparts.

3.3. Tables of Economically Active Life in South Africa

In this chapter, abridged labour force working life tables for South Africa at the different points of data—1996, 2001, and 2007—were computed. Working life tables represent the life cycle of economic activity in hypothetical generations of males and females subject at each period of their lives to given mortality rates and of participation in economic activities. The tables provide measures of the average length of economically active life and the

age-specific rates of entry into and retirement from the labour force, as well as the depletion of the labour force by death. All the columns are derived by applying the mortality rates and labour force participation rates to a hypothetical population cohort in South Africa. Details of computation can be found elsewhere (INDEPTH, 2004; Iro, 1972; Kono, 1968; Kpedekpo, 1969, 1974; UN, 1968; Willekens, 1979).

The reality of the HIV/AIDS pandemic in South Africa underscores the need for computation of tables of economically active life in the country. To account for the impact of the AIDS epidemic on the years of economically active life, survivorship functions of the INDEPTH life tables were used for the computation of life table estimates for South Africa; and empirical data on the rates of infant ($_1q_0$) and under-5 ($_5q_0$) mortality of the country was used (INDEPTH Network, 2004)

Using the infant mortality rate ($_1q_0$) of 45 per 1,000 live births and under-5 mortality rate ($_5q_0$) of 59 per 1,000 live births for South Africa for the period 1998 to 2003[1] and INDEPTH model life table pattern 2 survivorship function (l_x), separate life tables for males and females were computed and as presented in Table 11.3.

3.3.1. Years of Economically Active Life for South Africa, 1996 to 2007

The construction of the tables of economically active life is essentially based on the working population (Kpedekpo, 1969). To compute the South African years of economically active life, the 1996 and 2001 census and CS 2007 data were used to derive the age-specific activity rate (i.e. the proportion of working population to the total population in various five-year age categories). The computed activity rates for each age group in five-year intervals were used to extrapolate the hypothetical percentage of the working population working at the beginning of the age interval. This extrapolation is necessary because not all entrants to the labour force enter at the same age.

The abridged table of economically active life, according to the 1996 census, shown in Table 11.3, indicates that the percentage of lifetime inactive among South African men rises gradually from age group 15 to 19 and later began to rise steeply around age 50 to 54 and peaked at age 65+. This pattern is expected. The percentage of inactive life is expected to rise with increase in age. The data indicate that South African men in their best working-age group would spend slightly more than a tenth of their lifetime economically inactive. Also, considering the economically active life for females, Table 11.3 shows that about 20% to 60% of a South African woman's lifetime is expended, from a labour force point of view, in noneconomic activities. This may include the time spent doing household duties which are mainly undertaken by a lot of women in most parts of sub-Saharan Africa. Likewise, higher proportion of lifetime spent by women outside the labour force may be as a result of HIV/AIDS pandemic that affects women more than their male counterparts.

Table 11.3 Abridged table of economically active life for both sexes, South Africa

Age interval	INDEPTH* Estimates of the average number of years lived after age x (E_x)	Male			Female		
		Expectation of working life at age X (E_x)	Inactive years	% life-time inactive	Expectation of working life at age X (E_x)	Inactive years	% life-time inactive
15–19	41.1	35.6	5.0	12.2	33.2	7.8	19.1
20–24	36.9	31.4	5.1	13.9	28.9	8.0	21.7
25–29	33.5	27.8	5.3	16.1	25.2	8.4	25.0
30–34	31.4	24.4	5.7	18.9	22.3	9.2	29.2
35–39	29.7	21.2	6.1	22.4	19.5	10.2	34.3
40–44	27.6	18.0	6.7	27.2	16.3	11.3	40.9
45–49	24.9	14.9	7.3	32.9	13.2	11.7	47.0
50–54	22.1	12.0	7.4	38.3	10.6	11.5	52.0
55–59	19.0	9.0	7.2	44.5	8.2	10.7	56.7
60–64	15.8	6.7	6.7	49.9	6.4	9.3	59.1
65+	12.7	4.4	6.3	58.8	4.6	8.1	63.9

*Estimates represent the period 1998–2003

A good use of the length-of-working-life table is the computation of the losses from the economically active years as a result of death, disability, sickness, retirement, unemployment, or other reasons. For a country like South Africa where HIV/AIDS prevalence is high, it is reasonable to expect that a substantial part of work life would be lost to death or permanent disability. The 2001 census data were utilised to estimate the changes (increase or decrease) in years of working life in South Africa. Within the five-year period, South African men in their best working-age group would spend about one seventh of their lifetime outside the labour force. This shows some loss in the years of economically active life among the men. Also among women, instead of having some increase in years of economic active life due to expansion in the country's economy, the observed trend indicates some loss in the length of working life during the period under study. Generally, losses in years of economically active life in South Africa could largely be attributable to the effect of the HIV/AIDS pandemic.

3.4. Occupation and Industry

It is important to examine the types of economic activities prevalent in an economy. Types of economic activity are described by three classifications of workers by industry (activity of the establishment in which the individual works), occupation (kind of work done by the individual), and status (whether employer- or self-employed). Data on these aspects are useful for a number of purposes. One, the number of workers for various groups, together with information on the value of products and the use of other factors of production, provide materials for the study of productivity variations and determinants of demand for labour in different sectors. Two, the shares of industry sectors in the labour force serve as an indicator of the level of economic development which may be used in conjunction with other indicators to compare a country's position in this respect with the position of other countries to measure progress in economic development in the course of time. Finally, the occupation and status distributions of the labour force are also indicators of the level of development—used to study social mobility, fertility, and mortality differential patterns of consumers' expenditures and other sociological, demographic, and economic questions (ILO, 2001; Standing, 1981, 1983; UN, 1968).

3.5. Occupational Profile of Workers

The main feature of the South African occupational structure in the three data points is a mixed bag of inconsistencies, witnessing increases in some and decreases in others. The increase in the proportion of workers in professional occupation is noticeable. The share of the professional occupations was 11% in 1996, decreased to 7.2 % in 2001, and increased to 13% in 2007. There is also a noticeable increase in the number of legislators, senior

officials, and managers—from 4.5% in 1996 to 10.6% in 2007. Technicians increased in 2001 but recorded a decrease in 2007.

Service workers and plant and machine operators were almost steady. Crafts and related trade workers showed some declines. Generally, while some occupations declined in 2001 and rose in 2007, others increased in 2001 and later decreased in 2007. This may be a result of data quality.

3.6. Occupational Composition of Workers by Gender

While the share of female legislators increased from 27.6% in 1996 to 38.3% in 2007, there was a decrease of 10% in the share of male legislators during the period under study. This is suggestive of an increase in the proportion of women in politics as the country enters her second decade of democracy. There is also a noticeable increase in the proportion of women engaged in agriculture/fishery—from 20.5% in 1996 to 33% in 2007—but the proportion of men in agriculture/fishery recorded a decrease from 79.5% in 1996 to 67% in 2007.

An increase in proportion of female legislators and senior managers from 28% in 1996 to 30% (2001) and 38.3% (2007) is noted. The proportion of male professionals increased from 45.1% in 1996 to 57% in 2001 but decreased in 2007, while female professionals increased. This is a reflection of increased educational attainment of women in the country. Inconsistencies noticed in the variations in occupational distributions over the three periods may be a reflection of the ups and downs of the global economy. The distribution of South Africa's industry by labour force reveals that the community, social, and personal-services sector was the largest employer of labour in 1996, with 12% of the country's workforce engaged in that sector. Again in 2001, this sector maintained the lead, as the percentage of the workforce in the sector rose to 29% but showed a decrease according to the Community Survey of 2007. This last scenario may be a result of data quality. In addition, throughout the period under study, the electricity, gas, and water-supply sector accommodated the lowest proportion of the country's workforce, as the percentage engaged in the sector was less than 1% from 1996 to 2007.

In 1996, the highest proportion of male labour force was found in the manufacturing sector (9.9%). This was closely followed by those in the community, social, and personal-services sector (9.8%). Meanwhile, in 2001, the proportion of male labour force in the former (i.e. manufacturing sector) had increased to 14.8%, while that of the latter more than doubled (24.6%) in 2001. Meanwhile, as one would expect, the proportion of females in the community, social, and personal-services sector was found to be the highest in 1996 (13.6%) and almost tripled (34.9%) in 2001. Also, among the females, this sector maintained its lead in 2007, but the proportion had fallen to 12%. Generally there was a drastic drop in the proportion of male and female labour force engaged in all the sectors in 2007. This, again, may be due to data quality.

Table 11.4 shows that, in 1996, the highest proportion of the country's labour force population (29.2%) was engaged in the elementary occupations, but this proportion dropped drastically to 13.3% in 2007. This pattern could be adduced to the fact that the South African economy requires more highly skilled workers as the economy continues to expand during the postapartheid period.

A consideration of median age by occupation as shown in Table 11.5 reveals that the median ages for all categories of occupation range from 32 to 40 years. Specifically, there seems to be a general increase of one or two years in the median age of virtually all the categories of occupation during the period under study. For instance, legislators and senior officials/managers' median age increased from 39 years in 1996 to 40 years in 2001 and also remained as that in 2007. Also, the median age of the professionals steadily increased from 36 years in 1996 to 37 years in 2001 and then to 39 years in 2007.

Table 11.4 Percentage distribution of the labour force by occupation, South Africa 1996–2007

Occupation	1996	Percent	2001	Percent	2007	Percent
Legislators, senior officials, & managers	33,690	4.6	40,731	5.7	18,670	5.3
Professionals	79,620	10.8	54,035	7.5	23,260	6.5
Technicians & associate professionals	50,269	6.8	75,695	10.6	12,071	3.4
Clerks	64,686	8.8	86,004	12.0	16,562	4.7
Service workers, shop, & market sales workers	74,585	10.1	79,672	11.1	21,009	5.9
Skilled agricultural & fishery workers	32,735	4.4	18,344	2.6	11,913	3.4
Craft and related trades workers	117,459	15.9	93,924	13.1	27,016	7.6
Plant & machine operators & assemblers	69,949	9.5	67,274	9.4	18,531	5.2
Elementary occupation	215,848	29.2	200,491	28.0	47,169	13.3

Table 11.5 Median age by occupation, South Africa 1996–2007

	1996	2001	2007
Occupation	**Median age (years)**	**Median age (years)**	**Median age (years)**
Legislators, senior officials, and managers	39	40	40
Professionals	36	37	39
Technicians & associate professionals	36	37	37
Clerks	33	34	34
Service workers, shop, & market workers	32	34	34
Skilled agricultural & fishery workers	37	37	38
Craft and related trades workers	36	37	37
Plant & machine operators & assemblers	37	38	39
Elementary occupation	37	37	38

4. DISCUSSION AND CONCLUSION

In this chapter, we have examined the levels, structures, and patterns of the South African labour force. Additionally, we constructed the tables of economically active life separate for male and female. The labour force of any nation is regarded as the economically active population of that nation at any given point in time (UN, 1968). As noted earlier, the economically active population is a combination of employed persons and the unemployed persons who are seeking work for pay or profit during the reference period.

As a country in transition, the economy of the country has expanded greatly, thereby allowing those who have been previously denied free participation in the economic activities. During the postapartheid era, as the country transits through her second decade of democracy, a lot of changes are noticeable in the size and the structure of the country's labour force. These changes have been identified in this chapter.

First, the size of the country's labour force has undergone phenomenal changes during the period 1996 to 2007. For instance, females' participation in the labour force has continued to increase. This is indicative of increasing numbers of women acquiring educational skills that qualify them

to take up employment in the formal sector. It is also indicative of South Africa's progress in women's empowerment initiatives.

Second, while the size of the labour force in virtually all the provinces remained constant during the reference period, there seems to be an unusual and drastic decline in the size of the labour force population in the Gauteng Province. At the same time, the Eastern Cape Province recorded an increase in the size of it labour force during the period. Third, it was also remarkable that over the period, the dependency ratio was generally declining in the country. This suggests that while more young people are taking part in the labour force, a higher proportion of the older population also seemed to be retiring late.

Further, male and female activity rates increased over the period 1996 to 2007 in South Africa. The observed pattern of male and female activity rates over the period under study is reminiscent of a country whose economy is undergoing transitional stages. It was also observed that the activity rates of the young, unmarried men increased over the period. But, unexpectedly, the activity rates of the married men recorded a decrease. Meanwhile, as one would expect, the activity rate of the married women was much lower than that of their unmarried counterparts. As earlier noted, married women play other important roles that do not always allow them to fully participate in the economic activities.

In addition, labour force participation rate by marital status reflects sex role differences in the society. In many societies, the probability of women being engaged in economic activities varies greatly according to marital status, and consequently the age-specific activity rates of females may be influenced by women's ages at marriage. Men's marital status also seemed to have had some bearing on their participation in economic activities, but the variations according to male marital status are likely to be slight. Also, it is remarkable to observe that activity rate was highest for males with secondary level of education in 1996, but in 2007, the pattern changed. As the economy expanded in the second decade of democratisation in the country, the demand increased greatly for people with more specialized skills. Earlier in 1996, there was a generally high rate of labour force participation among people with primary education, but the rate later decreased for primary school leavers in the subsequent years to create room for workers with higher levels of education. Also, generally, the activity rates of men and women with no formal education decreased in 2007. Overall, the activity rate of people with a low level of education plummeted over the period, and people with higher level of education became increasingly sought after. This emphasises the need for increased access to and attainment of education in the country.

Another remarkable change that occurred over the 1996 to 2007 period is the decline in the labour force participation rates of teenagers. Also, female labour force participation rates were found to be generally higher than those of males over the period 1996 to 2001. But a change of pattern

was observed in 2007, as the labour force participation rate of males was found to be more than that of the females for almost all the age categories. We suggest that as family formation becomes more stable during the post-apartheid era, there is perhaps an increasing demand for men to take up employment, in both the formal and informal sectors, in order to fend for their families.

An increase was also noticed, particularly in the number of female legislators, senior officials, and managers over the period. Meanwhile, the observed increase in the number of women in politics in South Africa may be a response to the UN affirmative action aimed at increasing women's involvement in politics. UNICEF (2007) noted that equality in governance and politics is a Millennium Development Goal 3 objective (MDG3, Indicator 12) and that allowing women involvement in politics can change the societies. Going by the increase in the number of female legislators recorded during the 1996 to 2007 period, it is anticipated that more women would be found in South Africa's political arena as the country transits through her second decade of civil rule. Also remarkably, the proportion of women in the agriculture/fishery industry increased over the period, while men's proportion in the sector declined drastically in 2007.

Also, during the period under study, overall, the community, social, and personal-services sector remained the largest employer of labour. The proportion of workforce engaged in this sector almost tripled between 1996 and 2001. Expectedly, the proportion of females in the community, social, and personal-services sector was found to be the highest over the period. Also, it was observed that the highest proportion of male labour force was found in the manufacturing sector in 1996, but in 2001 the pattern changed, as the highest proportion of men were found to be engaged in the community, social, and personal-services sector. A possible explanation for this is that as the economy expands, more formal and informal job opportunities are created in the services sector. It is also important to note that the highest proportion of the country's labour force population which was engaged in the elementary occupation in 1996 dropped considerably in 2007. This pattern is expected in an emerging economy like that of South Africa. Thus, we suggest that an emerging economy tends to create more job opportunities for people with specialised skills than for those who are seeking elementary occupations.

In general, however, it was found that according to the working life tables, South Africans spend a relatively short length of time in the labour force, ostensibly due to the impact of the HIV/AIDS pandemic. Our analysis indicates that South African men in their best working-age group would spend about one seventh of their lifetime outside the labour force during the period to which the data refer. A similar pattern was found among the women. Instead of having some increases in years of economically active life due to expansion in the country's economy, tables of female length of working life indicate some losses in the length of working life between 1996 and

2007. Further, the median ages for all occupations range from 32 to 40 years during the period 1996 to 2007. Generally, only an increase of one to two years in the median age of occupations was noticed over the period, except for the median age of the professionals, which increased from 36 years in 1996 to 39 years in 2007. This increase perhaps may be a response to the need to spend more years in school in order to obtain the requirements that professional occupations demand.

As the South African economy continues to expand during the post-apartheid period, it is expected that more job opportunities would be created at the top of the occupational ladder. As a result, there would be a huge demand for skilled labour. Nonetheless, it is expected that more people would acquire a higher level of education. Meanwhile, considering the identified trends as established in this chapter, it is expected that more women than men would be qualified for professional occupations in the years ahead. The economy is expected to undergo a continuous transformation in response to the ongoing structural changes that are taking place in the country's labour force. However, the major challenge to the increase in the country's labour force participation rates largely remains the HIV/AIDS pandemic, which has a devastating effect on the labour force.

NOTE

1. According to South African 2003 Demographic and Health Survey (SADHS) report, the country's ${}_1q_0$ and ${}_5q_0$ were stable between 1998 and 2003. Hence, the same death rates were used for the period 1998 to 2003. Full report on findings of 1998 and 2003 SADHS is available elsewhere (MRC and ORC Macro, 2007).

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12 Female Labour Force Participation in South Africa
Levels, Trends, and Differentials

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1. INTRODUCTION

The participation of women in labour market activities is measured by what is known as the female labour force participation rate (FLFPR), defined as the proportion of the female population of working age that is economically active (i.e. either employed or unemployed but looking for work); (Statistics South Africa, 2010). The variety in international statistics of this concept has been discussed (Dixon, 1982, 1983), while the conceptual ambiguity of its measures has been examined by Beneria (1981).

Since the seminal work of Mincer (1962), considerable interest has arisen in the study and analysis of female labour force participation globally. One of the most striking features of the twenty-first century is the increasing number of women in the labour force. This increase has been driving employment trends and shrinking the gender gap in the labour force (Lim, 1990). While the female labour force has been increasing in many countries due to the completion of fertility, the increase is notable in developing countries with slow or stalled decline.

Women's full integration into the economy is a desirable goal for equity and efficiency conditions. Tansel (2001) noted that the equity aspect implies that the labour market participation of women will improve their relative economic position, increase overall economic efficiency, and improve the development potential of a country. Higher female labour force participation can be one of the instrumental factors in promoting equality of opportunity, higher productivity, and a higher standard of living for all (Jaumotte, 2003; Lewis, 2006).

One of the major goals of the South African government is to eradicate extreme poverty and hunger in the country by 2015 (Millennium Development Goal, or MDG, 2005). Women are prone to suffering the most as far as poverty is concerned when compared to men (World Bank, 2001). According to the Human Development Report (HDR; UNDP, 2008), women represent 70% of individuals living in poverty. One of the contributing factors to these statistics in South Africa is the rise of female-headed households. The steady rise in female-headed households and the number of

children living in female-headed households has been found to have important life-course implications for women and children. For example, a study by Casper and Bianchi (2002) indicated that changes in family composition may be attributed to many factors such as the dissolution of marital unions and the constitution of families without such unions, as well as higher male mortality. Furthermore, reports indicate that women-headed households are the poorest of the poor and that family hardships are sometimes transferred to the children, continuing the patterns of poverty (Chant, 2008).

Various studies and reports indicate that poverty alleviation can often be achieved through strategies that specifically target women (Seufert-Barr, 2008; UNDP, 2008; World Bank, 2001). Indeed, this premise is aligned with the third goal of the MGDs, which aims to promote gender equality and empowerment by increasing the share of women in wage employment in the non-agricultural sector. The common argument in these studies is that the empowerment of women to generate income can significantly reduce female vulnerability and thus reduce poverty in general. It is also argued that when a woman earns some income, she is more likely to spend it on her family. By helping women to earn an income, the well-being of the whole family is also subsequently improved (Esping-Anderson et al., 2002; Seufert-Barr, 2008). Hence, improving labour force participation and employment among women is one of the ways to increase women's economic empowerment.

This chapter examines the participation of women in the South African labour market by determining not only levels of participation but also trends in women's labour force participation, determining factors that play a role in influencing their participation. This is important in influencing policy decisions regarding increasing women's economic productivity and achieving gender equality.

2. DATA SOURCES AND METHODOLOGY

This study utilises data collected in the Labour Force Surveys (LFS) and the Quarterly Labour Force Surveys (QLFS) over the five-year period 2006 to 2010. The Labour Force Surveys were undertaken biannually, and the Quarterly Labour Force Surveys are undertaken four times per year. Use has been made of the March Labour Force Surveys for the period 2006 to 2007 and the first quarter of the Quarterly Labour Force Surveys for the period 2008 to 2010. All datasets are in the public domain and are available on the website of Statistics South Africa (www.statssa.gov.za).

The first Labour Force Survey was conducted in 2000. Since then, it was undertaken on a six-monthly basis in March and September of each year. It was a biannual household survey, specifically designed to measure labour market issues in South Africa at national level. It provided insight into the labour market, including the level and pattern of employment and

unemployment and the industrial and occupational structure of the economy. Information was collected about the labour market situation of adults of working age (15–65 years). The households living in sampled dwelling units in each of the nine provinces were visited by field staff employed and trained by Stats SA. The design of the questionnaires and definitions used conformed to the requirements set by international bodies such as the International Labour Organisation (ILO).

Information was collected concerning 68,386 adults of working age living in more than 30,000 households across the country during the Labour Force Survey 13 (LFS 13) during March 2006. The Labour Force Survey 15 (LFS 15) collected information on 74,591 adults of working age living in 30,000 households across the country during March 2007.

Stats SA undertook a major revision of the Labour Force Survey (LFS) during 2006 and 2007 which incorporated changes to the survey methodology, the survey questionnaire, the frequency of data collection and data releases, and the survey data capture and processing systems. The QLFS is now the principal vehicle for collecting labour market information on a quarterly basis. Details of key changes have been documented elsewhere (Statistics South Africa, 2008).

The first QLFS was conducted over the period January to March 2008 (Q1: 2008). Data on 95,186 persons were collected. The 2009 first quarter enumerated 92,777 persons (Statistics South Africa, 2008). The first quarter 2010 QLFS enumerated 97,328 persons. All records containing missing or unspecified data in respect of the variables studied have been dropped. Only records in respect of persons aged between 15 and 64 years of age have been used in the analyses. All data have been weighted to represent the full population of South Africa (Statistics South Africa, 2010).

2.1. Methodology

The study is divided into two main parts and examines trends on the response variables over the period 2006 to 2010. The first part examines the influence of the predictor variables on the female labour force participation rate. Descriptive statistics were used at the bivariate level. Population groups were then introduced into the analyses in order to determine if the predictions were different for each of these. Logistic regression analyses were then used at the multivariate level to determine whether the outcome of participation found on the bivariate level would persist.

The second part provides analyses of participating females who are actually employed. In order to ascertain how the employment of women in the country has evolved, the analyses focus on trends in employment by making comparisons between the years 2006 and 2010. It also compares these trends to those of males in order to provide context to the findings. These trends are assessed with specific reference to demographic variables (age, marital status, population group, and geographic location), household

composition (number of minor children and household size), and industry and occupation profiles.

3. FINDINGS

3.1. Female Labour Force Participation

Table 12.1 shows how women of working age in South Africa were distributed according to various demographic and socioeconomic factors over the period 2006 to 2010. No major changes are shown between 2006 and 2010.

The gender composition of the labour force has remained constant over the period 2006 to 2010, with the number of females of working age (15 to 64 years) consistently exceeding the number of males. On average, the proportion of females to males was 52.1% to 47.9%. The proportion of participating males has consistently exceeded that of participating females. Over the period 2006 to 2010, the female participation rate has consistently remained at an average of 50%, 14% lower than that of males, which averaged 64% over the same period.

3.2. Demographic and Socioeconomic Factors and Female Labour Force Participation Rate

Other studies have shown that women's participation by race indicates that the participation rates for historically disadvantaged groups such as Black Africans, who form on average 78% of the female labour force, were significantly lower than those of Whites (Adelzadeh et al., 2001; Ntuli, 2007). This phenomenon was still valid in 2010. It is believed that the differences observed between the participation of Black Africans and White women in the labour market are largely rooted in the historical experiences of the two groups, so that, even in postapartheid South Africa where equality is a constitutional right for all, the residue of historical practices may still be observed (Casale and Posel, 2002). Female participation in the labour force in South Africa during the period under investigation shows that Black African and Indian/Asian women's participation is lower than those of the White and Coloured population groups.

It can be seen in Table 12.2 that the participation rate increases by age up to age group 35 to 44 and decreases thereafter. Although females within the 15 to 24 age group form 31% of the female labour force, their participation rate is relatively low.

Each population group follows a similar participation pattern to that of the general population, in that each group participates more between the ages of 25 and 54. Participation is at its highest for all population groups between the ages of 25 and 34 except for Black African females, who are, on average, participating more between the ages of 35 and 44. Coloured

Table 12.1 Percentage distribution of women of working age according to specific characteristics by year of survey, South Africa 2006–2010

		2006	2007	2008	2009	2010
Predictive variables	**Differentials**	%	%	%	%	%
Population groups	Black African	78.0	78.1	77.9	78.1	78.2
	Coloured	9.0	9.3	9.5	9.5	9.6
	Indian/Asian	3.0	2.7	2.7	2.7	2.8
	White	10.0	10.0	9.8	9.6	9.4
Age	15–24	31.0	30.3	31.0	30.9	30.9
	25–34	27.0	27.1	26.6	26.3	26.1
	35–44	18.0	18.2	18.5	18.7	18.9
	45–54	14.2	14.3	14.2	14.3	14.2
	55–64	9.8	10.2	9.6	9.8	9.9
Education	No schooling	7.0	6.8	6.0	5.6	5.1
	Less than primary	13.4	12.7	11.7	11.3	10.6
	Primary	7.1	6.7	6.5	6.0	5.7
	Less than secondary	41.5	42.8	43.9	43.4	44.0
	Secondary	28.3	28.0	28.9	30.4	31.5
	Tertiary	2.7	2.9	2.9	3.3	3.1
Marital status	Married	30.2	30.1	30.5	29.2	28.7
	Cohabiting	8.4	8.3	8.7	8.5	8.5
	Widow	6.1	6.3	5.8	5.9	5.9
	Divorced	3.1	3.2	3.5	3.3	3.0
	Never married	52.2	52.1	51.4	53.0	53.9
Province	Western Cape	10.5	10.9	11.1	11.1	11.2
	Eastern Cape	13.9	13.9	13.3	13.2	13.2
	Northern Cape	1.9	1.9	2.3	2.3	2.4
	Free State	6.4	6.5	6.2	6.0	6.1
	KwaZulu-Natal	21.0	20.4	20.6	20.9	20.8
	North West	8.0	8.0	6.9	6.9	6.9
	Gauteng	20.0	20.0	21.7	21.4	21.6
	Mpumalanga	6.8	6.7	7.0	7.1	7.2
	Limpopo	11.5	11.7	10.8	10.8	10.6
No of minor children	0	45.2	46.4	46.9	48.5	48.0
	1–2	48.2	47.3	45.6	44.0	44.6
	3 or more	6.6	6.3	7.4	7.5	7.4
No of household members	1 to 2	13.9	16.0	16.5	16.6	15.6
	3 to 4	31.3	31.9	30.9	31.6	32.3
	5 or more	54.8	52.1	52.6	51.7	52.1
Household head	Household head	24.5	26.3	26.5	27.0	26.2
	Household member	75.5	73.7	73.5	73.0	73.8

females are more likely and Black African females are less likely to participate within the age group 15 to 24. Whites are the highest participants within the age group 25 to 64.

Persons with at least a secondary school qualification and those having a tertiary qualification are more likely to be participating in the labour force. There does not seem to be any significant difference between the participation rates of persons on all levels of education of less than secondary schooling. It will be noted that, for each population group, participation generally increases as educational levels increase. The participation rates for Black African and Coloured females are much higher than those of Indian/Asians and Whites at all levels. This finding differs from that observed when participation was measured solely by population group, where it was found that White females maintained the highest level of participation.

Female labour force participation rate by marital status shows that the participation of divorced persons, who formed only an average of 3.2% of the female labour force between 2006 and 2010, is consistently higher than that of other groups and maintains an average participation rate of 68%. The participation of married persons and persons who are cohabiting maintains a consistency similar to each other of between 56% and 59% over the period 2006 to 2010 and is higher than those of widows or those who have never married. The participation rate of widows has dropped slightly over the five-year period.

Cohabiting persons have the second-highest participation rate. Widows are found to be the lowest labour force participants for all population groups, together with persons who had never married for Black African and White females. Although persons who have never married have a relatively low participation rate when compared to the other groups (except widows), they formed, on average, 52.5% of the workforce over the period 2006 to 2010.

Although the annual female participation rate between 2006 and 2010 varies per province, Western Cape and Gauteng consistently have the highest participation rates. Limpopo Province has the lowest participation rate, followed by Eastern Cape Province.

The female participation rate falls as the number of children in the household increases from no children to three or more children. The female labour force participation rates for all population groups, except Indian/Asians, is above 50% when there are no minor children in the household. The average participation rates of Black Africans drop from 53.2% when there are no children to 36.1% when the number of minor children increases to more than three. The average participation rate of Coloured females remains above 50% irrespective of the number of children. That of Whites actually increases when there are minor children in the household. The participation rate of Indians/Asians is only slightly affected once there are minor children in the household. Overall, an increase in the number of minor children seems to affect Black African females more than the other population groups.

Table 12.2 Per cent distribution of females participating in the labour force by demographic and socioeconomic factors, South Africa 2006–2010

		2006	2007	2008	2009	2010
Predictive variables	**Differentials**	**%**	**%**	**%**	**%**	**%**
Population groups	Black African	48.1	48.4	49.1	48.4	45.3
	Coloured	57.2	58.8	57.4	59.3	58.0
	Indian/Asian	42.6	41.7	47.2	44.7	45.6
	White	60.9	59.5	62.9	62.5	60.8
Age	15–24	28.3	27.8	28.1	26.5	23.5
	25–34	66.0	67.5	67.4	67.3	64.5
	35–44	66.0	66.7	69.6	69.2	67.8
	45–54	58.9	57.6	59.6	60.4	56.6
	55–64	32.6	32.0	32.5	32.4	30.2
Education	No schooling	38.5	34.5	34.4	32.8	28.6
	Less than primary	44.1	43.3	41.8	40.0	36.6
	Primary	42.8	43.5	41.3	41.3	39.2
	Less than secondary	41.5	42.6	41.8	40.9	38.6
	Secondary	66.8	67.3	70.8	69.7	65.6
	Tertiary	84.2	83.0	89.2	86.3	86.1
Marital status	Married	57.5	56.7	57.3	56.3	54.3
	Cohabiting	55.9	60.0	59.4	60.3	57.0
	Widow	46.4	45.3	45.0	42.9	42.2
	Divorced	68.7	64.0	68.6	70.9	67.6
	Never married	44.1	44.8	45.5	45.6	42.6
Province	Western Cape	61.0	62.2	59.2	61.1	60.8
	Eastern Cape	49.7	43.0	41.2	42.4	41.5
	Northern Cape	48.2	50.8	48.5	46.2	45.6
	Free State	50.9	49.8	53.1	51.7	48.8
	KwaZulu-Natal	47.5	48.4	47.7	45.1	41.8
	North West	44.8	46.9	42.5	46.3	37.8
	Gauteng	58.8	60.1	66.6	65.3	62.7
	Mpumalanga	48.8	50.7	45.9	49.9	47.2
	Limpopo	34.2	36.6	38.9	35.9	31.3
No of minor children	0	53.6	53.5	56.1	55.5	53.4
	1–2	48.3	48.5	48.0	47.5	44.4
	3 or more	39.2	39.3	38.3	38.2	33.9
No of household members	1 to 2	65.2	65.7	66.7	65.9	62.6
	3 to 4	55.0	53.6	55.4	54.9	52.8
	5 or more	43.4	43.5	43.7	43.2	40.4
Household head	Household head	61.5	60.6	62.2	61.3	57.9
	Household member	46.3	46.6	47.1	46.7	44.4

3.3. Multivariate Analyses

In this section, we examine the effects of the various predictive demographic and socioeconomic variables on the likelihood of females to participate in the South African labour market through bivariate and multivariate modelling.

As can be seen from Table 12.3, Coloured females have been the group most likely to participate in the labour market over the period 2006 to 2010. They are followed by Black Africans, but the differences in the odds ratios between Black Africans and Coloureds are not significant for 2006 and 2007. The differences become more significant towards 2010. Indians/Asians have the lowest likelihood of participation. It was found that most females participate between the ages of 25 and 54, with the participation rate peaking between the ages of 35 and 44. The odds of participating are significantly lower for the 15 to 24 age group than for any of the other age groups because it includes the school-going age group.

The odds of females participating in the labour force increase positively with the level of education. The odds of participation are, however, even more dramatic once a tertiary education has been obtained. The odds of participating with a secondary or tertiary education, as opposed to any other educational level, have also increased over the 2006 to 2010 period. The odds of participating with a secondary education were 3.8 times and that of participating with a tertiary education 7.8 times that of participating with no education during 2006. These numbers increased to 5.8 times and 14.7 times as much in 2010. Thus the higher the levels of education, the more likely South African women are to participate in the labour force.

On the multivariate level, it was found that widows had the lowest odds of participating throughout the 2006 to 2010 period. Divorced or separated females maintained the highest odds of labour market participation over the same period. The odds of participation for cohabiting persons and persons who have never married have become more significant (greater than) the odds of participation for those of married females over the period 2008 to 2010. The odds of participating in Limpopo Province are the lowest over the period 2006 to 2010 when compared to all the other provinces. Those of Gauteng and Western Cape are the highest. The odds of participation, when compared to Limpopo, are significant for all provinces over this period except for North West Province for the years 2008 and 2010.

The findings on the multivariate level echo those found on a bivariate level. The odds of participating increase as the number of minor children in the household decreases. The results only become significant in 2009, however. The odds of participation when there are one to two household members are significantly higher when compared to households with more members over the period 2006 to 2010. The participation of females in the labour market becomes highly significant when they become heads of households.

3.4. Characteristics of Females in the South African Labour Market

Having examined the determinants of female labour force participation, the analysis now focuses on which factors influence employment. It also looks at the extent to which females are employed in the different types of industries and occupations.

No dramatic changes took place among the employed over the period 2006 to 2010, whereas the proportion of discouraged job seekers decreased simultaneously with a significant increase in the proportion of females who became economically inactive. The proportion of economically inactive females increased from 38.4% in 2007 to 44.3% in 2008 and remained steady at 44.9% in 2009 and 45.7% in 2010. The proportion of discouraged work seekers decreased from 9.8% in 2007 to 4.6% in 2008, maintaining levels of 4.4% in 2009 and 6.4% in 2010. This seems to indicate that a number of discouraged job seekers have become discouraged due to the lack of job opportunities and have chosen to become economically inactive.

3.5. Employment Rates

Since 2006, the average proportion of women who were employed was 72.7% compared to an average of 27.3% who were unemployed.

3.6. Characteristics of Employed Females

It is necessary to compare the employment patterns of both sexes in order to determine if there are any differences. The number of employed men has, since 2004, been consistently higher than that of women. In 2009, only 5.9 million women aged 15 to 64 were working, compared to 7.3 million men. This reflects in part the lower participation rate of women; that is, a lower percentage of women than men are available for employment.

It shows that residuals of past discriminatory labour policy laws, which left Black African women as the most disadvantaged among all population groups and White women as the most advantaged in regard to employment, are still evident. Indian/Asian females have the second-highest employment rates and Coloureds the second lowest. These findings are consistent over the period 2006 to 2010. The results indicate an unvarying positive relationship between employment and age, with higher proportions of older women in employment compared to younger women. This is different from the female participation rates, where it was found that the highest rates of participation were between the ages of 25 and 54, peaking between the ages of 25 and 44.

The expectation was that higher education would enhance the employment profile of women. The results, however, indicate that the highest employment rates are recorded by those with no schooling and those with tertiary-level education. These results could be attributed to most women in

Table 12.3 Logistic regression results (odds ratios) of female participation in the labour force by demographic and socioeconomic characteristics, South Africa 2006–2010

Variable	2006	2007	2008	2009	2010
Population group					
Black African	1.000	1.000	1.000	1.000	1.000
Coloured	1.097	1.149	1.162*	1.222**	1.217**
Indian/Asian	0.416***	0.417***	0.519***	0.514***	0.644***
White	0.668***	0.625***	0.673***	0.627***	0.768***
Age					
15–24	1.000	1.000	1.000	1.000	1.000
25–34	3.981***	4.348***	4.843***	5.477***	5.766***
35–44	4.419***	4.896***	5.950***	7.027***	7.335***
45–54	3.520***	3.701***	4.505***	5.749***	5.492***
55–64	1.102	1.265**	1.400***	1.813***	1.727***
Education					
No schooling	1.000	1.000	1.000	1.000	1.000
Less than primary	1.165*	1.359***	1.308***	1.350***	1.400***
Primary completed	1.265**	1.452***	1.380***	1.563***	1.619***
Less than secondary	1.409***	1.788***	1.809***	1.973***	1.948***
Secondary completed	3.832***	4.529***	5.976***	6.542***	5.776***
Tertiary	7.833***	8.350***	14.948***	14.483***	14.724***
Marital Status					
Married	1.000	1.000	1.000	1.000	1.000
Cohabiting	1.054	1.183*	1.288***	1.406***	1.406***
Widow	0.849*	0.894	0.872*	0.923	1.098
Divorced	1.349**	1.152	1.410***	1.740***	1.696***
Never married	0.969	0.970	1.113*	1.346***	1.320***
Province					
Limpopo	1.000	1.000	1.000	1.000	1.000
Western Cape	2.567***	2.420***	1.808***	2.090***	2.608***
Eastern Cape	2.100***	1.341***	1.107	1.326***	1.556***
Northern Cape	1.723***	1.724***	1.322***	1.418***	1.578***
Free State	1.886***	1.584***	1.669***	1.766***	1.899***
KwaZulu-Natal	1.848***	1.706***	1.449***	1.454***	1.440***
North West	1.467***	1.478***	1.001	1.315***	1.103
Gauteng	2.219***	2.173***	2.361***	2.511***	2.713***
Mpumalanga	1.873***	1.800***	3.336***	1.801***	2.014***
Number of Minor Children					
3 or more children	1.000	1.000	1.000	1.000	1.000
1 to 2 children	1.118	1.127	1.104	1.147*	1.123
No children	1.149	1.382	1.242**	1.287***	1.329***

(*Continued*)

Table 12.3 (Continued)

Variable	2006	2007	2008	2009	2010
No. of HH Members					
5 or more members	1.000	1.000	1.000	1.000	1.000
3 to 4 members	1.633***	1.067	1.085*	1.089*	1.059
1 to 2 members	1.569***	1.677***	1.537***	1.496***	1.395***
Household Heads					
Household members	1.000	1.000	1.000	1.000	1.000
Household heads	1.705***	1.574***	1.639***	1.532***	1.459***

Legend: $*p < 0.05$, $**p < 0.01$, $***p < 0.001$

South Africa being employed in elementary occupations. The highest proportions of employed women were consistently reported among divorced or widowed women. The result for divorced women is not surprising, because it agrees with the result for participation. The result for widows is, however, surprising because this group was shown to be the lowest among participants, along with those who were never married.

Between 2006 and 2009, the Western Cape Province had the highest female employment rates, followed by KwaZulu-Natal. In contrast, however, 2010 saw KwaZulu-Natal overtaking the Western Cape as the province with the highest rates. Further analyses show that while the country experienced inconsistent trends in terms of growth in female employment across many provinces, the Western Cape was the only province to exhibit an uninterrupted slight downward trend in the proportions of females in employment. On the other hand, KwaZulu-Natal and Limpopo experienced consistent increases in proportions of employed women throughout the five-year period of reporting (2006 to 2010), with the biggest growth occurring in Limpopo.

Studies have cited the dual role of women as employees and as primary family caregivers as a potential reason for women's failure to be active participants in the labour market (Leucken et al., 1997). In the five-year period of reporting (2006 to 2010), women with no minor children and those with one or two minors, as well as those living in smaller households, were more likely to be employed.

3.7. Multivariate Analysis

This section examines the effects of the various demographic and socioeconomic variables on the likelihood of participating females being employed through multivariate modelling.

Results show Coloured females to be the most likely to be employed, followed by White women. The odds of being employed are lowest for females between the ages of 15 and 24, while the odds of being employed

Table 12.4 Percentage of female participants who are employed by demographic and socioeconomic characteristics, South Africa 2006–2010

		2006	2007	2008	2009	2010
Predictive variables	**Differentials**	**%**	**%**	**%**	**%**	**%**
Population groups	Black African	63.6	63.5	68.4	69.1	67.8
	Coloured	80.3	77.0	79.5	81.2	78.1
	Indian/Asian	89.8	82.1	85.0	86.9	89.4
	White	93.8	95.4	93.3	94.3	93.1
Age	15–24	43.6	40.5	49.8	47.2	45.3
	25–34	64.5	64.1	67.7	67.3	66.9
	35–44	77.5	78.3	79.9	82.3	80.7
	45–54	86.6	85.8	89.5	91.7	88.4
	55–64	95.8	94.5	94.8	95.8	93.6
Education	No schooling	77.2	78.9	84.5	85.8	84.7
	Less than primary	74.8	74.2	76.2	81.2	78.0
	Primary	70.4	68.6	76.2	80.3	73.6
	Less than secondary	61.4	60.5	64.7	65.0	65.0
	Secondary	70.9	71.7	75.3	75.0	74.2
	Tertiary	97.2	93.2	95.0	95.3	93.4
Marital status	Married	82.1	80.4	82.2	87.0	84.9
	Cohabiting	65.4	61.4	65.6	67.6	68.5
	Widow	86.3	85.6	88.3	89.6	89.7
	Divorced	86.3	86.8	89.7	89.5	84.4
	Never married	57.5	58.9	64.4	63.1	62.2
Province	Western Cape	82.7	81.0	79.5	79.4	79.5
	Eastern Cape	76.8	71.5	71.6	69.1	69.7
	Northern Cape	71.1	64.6	69.6	67.1	70.3
	Free State	61.8	65.3	69.8	70.3	69.4
	KwaZulu-Natal	66.9	67.8	75.0	76.1	80.9
	North West	59.3	59.4	72.8	69.9	67.6
	Gauteng	70.9	69.6	72.8	74.5	68.3
	Mpumalanga	64.6	66.6	72.2	73.2	67.4
	Limpopo	58.4	62.8	65.3	71.5	72.2
No of minor children	0	76.2	77.1	79.9	80.0	79.4
	1–2	64.6	62.0	66.4	67.5	65.0
	3 or more	52.6	54.5	60.9	62.0	63.7
No of household members	1 to 2	81.9	80.6	83.5	83.7	82.7
	3 to 4	74.9	73.3	75.4	77.0	76.4
	5 or more	61.0	60.6	66.2	66.6	64.8
Household head	Household head	83.2	83.1	83.9	84.2	82.6
	Household member	63.8	62.6	67.8	68.8	68.0

are the highest for females between the ages of 25 and 54. The likelihood of employment is shown to decrease from the age of 55. As expected, the odds of being employed increase by the level of education, particularly for those with tertiary education. Education is seen to be a strong determinant for employment. The odds of being employed with a tertiary education range from seven to twelve times higher than those for females with no education over the period 2006 to 2010.

The odds of females being employed are higher in other provinces than in Limpopo. The odds of women being employed are shown to be significantly higher over the period 2006 to 2010 for females with no minor children compared with the odds of participation of those having three or more children. The odds of participation when there are one to two minor children in the household are not significantly different from those for having three or more minor children. The odds of women being employed decrease as the number of household members increases. The odds for employment as a household head are higher than those for participation.

3.8. Employed Females by Industrial and Occupational Profile

Knowledge of whether females are employed or not employed does not necessarily provide sufficient information on the employment achievements of women. There is a need to provide a context within which more meaningful comparisons can be made. For this purpose, an examination is made of industries in which women are employed and the types of occupations they follow, and these are compared to those of males.

3.9. Employed Females by Industry

This section focuses on the employment of females by industry and compares it to that of males. In 2009, an equal share of men and women were employed in the trade industry. However, men dominated in all other industries except in community and social services and private households. A higher proportion of men were employed in goods-producing industries such as manufacturing, mining, and construction. In the year 2009, 88.5% of all persons who were employed within the construction industry were men. Similarly, among those who were employed in mining, 87.1% were male, while 67.0% of working individuals in manufacturing were also male.

The highest proportions of employed women have consistently been concentrated within the trade industry and the community and social services industry, followed by private households, over the past five years (2006 to 2010). Whereas the number of women within trade has been continuously declining since 2006, women have steadily increased their share of employment within community and social services, overtaking trade as the leading female-employing industry since 2007. Although gender disparities are

pronounced within specific industries, of interest is the increase in the share of women employed within traditionally male-dominated industries in the last five years. It is shown that the proportion of women within the financial industry increased from 9.5% in 2006 to 12.1% in 2008 (an increase of 2.6%). Similar increases were observed in the mining, transport, and construction industries.

Table 12.5 Logistic regression results (odds ratios) of employed females

Variable	2006	2007	2008	2009	2010
Population group					
Black African	1.000	1.000	1.000	1.000	1.000
Coloured	1.464***	1.443***	1.465***	1.639***	1.431***
Indian/Asian	0.817	0.680**	0.742**	0.745**	0.875
White	1.128	1.301**	1.207**	1.135	1.317***
Age					
15–24	1.000	1.000	1.000	1.000	1.000
25–34	3.641***	4.334***	4.301***	4.724***	5.352***
35–44	5.053***	6.566***	6.336***	7.607***	8.434***
45–54	5.042***	5.893***	6.217***	7.747***	7.536***
55–64	1.895***	2.417***	2.196***	2.672***	2.688***
Education					
No schooling	1.000	1.000	1.000	1.000	1.000
Less than primary	1.149	1.240**	1.153*	1.306***	1.283**
Primary completed	1.169	1.206*	1.276**	1.558***	1.445***
Less than secondary	1.183*	1.386***	1.401***	1.535***	1.610***
Secondary completed	2.720***	3.164***	3.958***	4.263***	4.131***
Tertiary	8.689***	6.972***	12.154***	11.309***	11.411***
Marital Status					
Married	1.000	1.000	1.000	1.000	1.000
Cohabiting	0.937	0.933	0.986	0.986	1.099
Widow	0.696***	0.748***	0.814**	0.751***	0.944
Divorced	1.069	1.006	1.327***	1.314**	1.244*
Never married	0.726***	0.802***	0.901*	0.896*	0.915
Province					
Limpopo	1.000	1.000	1.000	1.000	1.000
Western Cape	2.967***	2.529***	1.854***	1.729***	2.074***
Eastern Cape	2.717***	1.482***	1.182*	1.110	1.265**
Northern Cape	1.760***	1.382***	1.203*	1.000	1.216*
Free State	1.564***	1.390***	1.510***	1.386***	1.418***
KwaZulu-Natal	1.949***	1.698***	1.709***	1.557***	1.635***
North West	1.349***	1.222*	1.162*	1.154*	0.922
Gauteng	2.238***	1.916***	1.930***	1.868***	1.591***
Mpumalanga	1.889***	1.704***	1.517***	1.693***	1.515***

(*Continued*)

Table 12.5 (Continued)

Variable	2006	2007	2008	2009	2010
Number of Minor Children					
3 or more children	1.000	1.000	1.000	1.000	1.000
1 to 2 children	1.233*	1.126	1.099	1.101	1.011
No children	1.356***	1.371***	1.394***	1.357***	1.342***
No. of HH Members					
5 or more members	1.000	1.000	1.000	1.000	1.000
3 to 4 members	1.250***	1.130**	1.103*	1.133**	1.154***
1 to 2 members	1.626***	1.598***	1.533***	1.529	1.509***
Household Heads					
Household members	1.000	1.000	1.000	1.000	1.000
Household heads	2.287***	2.147***	1.940***	1.842***	1.732***

Legend: $*p < 0.05$, $**p < 0.01$, $***p < 0.001$

3.10. Employed Females by Occupation

Since 2006, a considerable proportion of employed females have been working in relatively lower-skilled occupations such as elementary, followed by domestic work and clerical jobs. This proportion has been declining since 2006, whereas the proportion of women employed within clerical work has increased. The share of women in top management positions, unfortunately, has not increased significantly. Women's share of professional jobs increased by only 1.4% between 2006 and 2010. Women's share of managerial positions in the country ranged between 4.4% and 5.0%, indicating that women are markedly underrepresented in top management positions with no sign of improvement, compared to their overall share of employment. The proportion of female technicians increased slightly in 2010, by 2.1% (up from 12.3% in 2006 to 14.4% in 2010).

3.11. Occupation by Sex, Education, Age, and Population Group

In 2009, the proportion of men employed in more skilled occupations was higher than that of women. When occupation categories were disaggregated at a lower level, there were more than twice as many male managers as there were women managers (69.6% as opposed to 30.4%). In addition, men constituted a higher proportion among professionals (53.5%) compared to women (46.5%). In contrast however, there were more female technicians (54.3%) than there were male technicians (45.7%).

The likelihood of being in more skilled occupations such as managerial, professional, and technical occupations generally increases with the level of educational attainment. Gender contrasts, however, were noticeable.

Results further indicate that among women, a higher proportion in managerial positions had tertiary education compared to men in such positions.

4. DISCUSSION

This chapter looked at demographic and socioeconomic factors that may influence the participation and employment of females in the South African labour market. Characteristics of employed women were also analysed. For example, being employed as such does not necessarily denote success in the labour market. Are females who are employed playing meaningful roles, or do patriarchal systems/historical restrictions still condemn females to menial labour? This was determined by looking at the industries and occupations that characterise employed females.

Various demographic and socioeconomic factors were tested as possible determinants of participation and employment on the bivariate as well as on multivariate levels. The results of the multivariate analyses did not always concur with the findings of the analyses at bivariate level, which indicated that some factors did not always have independent effects on participation and employment.

Overall, the results indicate that the rate of women's participation in the South African labour market has remained fairly consistent over the last few years, but it was deemed important to ascertain what this implied for the various population groups because of the historical connotation, where population identification has always featured as one of the main determinants of available opportunities in the labour market. Despite the new political dispensation over the last sixteen years, it was found that on a bivariate level, among the different population groupings, White females still proportionally dominate participation in the labour market. Contrary to expectations, Black Africans do not appear to be increasing their participation rate, which is the lowest among all the population groupings. Coloureds were shown on the bivariate level to have the second-highest participation rate. The multivariate model, however, shows that the odds of Coloured females (and not White females) participating are consistently higher than all the other population groups. The difference in odds of participating between Coloured and Black African females was, however, not significant over the period 2006 to 2008, differing only by between 4% and 8%. The difference became significant during 2009 and 2010, with a difference of 15% in the odds, with Coloured females having the highest odds. This finding is an indication that although on a high level it may seem that the proportion of White females participating continues to exceed that of Black African females, this is not the case when participation is controlled by other factors on a multivariate level.

The analyses, on a bivariate level, show that White females have a higher proportion of employment than any of the other population groups, Indians/

Asians the second highest, and Black African females the lowest. On a multivariate level, however, it was found that Coloured females have the highest odds (which ranged between 43% and 63% higher than those of Black African females) of being employed. These results, which are consistent over the 2006 to 2010 period, show that there is still a problem in achieving equity in employment between the population groups.

The results found on the bivariate and multivariate levels concurred when testing for the effect of education on participation. Persons with a secondary or tertiary education have a much higher likelihood of participating in the labour force than those with lower levels of education. This result is not unexpected but does emphasise the need to devote more quality resources in order not only to ensure the availability of more females in the labour market but also to halt the perpetuation of poverty within the many families belonging to the formally disadvantaged population groups. Actual employment did not reflect the same results as participation, in that persons with either a tertiary education or no schooling were more likely to be employed. This finding is not surprising, since the data show that the majority of South African women are still mostly in elementary jobs, such as domestic work.

The most prolific female labour market participants are found between the ages of 25 and 44. Participation decreases from the age of 45. Labour market participation is lowest between the ages of 15 and 24 and 55 to 64. This could be ascribed to the number of persons who are still engaged in improving their educational qualifications on the one hand and those that are seeking either early retirement or medical retirement on the other hand. Divorced or separated females maintained the highest odds of labour market participation and employment.

It was found consistently over the period 2006 to 2010 that both participation and employment decreased as the number of minor children or household size increased. These results suggest that the absence of minor children or maintaining smaller family sizes (implying lesser family responsibility) could free women to be participants in the labour market, thereby increasing their chances of gaining employment. This assumes that females affected in this way might not have alternative means of care for their children.

In analysing the female labour force participation rate, it is not only the numbers of those participating and employed that are important but also the quality of work undertaken. Women have not yet penetrated industries which have been historically dominated by males, such as construction, mining, and utilities. Most women were found to be concentrated in employment such as private households and community and social services and were equally distributed with men within trade.

It was found that fewer women occupied skilled managerial or professional positions than their male counterparts. One of the factors contributing to the lack of women in more highly skilled occupations can be stated as the lack of women's participation in the workplace. However, there are

additional inhibiting factors which can explain the slow rate in the increase of women within these occupations. For example, the literature has alluded to socialisation and the complex traditional ways in which the ranks of management are filled (Srinivasan, 2003; Thomsen, 2004). These studies argue that management jobs are largely based on socialisation into the corporate culture. Socialisation is the act of training a person to fit into a particular culture or environment. Furthermore, the studies state that the founders of these corporations traditionally establish the corporate culture and, with upper management, maintain this culture through reward systems, rules, policies, and procedures.

5. CONCLUSION

This study showed that gender equality has not yet been achieved in South Africa; that even though certain factors may increase the likelihood of women's participation in the labour market, participation does not automatically result in employment. The effects of the predictor variables on employment were found to differ with those found in respect of participation. Further, women have not yet established themselves on an equal footing with men in jobs requiring higher skills or in traditionally male-dominated industries.

It can, therefore, be concluded that the potential contribution of females to the South African labour market is still unrealised compared to potential contribution by males. This disparity has been shown to be a collective result of the demographic and socioeconomic factors that have been highlighted in this study. Of concern is that despite a new political dispensation for the last sixteen years, no noticeable improvements have been observed between 2006 and 2010.

Although official policies exist to enhance employment equity, the results of this study indicate that implementation strategies should be reviewed for effectiveness to ensure that provision is specifically made for targeted employment initiatives.

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13 Demography of Poverty and Inequality in South Africa

Sandile Simelane and Kefiloe Masiteng

1. INTRODUCTION

Contrary to the common practice of using income or expenditure data to measure and study patterns of poverty in a population, this study uses a composite index of household assets and capabilities data—hereafter called the assets and capabilities index (ACI). The ACI examines levels and trends of assets and capabilities poverty (ACP) for provinces, district councils (DCs), and local municipalities of South Africa during the period 1996 to 2007.

Three factors account for this approach. First, the country's overarching socioeconomic policy framework—the Reconstruction and Development Program (RDP)—requires government to meet *basic needs* for all people in the country (African National Congress, 1994). Among other things, the RDP requires the government to provide adequate housing, electricity, telecommunications, piped water, and sanitation to all households—particularly among the groups that were disadvantaged during the apartheid era. Additionally, one of the main priorities of the country's macroeconomic strategies—for example, Growth, Employment and Redistribution (GEAR)—is to support the implementation of the RDP by creating an economic environment that is conducive for sustainable growth and characterized by sufficient employment opportunities to speed up income redistribution and expand social service delivery (Department of Finance, 1996).[1] Thus, a poverty measure that incorporates most (or all) of the key areas targeted by the policy frameworks in its computation is needed to provide a multidimensional picture about the living conditions in the country and also to complement the poverty measures that are derived from income and expenditure data.

The second motivating factor for the approach adopted here is that income data are poorly measured in developing countries (Bollen, Glanville, and Stecklov, 2001; World Bank, 1995), including South Africa (Statistics South Africa, 2000), which is why researchers often resort to expenditure data. The third reason for using the composite index developed to measure poverty in this chapter is that it has been found to be a good measure of wealth in other developing countries (Filmer and Pritchett, 1998, 2001).

The study employs three datasets—the 1996 and 2001 censuses and the 2007 Community Survey (CS)—to answer the following questions about ACP in South Africa: (1) What has been the trend in poverty levels in South Africa between 1996 and 2007? (2) How are the poor geographically distributed in the country? (3) What are the defining characteristics of the poor in South Africa?

The rest of the chapter is organized into five sections as follows: section 2 sets the stage for the definition of poverty used in the chapter by providing an overview of the major theories, definitions, concepts, and measures of poverty. Section 3 reviews major poverty studies that are specific to South Africa—highlighting key findings and the major data sources used and how the theories, concepts, and measures discussed in section 2 have been applied in poverty research in the country. Section 4 presents the conceptual framework of the study and a description of the data and the methods used for analysis. Section 5 presents the results. The chapter concludes with a discussion of important findings in section 6.

2. BACKGROUND: THEORY, DEFINITION, CONCEPTS, AND MEASURES OF POVERTY

2.1. Theory

Poverty research has been dominated by two schools of thought since the second half of the twentieth century (Voss et al., 2006). On one hand, there are theories that attribute poverty to structural forces (e.g. uncertainty in regional economies) over which individuals have limited or no control. On the other hand, there are micro-level explanations that attribute poverty to family compositional forces and individual behavioural traits. The theories are numerous; one cannot cover all of them in this piece. This section only provides an overview of the theory that forms the basis of the poverty measure developed in the study—that is, Rawls's (1971) theory of justice as fairness. Detailed explanations of other major theories of poverty can be found elsewhere in literature.

Rawls's (1971) theory is of justice as fairness—is not necessarily a theory of poverty. Rather, it is a general social theory. However, because it attempts to solve the problem of distributive justice (Myles and Picot, 2000; Roemer, 1996), it bears important contributions to poverty studies. The theory has had influence on some of the conceptualisations of poverty that emerged in the recent past. The concepts of social exclusion, relative deprivation, and capabilities, for example, are all founded on the tenets of the theory of justice as fairness (Atkinson, 1987; Brady, 2003a, 2003b; Sen, 1983, 1992). Moreover, the founding principles of the theory—that is, the fair value of liberties and the difference principle—are concerned with the plight of the poor and socially excluded group in a population (Atkinson, 1987; Brady,

2003a, 2003b. Rawls (1971, p. 98) suggests that this group can be identified as "the people with less than half of the median income and wealth."

2.2. Definitions

Definitions of poverty provide precise statements of what differentiates the state of poverty from that of not being poor (Hagenaars and de Vos, 1988; Lister, 2004; Triest, 1998). These statements guide the choice of measures used in determining the level of poverty in a population and consequently translate conceptualizations of poverty into policy initiatives. There is no single definition of poverty that transcends all societies. However, it is important that each definition used relates to the conditions of the society to which it is applied (Lanjouw, 1997; Lister, 2004; Osberg, 2000).

Definitions of poverty fall into three main categories (Hagenaars and de Vos, 1988). (1) Poverty can be defined as having less than an objectively established absolute minimum. (2) The phenomenon could also be defined as having less than others in society (relative poverty), and (3) it could also be defined based individual households'/persons' preferences or utilities (subjective poverty). Poverty research has traditionally been dominated by the first two definitions. This is mainly because of the difficulties in aggregating multiple individual tastes across a population (Lok-Dessalien, 2000). In its simplest description, absolute poverty means that households or individuals cannot meet basic needs (Sachs, 2005). In other words, absolute poverty denotes a lack of access to resources, productive assets, and income, leading to a state of material deprivation (Cagatay, 1998). Relative poverty, on the other hand, does not only consider the lack of minimum subsistence means but also takes into account inequality in society (Leatt, 2006). It compares the lowest segments of the population with upper segments usually measured in income percentiles (Lanjouw, 1997; Lok-Dessalien, 2000).

Poverty definitions do not just differ by the absolute-relative classification; they also differ in scope. This, in practice, leads to an overlap between concepts and definitions (Lister, 2004).

2.3. Conceptualizations

Conceptualizations provide the framework in which definitions and measurements are developed; shed light on what poverty means—both to those who are directly affected and to different groups in society; and also play a critical role in the formulation of poverty alleviation strategies (Beard, 1999; Lister, 2004; Lok-Dessalien, 2000; Williamson and Reutter, 1999; World Bank, 2001a). Different competing conceptualizations of poverty have been developed. These include differentiation between chronic and transitory poverty, exclusion and vulnerability, and the notion of capabilities poverty. Detailed discussions of these concepts can be found in Chronic Poverty

Research Center (2004), Hulme and Shepherd (2003), Mehta and Shah (2003), May (2003), Aliber (2003), World Bank (2001a, 2001b), Mckay and Lawson (2003), Osmani (2003), Franco (2003), Brady (2003a), Aliber (2001), Jalan and Ravallion (2000), Lok-Dessalien (2000), May (2000), and Beard (1999).

2.4. Measures

Measures of poverty provide a platform to operationalize the definitions so that those defined as poor in a given population can be counted to determine the prevalence of poverty in that population (Boltvinik, 1998; Lister, 2004). Generally, there are two methodologies applied in poverty measurement (Boltvinik, 1998). These are (1) unidimensional methods and (2) multidimensional methods.

However, regardless of the methodology adopted, poverty measurement involves three important steps (Chaubey, 1995; Ravallion, 1992, 1998; Ruggles, 1990; World Bank, 2005), namely (1) determination of the relevant indicator of welfare,[2] (2) establishing the poverty line,[3] and (3) generating an index that aggregates the information from the chosen welfare indicator.[4]

There are four principal measures of poverty. These are (1) the *head-count index*, which simply measures the proportion of the population that falls below the poverty line—hence, the proportion that is counted as poor; (2) the *poverty gap index*, which measures the depth of poverty with no reference to the spread of poverty and the degree of inequality among the poor; (3) *the squared poverty gap index*, which measures the severity of poverty by taking into account the distance from the poverty line and the degree of inequality among the poor; and (4) *the Gini coefficient*.

As shown in the preceding paragraph, the traditional measures of poverty have fundamental limitations. We do not describe them here; they can be found elsewhere in literature (e.g. Blackwood and Lynch, 1994; Myles and Picot, 2000). It suffices to mention that the weaknesses of the measures have led to the development of axiomatic indexes of poverty. The prominent indexes in this class of poverty measures include Sen's (1976) index and the Foster, Greer, and Thorbecke or FGT (1984) index. It is worth noting that although the indexes reviewed are widely used when well-being is measured by income, they can be computed for any measure of well-being, albeit with increased risk of running into the difficulty of interpreting the results. Also, although the axiomatic indexes of poverty address the major limitations of the traditional measures, they have thus far failed to oust the traditional measures from the mainstream analyses of poverty. In particular, the head count measure continues to dominate poverty studies in both the developed and less developed regions of the world. Several studies (e.g. Brady, 2003a; Myles and Picot, 2000) attribute the continued use of the head count ratio despite its well-published limitations to the fact that (1) the new methods are mathematically complex and not easy to interpret

and (2) despite its shortcomings, the head-count index possesses theoretically desirable properties. A detailed discussion of these properties can be found in Chaubey (1995).

2.5. Poverty Studies in South Africa

Poverty research has a long history in South Africa, and the history generally reflects the context within which the research was conducted (Wilson, 1996). For instance, due to the apartheid policies, most of the socioeconomic data collected prior to the 1990s only permitted poverty studies that focused on the White population of the country (Pillay, 1996; Tjønneland, 1996; Wilson, 1996). However, the situation changed in the mid-1990s when regular collection of nationally representative data was started.

The national datasets that are publicly available and could be used to study poverty in South Africa in the period 1996 to 2007 include (1) the October Household Survey (OHS), which was run annually between 1994 and 1999; (2) the General Household Survey (GHS), which has been conducted annually since 2002 to fill the gap left by the discontinuation of the OHS; (3) the Income and Expenditure Survey (IES), which has been conducted every five years since 1995; (4) the Labour Force Survey (LFS), which is a biannual survey that has been run since 2000; (5) the 1996 and 2001 population censuses; and (6) the 2007 Community Survey (CS).[5]

A review of poverty studies that utilized the aforementioned data sources shows that although inference is often made about patterns in variables that form the core of individualistic or cultural explanations of poverty (e.g. female headship), poverty research in South Africa is dominated by structural explanations. Apartheid policies and other structural forces such as high unemployment and disparities between rural and urban areas are often cited as the causes of the poverty patterns that are observed in the country (see, for example, Harsch, 2001; MacDevett et al., 2005; May, 2000). Also, most of the literature on poverty in the country adopts the narrow conceptualization of the phenomenon and measures it based on income or expenditure data. The literature further shows that most studies focus on the head count index to measure poverty in the country. Few studies (e.g. Hoogeveen and Özler, 2006; Ngwane et. al, 2001), however, do consider the depth of poverty in the country and apply the FGT class of poverty measures as part of the broader analysis.

Additionally, there is no national consensus on the appropriate poverty line for South Africa.[6] As a result, researchers employ different strategies in measuring poverty in the country. Various estimates suggest that the absolute numbers of people classified as income poor increased between 1996 and 2007. For instance, Meth and Dias (2004) found that individuals that fell into the bottom two expenditure categories (ZAR0–ZAR399 and ZAR400–ZAR799) increased, respectively, by 2.9 million (or 31%) and 1.4 million (or 11%) in the period 1999 to 2001. This conclusion is supported

by Hoogeveen and Özler (2006), who show that the head count index of the poor increased nationally from 32% in 1995 to 34% in 2000 using the 1995 and 2000 IES with the poverty line set at $2 per person per day.

Other general findings obtained from the recent poverty analysis of South Africa show that poverty is highest among Black Africans, female-headed households, rural populations, and children. Also, poverty levels differ significantly by province in South Africa. Gauteng and the Western Cape are shown to have lower levels of poverty, whilst Eastern Cape and Limpopo are shown to be experiencing the worst poverty levels.

3. CONCEPTUAL FRAMEWORK, DATA, AND METHODS

3.1. Conceptual Framework

The chapter computes an index that is a mix of the absolutist, the relativist, and the capabilities notions of poverty. It captures the absolutist concept in that the variables included in the computation are dichotomized in a manner such that the minimum acceptable levels could be identified. For example, one can ascertain whether a household has access to piped/safe drinking water or not. The relativist concept of poverty is captured by employing the Rawlsian poverty line (½ the median score of the index). Last, by including indicators of household human capital in its computation, the index captures the capabilities concept of poverty.

This study measures poverty at household level.[7] All persons that belong to a given household are assumed to "enjoy" or "endure" similar socioeconomic circumstances. Some studies—for example, Glewwe and van der Gaag (1988)—have criticized this assumption on the basis that it ignores the important question of the intrahousehold distribution of consumption. However, the index as used in the study makes this question of intrahousehold distribution untenable. It is not conceivable, for example, that certain members in a household can enjoy more light from an electric bulb than other members of the same household.

3.2. Data

The chapter employs a *pooled dataset* comprising 30% microdata samples from the 1996 and 2001 censuses and the 2007 CS to answer the research questions asked in the introduction. The three datasets are cross-sectional samples of the population of South Africa at different points in time. In order to generate poverty estimates that are comparable over time, the study computes the poverty line from the pooled data. This approach controls for the cross-dataset differences in the distribution of the variables used that are attributable to the cross-sectional nature of the samples.

3.3. Methods

The chapter follows a two-step procedure in identifying the poor. First, the statistical method of principal components analysis[8] is used to compute a composite index—ACI—using information on eight types of household assets/characteristics and two measures of household functional capabilities. The household assets/characteristics data used in computing the index include (1) type of main dwelling for the household (modern, traditional/informal, other/caravan/tent); (2) ownership of telephone; (3) source of energy for cooking (electricity/gas, paraffin, wood/coal/animal dung/other); (4) source of energy for heating (electricity/gas, paraffin, wood/coal/animal dung/other); (5) source of energy for lighting (electricity/gas, paraffin, candles/other); (6) main source of domestic water supply (piped water inside, piped water outside, public tap, other source); (7) type of toilet facility (flush and chemical, pit latrine and bucket, no toilet or other, e.g. open land), and (8) means of refuse disposal (local authority/private company, communal/own dump, no refuse disposal facility). The capabilities dimension is captured by including (1) the proportion of adults that have high school education and above in each household and (2) the proportion of employed adults in each household. In total, the aforementioned sets of data yield twenty-five variables (twenty-three binary and two continuous) that are used in the principal components analysis.

The results of the principal components analysis (not presented here) show that all the variables included in the ACI for South Africa are in the expected direction. The variables that are indicative of higher household socioeconomic status (SES)—for example, having piped water inside the dwelling, using electricity/gas for heating, having a flush toilet, and the like—have bigger (and positive) scoring factors than those that are perceived to measure lower levels of SES (see appendix for further details on the interpretation of the scoring factors). The summary statistics, on the other hand, show a general improvement in the living conditions for South African households.

The second step in identifying the poor involves calculating a *poverty line*. As mentioned earlier, the study applies a Rawlsian approach and sets the poverty line at ½ the median score of the index. Thus, households that fall below ½ the median scoring factor of the ACI calculated from the pooled data are defined as poor and the rest are classified as nonpoor.

3.3.1. Mapping and the Statistical Analysis of the Observed Poverty Patterns

After identifying the poor households, the study produces maps to determine the spatial distribution of ACP in South Africa. This analysis is performed for the provinces, district municipalities, and local municipalities of the country. However, simple maps of the estimated magnitude of poverty

at local levels may be deceiving because the patterns of clustering in certain parts of the country could happen by chance alone or could simply be of no public policy importance (Wang, 2006). In order for the study to make conclusive statements about the observed patterns, it first performs spatial cluster analysis to determine the statistical significance of the clustering or nonrandomness of the distribution of poverty in space.

3.3.2. Spatial Cluster Analysis of ACP in South Africa

This study uses the polygon and queen contiguity approaches to identify adjacent municipalities and define neighbourhoods (see Anselin, 2003, and Wang, 2006, for details on these concepts).

Furthermore, the study conducts both global (national) and local-level assessments of the observed spatial patterns of ACP data checks for spatial autocorrelation. The global tests provide a summary picture about the structure of the data, while the local tests, on the other hand, detect pockets or clusters of similarities/differences in the distribution of the values of given variables by space.

Several measures have been developed to evaluate data for global spatial clustering (Anselin et al., 2000; Getis, 2005; Longley et al., 2005). This study uses the Moran's I. This index functions like the Pearson correlation coefficient (Anselin et al., 2000; Lorant et al., 2001), and its values range from –1 (strong negative spatial autocorrelation) to +1 (strong positive spatial autocorrelation). Accordingly, a Moran's I value of 0 indicates absence of spatial autocorrelation.

The most commonly used statistical measure of local spatial clustering of a given attribute, and one that is used in this study, is the local indicator of spatial association (LISA). This index measures the association of an attribute value at a given location, with the values of that attribute observed in neighbouring locations. LISA statistics are interpreted as follows: (1) a positive I_i means either a high value is surrounded by high values (high-high) or a low value is surrounded by low values (low-low). (2) A negative score means either a high value is surrounded by low values (high-low) or vice versa (low-high).

3.3.3. Characteristics of the Poor

After determining the spatial distribution of ACP, this study examines the attributes of the poor households. It achieves this using simple cross-tabulations and binary logistic regression models for the probability that a given household is classified as assets and capabilities poor based on the aforementioned poverty line.

The dependent variable in the logistic regression models is the logit of household poverty (where probability that household (i) is classified as poor in year T [1996, 2001, or 2007] is specified as pTi); and the explanatory variables include the sex of the head of household, rural/urban residence, province, age of household head, and dummy variables for ownership of dwelling unit and crowding.

4. RESULTS

4.1. Levels and Trend of Household Assets and Capabilities Poverty (ACP) in South Africa, 1996 to 2007

Figure 13.1 shows the cumulative distribution functions (CDFs) for the assets and capabilities index (ACI) for South Africa in 1996, 2001, and 2007. The dotted vertical line represents the poverty line (ACI = 0.156), calculated as ½ the median index score from the pooled dataset used in the analysis. The vertical axis shows the proportion of households with index scores less than or equal to the corresponding value on the horizontal axis. Accordingly, the points where the CDFs meet with the poverty line show the proportions of households that are classified as assets and capabilities poor in the years to which the CDFs pertain. The graph shows that South Africa was characterized by huge but declining levels of inequality in living standards during the period 1996 to 2007. About half of the country's households (49.1%) were assets and capabilities poor (lacked some or all of the basic needs and were to some extent ill equipped to function properly) in 1996, and this proportion dropped to 45.1% and 38.2% in 2001 and 2007, respectively.

Figure 13.1 also provides a picture about the trajectory that characterized the observed decline in ACP levels during the period under study. Although the CDFs cannot be used to make complete rankings of the aggregate levels of living standards during the period under study (because they converge and even cross each other at the higher values of the ACI), a conclusion can be made that the living conditions of the poor improved

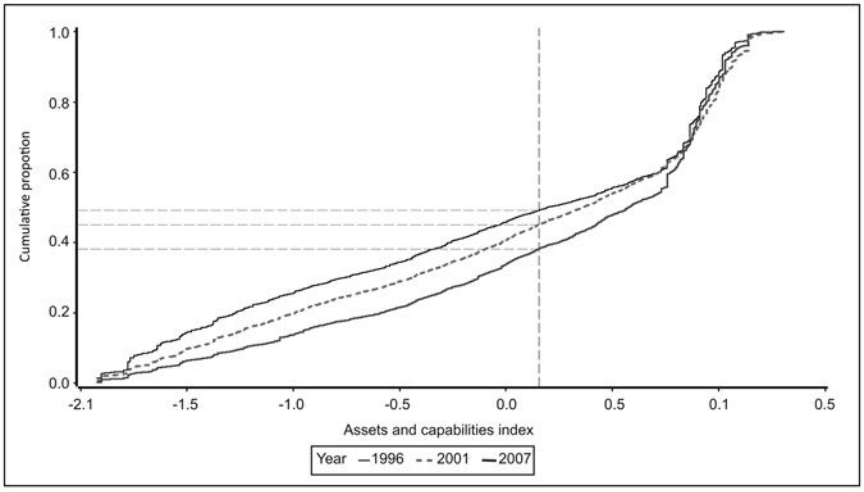

Figure 13.1 Cumulative distribution functions (CDFs) of assets and capabilities index (ACI) in South Africa, 1996–2007

between 1996 and 2007. This point is illustrated in that the CDFs for the years 2001 and 2007 lie below the CDF for 1996 for all points below the poverty line.

The national estimates, however, conceal the vast spatial differences in the prevalence of poverty at the lower levels of geography in the country. Table 13.1 shows the proportions of assets and capabilities–poor households by province in 1996, 2001, and 2007. The table shows that Limpopo, Eastern Cape, and Mpumalanga provinces are the most impoverished in the country. The situation is worse for Limpopo and the Eastern Cape, where throughout the period 1996 to 2007, more than six in every ten households were classified poor. The Western Cape and Gauteng provinces, on the other hand, are the wealthiest. The proportion of poor households in the two provinces averaged 11% and 19%, respectively, between 1996 and 2007.

Table 13.2 shows variations in the shares of poor households across provinces. These provincial poverty shares provide crucial information that could be used to guide targeted interventions. The data show that whilst Limpopo was estimated to be the province with the highest proportions of assets and capabilities–poor households throughout the period 1996 to 2007, the provincial poverty shares are shown to be proportionately higher for the most populous provinces, particularly KwaZulu-Natal (above 20% on average). Table 13.2 also shows a general decline in the share of poor households in Gauteng and the Western Cape over time.

Table 13.1 Levels and trend in percentage distribution of assets and capabilities poor households by province, 1996–2007

Province	**1996**	**2001**	**2007**
Western Cape	13.7	11.7	6.3
Eastern Cape	64.7	61.0	58.3
Northern Cape	45.4	41.0	27.5
Free State	47.7	45.9	27.2
KwaZulu-Natal	57.3	53.3	48.2
North West	65.1	58.2	44.6
Gauteng	21.7	19.5	14.5
Mpumalanga	71.6	68.4	60.1
Limpopo	86.0	81.7	79.5
Grand Total	**49.1**	**45.1**	**38.2**

Source: Author's calculations

Table 13.2 Provincial shares (%) of households that are assets and capabilities poor, 1996–2007

Province	1996	2001	2007
Western Cape	3.0	2.7	1.8
Eastern Cape	19.3	17.8	19.4
Northern Cape	2.2	2.0	1.5
Free State	6.9	6.7	4.6
KwaZulu-Natal	21.6	22.4	22.5
North West	9.1	9.4	8.5
Gauteng	9.9	10.7	9.6
Mpumalanga	10.5	10.6	11.8
Limpopo	17.4	17.8	20.2
Grand Total	**100.0**	**100.0**	**100.0**

Source: Author's calculations

4.2. Spatial Distribution of Household Assets and Capabilities Poverty (ACP)

The maps in Figures 13.2 and 13.3 show the percentage distribution of households that were assets and capabilities poor at district and local municipality levels in 1996 and 2007.[9] The data presented in the maps make clear the findings made above that (1) the overall inequality in living standards decreased between 1996 and 2007, as shown in the increase in the number of district and local municipalities that have less than 20% of their households classified as poor in 2007 compare to 1996; and (2) that although the Limpopo province is the poorest, a large proportion of poor households is accounted for by the most populous provinces of South Africa. Figure 13.3, for example, shows that extremely impoverished local municipalities (municipalities with more that 80% of their households classified poor) were widely spread in the provinces of KwaZulu-Natal and Eastern Cape in both 1996 and 2007.

The poorest district in 1996 was Alfred Nzo (Eastern Cape), with 96% of its households classified as ACP, while the wealthiest district was Nelson Mandela Bay Metropolitan Municipality (8%), also from Eastern Cape. Local municipality rankings show that Imbabazane municipality (KwaZulu-Natal) was the poorest (more than 99% households classified poor), while Overberg DMA (Western Cape) was the least poor (0% households classified poor).

The data for 2007 show that while the City of Cape Town Metropolitan was the wealthiest district, with less than 5% of its households classified

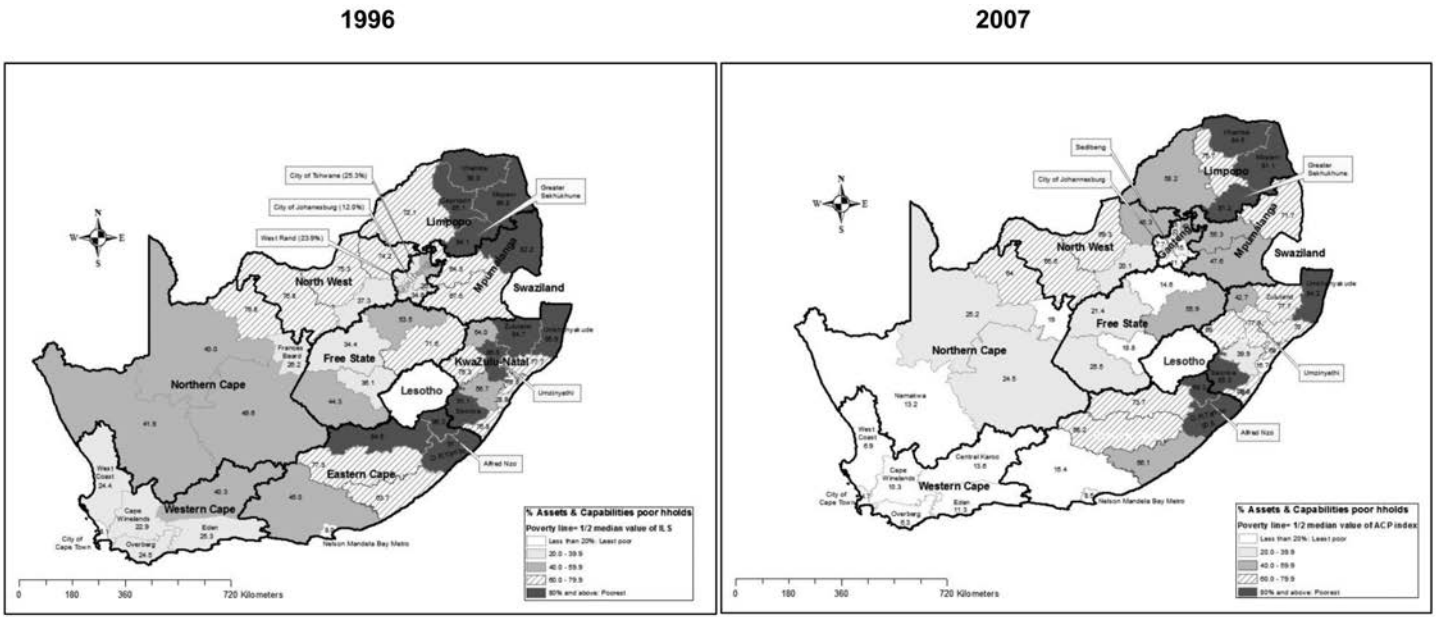

Figure 13.2 Maps showing the proportion (%) of assets and capabilities poor households by district municipality, South Africa, 1996 and 2007

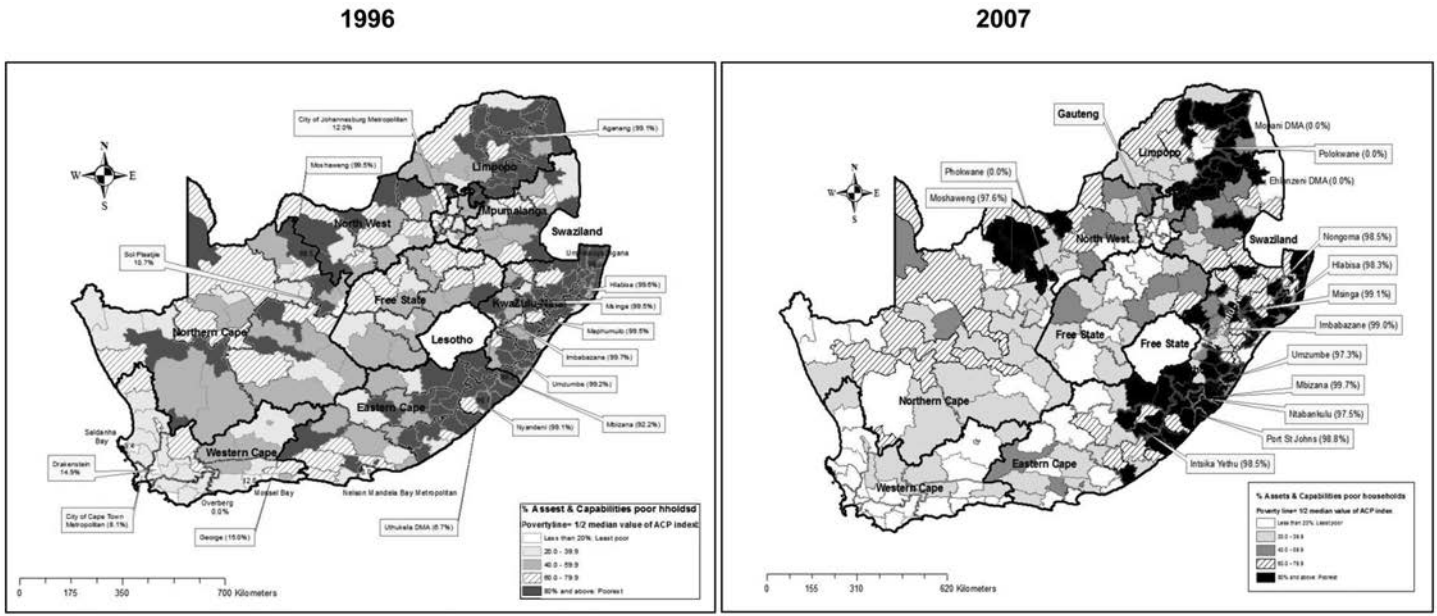

Figure 13.3 Maps showing the proportions (%) of assets and capabilities poor households by local municipality, South Africa, 1996 and 2007

as poor, the Greater Sekhukhune district (Limpopo) was the poorest, with nine in every ten of its households classified as poor. With regards to local municipalities, the data show that Polokwane municipality in Limpopo (0%) was the wealthiest while Mbizana in the Eastern Cape (99.7%) was the poorest.

Figures 13.2 and 13.3 also highlight the bottom ten and top ten districts and local municipalities in 1996 and 2007, respectively. The data show that the bottom ten poorest districts in 1996 comprised: the Alfred Nzo district, Eastern Cape (96.3%); Umkhanyakude district, KwaZulu-Natal (95.9%); Greater Sekhukhune district, Limpopo (94.1%); O.R. Tambo district, Eastern Cape (91.7%); Sisonke district, KwaZulu-Natal (91.1%); Vhembe and Mopani districts, Limpopo (90.0% and 86.8%, respectively); Umzinyathi district, KwaZulu-Natal (86.8%); Capricon district, Limpopo (85.1%) and Zululand district, KwaZulu-Natal (80.6%). The top ten wealthiest districts in 1996 comprised: the Nelson Mandela Bay Metro (8%); City of Cape Town Metro (8.1%); City of Johannesburg Metro (12%); Cape Wine lands, Western Cape (22.9%); West Rand, Gauteng (23.9%); West Coast, Overberg and Eden districts (all from Western Cape, 24.4%, 24.5%, and 25.3% respectively); City of Tshwane Metro, Gauteng (25.3%), and Frances Baard, Free state, (26.2%).

With regards to local municipalities, the 1996 census shows that ACP was highest in Imbabazane municipality, KwaZulu-Natal (with 99.7% households classified as poor), and lowest in Overberg DMA, Western Cape (0% households). The full complement of the bottom ten (poorest) municipalities included Imbabazane municipality; Hlabisa, KwaZulu-Natal (99.6%); Moshaweng, Northern Cape (99.5%); Maphumulo, Msinga, Umhlabuyalingana, Umzumbe municipalities (all from KwaZulu-Natal, with proportions of poor households ranging from 99.5%, to 99.2%); Nyandeni, Eastern Cape (99.1%); and Aganang, Eastern Cape (99.1%). The group comprising the top ten wealthiest local municipalities, on the other hand, included the major metropolitan areas (City of Cape Town, City of Johannesburg and Nelson Mandela Bay).

The data for 2007 show that the district and local municipalities that constitute the bottom ten and top ten categories did not change much between 1996 and 2007. Generally, DMAs, districts, and local municipalities that encompass metropolitan areas and major cities were found to be wealthier than predominantly rural municipalities and districts.

4.3. Results of Analysis of Spatial Clustering of Assets and Capabilities Poverty (ACP) in South Africa

The importance of statistical analysis of the patterns of poverty distribution shown in Figures 13.2 and 13.3 was highlighted earlier and cannot be overemphasized. Figures 13.4 and 13.5 show the results of this analysis in

the form of LISA cluster maps and the Moran's I statistics for ACP at district and local municipality levels of South Africa in 1996 and 2007.

Figure 13.4 shows that there is a strong positive clustering of households by ACP status at district level in the country. The Moran's I scores were 0.605 and 0.670 ($p < 0.05$) in 1996 and 2007, respectively. In both years, high-poverty districts (high-high) were clustered in Limpopo, KwaZulu-Natal, and Eastern Cape, while low-poverty districts (low-low) were almost exclusively clustered in Western Cape and Gauteng.

The analysis at local municipality level (Figure 13.5) shows weak positive clustering of households by poverty status in 1996 (Moran's I score = 0.409; $p < 0.05$) and a rather strong positive clustering in 2007—Moran's I score = 0.509 ($p < 0.05$). Nevertheless, as is the case with the analysis at district level, the local municipality level analysis also shows that high-poverty municipalities were clustered in Limpopo, KwaZulu-Natal, and Eastern Cape during the period 1996 to 2001. Additionally, Figure 13.5 shows that low-poverty municipalities were clustered in Western Cape and Gauteng and around major cities and towns in other provinces in 1996 and 2001. Another noticeable feature shown in the graph is that in 2007, there was more pronounced clustering of low-poverty municipalities in the central parts of the country than was the case in 1996.

To sum up, the discrepancies in the magnitude of clustering of households by poverty status (Moran's I statistics) when one switches from district to local municipality levels of analysis is worth noting. These differences present a classical example of the concept called the modifiable areal unit problem (MAUP), which says variation in the spatial units used for aggregation causes variation in statistical results. It is, however, also worth noting that despite the discrepancies, both levels of analysis point to an increasing pattern of household clustering by poverty status between 1996 and 2007.

4.4. Characteristics of the Poor

The preceding analyses provided a picture about the levels, trend, and spatial distribution of assets and capabilities–poor households in South Africa during the period 1996 to 2007. But what are defining characteristics of these households? The answer to this question is the object of this subsection.

Table 13.3 summarizes the profile of assets and capabilities–poor households using results from binary logistic regression models of the probability that a household was poor in 1996, 2001, and 2007, after controlling for household-level demographic, socioeconomic, and geographic variables. Before discussing the results, is it important to note that the fitted models do not imply causality, they only show the cross-sectional associations between a given household's poverty status and the covariates that were included in the models.

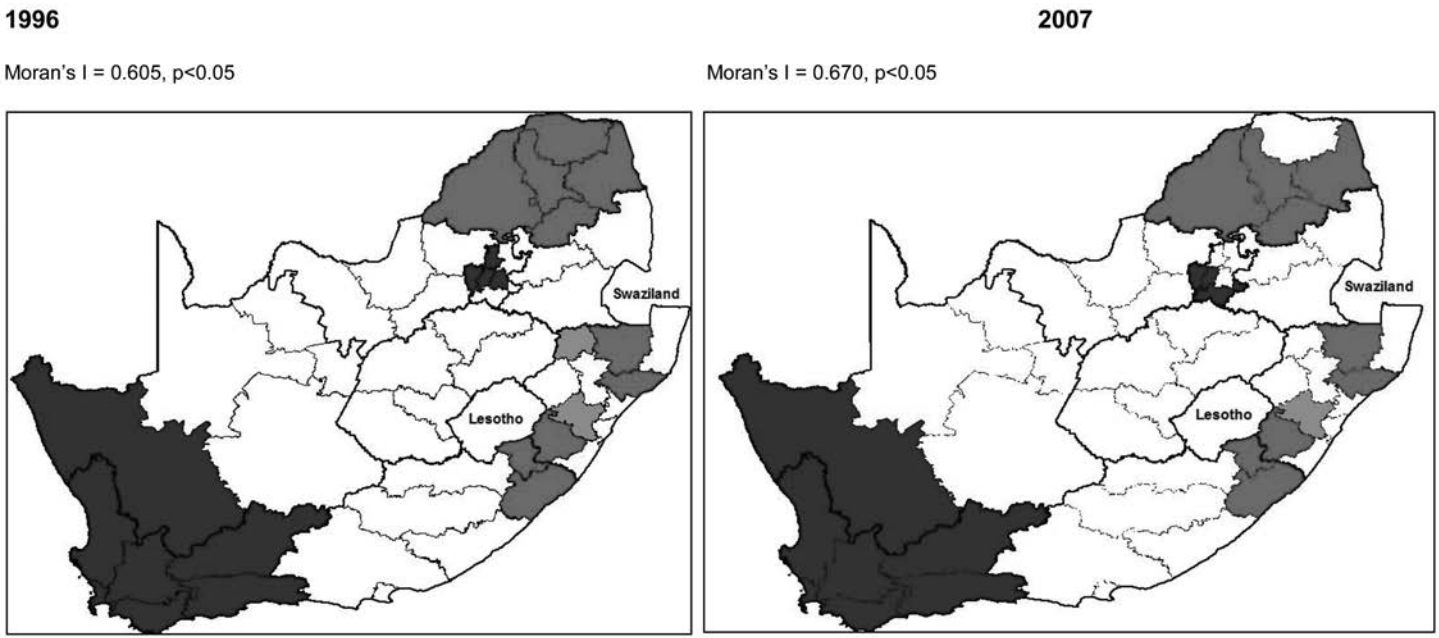

Figure 13.4 LISA cluster map for assets and capabilities poverty by district municipality, South Africa, 1996 and 2007

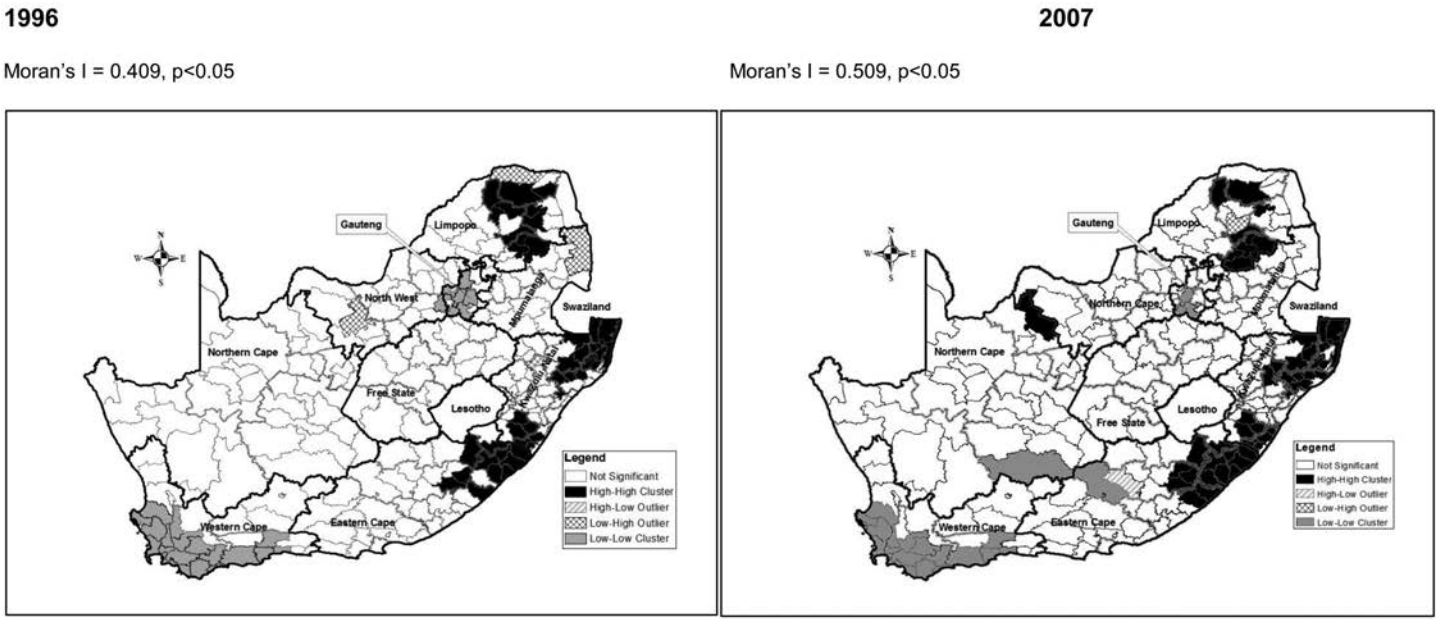

Figure 13.5 LISA cluster maps for assets and capabilities poverty by local municipality, South Africa, 1996 and 2007

Table 13.3 Odds ratios from logistic regression models of household poverty status on selected variables, 1996–2007

Variable	Census '96	Census '01	CS 2007
Province			
Western Cape (ref)	1.000	1.000	1.000
Eastern Cape	1.545**	2.111**	4.445**
Northern Cape	2.116**	1.760**	3.844**
Free State	2.363**	2.895**	3.207**
KwaZulu-Natal	2.506**	2.263**	3.575**
North West	2.049**	1.984**	1.761**
Gauteng	1.412**	1.542**	2.362**
Mpumalanga	3.066**	4.260**	5.185**
Limpopo	2.059**	3.784**	4.527**
Population group			
White (ref)	1.000	1.000	1.000
African	50.415**	164.995**	24.349**
Coloured	14.789**	29.965**	9.754**
Indian	1.229**	2.285**	1.299**
Place of residence			
Rural (ref)	1.000	1.000	1.000
Urban	0.019**	0.068	0.036**
Age of household head			
10–24 years	1.572**	1.234**	1.294**
25–55 years (ref)	1.000	1.000	1.000
56 years and above	1.119**	1.460**	1.294**
Sex of household head			
Female (ref)	1.000	1.000	1.000
Male	0.925**	0.927**	0.923**
Tenure of hhold dwelling			
Rented (ref)	1.000	1.000	1.000
Owned (fully/partially paid)	2.866**	0.664**	0.843**
Household crowding[10]			
Crowded (ref)	1.000	1.000	1.000
Not crowded	0.435**	0.656**	0.589**
N	2,385,068	2,689,635	246,618
–2 Log likelihood	1,473,234	2,123,605	179,349

Notes: $**p < 0.001$ ref = reference (omitted category)
Source: Author's calculations

Overall, the results confirm the conclusions drawn from income/expenditure-based studies of poverty with regard to differentials by place of residence, age, and sex of household head and race in South Africa. For instance, Table 13.3 shows that after controlling for all the covariates included in the models, African households emerge as the poorest in the country. In the 1996 census model, African households were 50 times more likely (odds ratio = 50.4, $p < 0.001$) to be assets and capabilities poor compared to White households (reference group). By the time of CS 2007, the gap between African households and White households had decreased considerably, but still African households were about 24 times more likely to be classified poor compared to White ones. Coloured households are the second poorest in the country. The likelihood for Coloured households to fall into the poor category was estimated at about 15, 30 and 10 times above the likelihood for White households in 1996, 2001, and 2007, respectively. Lastly, the odds ratios show that Indian households are the closest to White households in living standards. In 1996 and 2007, respectively, Indian households were about 20% and 30% more likely (odds ratios = 1.2 and 1.3; $p < 0.001$) to be classified assets poor compared to White households.

Furthermore, Table 13.3 shows that urban households are more than 90% less likely to be asset and capabilities poor compared to their rural counterparts, and the results are highly significant. The odds ratios for the likelihood of an urban household to be classified poor, relative to a rural household, were 0.019, 0.068, and 0.036 in 1996, 2001, and 2007 respectively. Male-headed households are less likely than their female-headed counterparts to be poor. Additionally, the data show a strong association between the age of household head and poverty status of households. Households that are headed by young people (ages 10–24 years) and those headed by elderly people (ages 56 years and above) are more likely to be poor compared to those headed by people in peak economically productive ages (25–55 years).

Table 13.3 further shows interesting results with regards to household crowding and ownership of dwelling units. The data show an inconclusive picture about the relationship between the tenure status of dwelling units and poverty status of households. The 2001 and 2007 data show that households that owned their dwelling units (partially or fully paid) were less likely to be assets and capabilities poor compared to households that rented their dwellings, whereas the 1996 data show the opposite.

Finally, the data in Table 13.3 show that crowded households tend to be poorer than households that are not crowded.

4.5. Trend in Living Conditions by Poverty Status (1996 to 2007)

This section assesses the trend in the life circumstances of households, by poverty status, looking at all indicators of well-being that were included in the calculation of the assets and capabilities index.

The study shows a huge increase in the proportion of assets and capabilities–poor households that had access to electricity/gas during the period 1996 to 2007 (from about 25% in 1996 to 55% in 2007). As mentioned earlier, there is little change in the corresponding proportions for nonpoor households, with an average of more than 80% of them using electricity for either cooking, lighting, or heating in the same period. The data, however, suggest that poor households use electricity or gas more for lighting than for cooking and heating.[11] This pattern is perhaps a result of cost considerations, as it is more affordable for the poor households, which experience high levels of unemployment and therefore limited income, to use electricity for lighting only because light bulbs consume far less energy compared to cooking and heating appliances such as stoves, microwaves, and heaters. The proportion of poor households that used electricity/gas for cooking ranged from 12.8% in 1996 to 28.3% in 2007, whereas an average of only 13.7% of the households used the two sources of energy for heating in the same period.

The data also show impressive increases in the proportion of poor households that have access to telecommunications, from 2.4% in 1996 to 62.1% in 2007, whereas the corresponding change in the proportion of nonpoor households that have access to telecommunications was less pronounced, increasing from 55.5% in 1996 to 84.3% in 2007.

With regards to adult household employment ratios, the data show stable levels with an average of one employed adult in every four adults (0.245) among poor households and an average of one employed adult in every two adults (0.521) among nonpoor households during the study period.

Other important trends in the life circumstances of the poor versus the nonpoor relate to access to safe (piped) water and sanitation. The percentage of poor households that have access to piped water increased from about 60% in 1996 to about 66% in 2007. Although these results show a desirable trend, it is worth noting that a little more than one third of South Africa's poor households (and about 20% of all households in the country) remained exposed to unsafe drinking water in the dawn of the second decade of democratic South Africa. Equally important, the results also highlight huge inequalities in access to safe water, because throughout the study period, an overwhelming average of about 99% of the nonpoor households enjoyed access to piped water.

Lastly, poor sanitation is a major problem for poor households, and this pattern seems to be tied with the lack of access to piped water among these households. About 73% of assets and capabilities poor households used pit latrines and buckets as their main toilet facility in 2007. One in every five poor households (21.5%) did not have a toilet at all, showing a slight improvement from the proportion (25.0%) that was observed in 1996. Although the trend in the percentage of households that lack toilet facilities is in the desired direction, the observed levels are a cause for concern for the country's general health policy and show that a lot still needs to be done before ACP could be eradicated in South Africa.

5. SUMMARY AND CONCLUSIONS

Contrary to the common practice of using income or expenditure data to measure and study patterns of poverty in a population, the present study conceptualizes poverty as a multidimensional phenomenon that can be measured through the socioeconomic variables that are commonly collected in censuses and household surveys. It uses a pooled dataset comprising the 2007 Community Survey and the 1996 and 2001 censuses of South Africa. Accordingly, it uses the statistical method of principal components analysis to create a composite index of household assets and capabilities data to examine levels and trends of poverty for provinces, DCs, and local municipalities of South Africa during the period 1996 to 2007.

Specifically, the study answers the following questions: (1) What has been the trend in ACP levels in South Africa between 1996 and 2007? (2) How are the poor geographically distributed in the country? (3) What are the defining characteristics of the poor in South Africa?

In answering these questions, the study first reviewed literature on poverty measurement practices in South Africa, examining how the methods and conceptualizations used fit with the country's current antipoverty policies and strategies. The review showed that most poverty studies in South Africa adopt a narrow approach to the conceptualization and measurement of poverty. In most cases, income/expenditure data are used (e.g. Hoogeveen & Özler, 2006; Leibbrandt et al., 2006; Meth & Dias, 2004; Ngwane et al., 2001; Statistics South Africa, 2000; World Bank, 1995). Accordingly, the country's antipoverty strategy is influenced by income/expenditure-based poverty research. While one cannot dispute the importance of the income/expenditure data in the study of poverty. It is, however, worth noting that these data potentially underestimate poverty because they do not account for some of the most important dimensions of household living conditions.

One of the main conclusions drawn from the literature is that there is no national consensus on the appropriate poverty line for South Africa. As a result, different researchers employ different strategies in measuring poverty in the country. The assets and capabilities index developed in this study is, however, *not* directly comparable with the income/expenditure measures of poverty because it ranks the relative SES of households based on a wide variety of indicators of living conditions. Furthermore, it is not intended to be a replacement for the income and expenditure measures of poverty. Rather, it is a complement to these data. Importantly, since the index is derived from variables that are collected with fairly good accuracy in both surveys and censuses, it makes it possible to provide poverty estimates for small areas, a thing that is not always possible with income and expenditure data.

However, it is acknowledged in the study that the variables included in the assets and capabilities index are not comprehensive enough. Other important dimensions such as health, safety, and security were not included because they were not collected by the data sources that are used in the study.

The analysis showed that the index developed in this study is robust and consistent when calculated from data that measure the same dimensions of living standards over time. Overall, the estimates of household poverty show that an average of 44.1% of South African households were assets and capabilities poor in the eleven-year period between 1996 and 2007. This estimate is much higher than income- and expenditure-based estimates. For example, using different income/expenditure poverty lines, different researchers estimate household poverty in the range of 11% (Ngwane et al., 2001) to 29% (Statistics South Africa 2000) in 1996. Both studies used the 1995 income and expenditure survey and 1996 census data. Earlier studies based on the Project for Statistics on Living Standards and Development (PSLSD) (e.g. May, Woolard, and Klassen, 2000) estimated the household poverty rate at 35% in 1993.

Despite showing huge differences in the estimates of poverty levels compared to the income/expenditure-based measures, the index used in this study shows a similar conclusion with regard to inequality in South Africa. By virtue of the poverty line used, about 25% of the households are expected to be poor if the assets and capabilities were equally distributed. The finding that more than 40% are classified poor indicates huge inequality in living standards in the country. A similar conclusion has been made with income/expenditure based research (e.g. May, Woolard, and Klassen, 2000; Statistics South Africa, 2000; World Bank, 2001a), which reports high Gini coefficients for South African income distribution, indicating high income inequality in the country.

Additionally, the results also show that the profile of assets and capabilities–poor households resembles that of income/expenditure poverty in South Africa. African and Coloured households are more likely than Indian and White households to be assets and capabilities poor. The same is true for rural households, which are shown to suffer more asset deprivations compared to their urban counterparts. The data also show that female-headed households are more likely to be poor than male-headed ones. Most of these differences in poverty experiences among the different groups discussed could be traced back to the apartheid policies that plagued South Africa for most of the twentieth century.

The results of this study further indicate that although relative ACP levels are high in South Africa, there has been a moderate improvement over time. The national poverty levels declined by about 11 percentage points from 49.1% in 1996 to 38.2% in 2007. The decline in the levels resulted from a huge increase in the proportion of households that use electricity/gas for lighting, heating, and cooking, increase in the proportion of households that own a home phone or cell phone, and an increase in the proportion of households that have proper sanitation. Most of these improvements may be attributable to RDP delivery.

The results, however, show that there is still a long way to go before the country's developmental goals, as articulated in the RDP and MDGs, for

example, will be met. Poverty has not been eradicated from the country. In particular, the results show huge differences in poverty levels and, hence, living standards by province, district municipality, and local municipality. The provinces of Limpopo and Eastern Cape are shown to be highly impoverished, with more than 60% of households in each of these provinces classified as assets and capabilities poor. Gauteng and the Western Cape, on the other end of the spectrum, are the wealthiest provinces, with fewer than 20% of their households classified as poor.

Poverty differentials at local level pose an even more serious challenge for the country's service delivery planning and general development goals. Some districts and local municipalities have more than 80% of their households classified as poor. The living conditions experienced in the high-poverty communities are appalling and render the populations in these areas vulnerable to infectious and communicable diseases.

Lastly, a worrisome trend emerging from the spatial analysis in this study is that between 1996 and 2007, there seems to have been gradual polarization of the country by poverty status, with poor households clustering in certain parts of the country and wealthy households in other parts of the country. This is a certainly undesirable trend from a social policy point of view.

NOTES

1. Several authors (e.g. Weeks 1999 and Tsheola 2002) have argued that the RDP type of policy framework and GEAR type of policies are not necessarily in harmony because they are based on conflicting ideological premises. The RDP prescribes an interventionist approach in poverty alleviation, whereas GEAR promotes a neoclassical approach with minimal government intervention. However, these arguments are beyond the scope of this chapter. Here the chapter just highlights the policies that are currently in place to address the problem of poverty in South Africa.
2. Some of the commonly used indicators include income, number of calories consumed, consumption expenditure, basic needs (e.g. food, shelter, clothing, etc.), capabilities (e.g. life expectancy, literacy rates, schooling, employment, etc.), and wealth (Blackwood and Lynch, 1994; Chaubey, 1995; Lok-Dessalien, 2000).
3. Multiple poverty lines can also be used to distinguish between different levels of poverty (Coudouel et al., 2002) because the characteristics of the poor may vary for different intensities of poverty (Glewwe and van der Gaag, 1988). Also, depending on the definition and conceptualization of poverty, the poverty line can be set as an absolute minimum (e.g. $1 per person/day) or a relative position (e.g. 1/2 median income).
4. In addition to three principal steps involved in measuring poverty, there are, in practice, other decisions that need to be made. These include the choice of unit of analysis (Atkinson, 1987; Madden, 2000; Ruggles, 1990). In general, under an assumption that within families or households, resources are pooled together and consumption decisions are made jointly, households are used as the unit of analysis in poverty studies (Ruggles, 1990).

5. Details about all these datasets can be found at www.statssa.gov.za.
6. Work is currently underway in Statistics South Africa to develop a national poverty line for South Africa (www.treasury.gov.za/povertyline).
7. A household is defined as a unit consisting of a single person or group of people who live together for at least four nights a week, eating together and sharing resources (Statistics South Africa, 1998).
8. Several approaches can be used to compute a composite index of living standards (see Hancioglu, 2005, and Simelane, 2007, and references therein for a discussion of these alternatives). The advantage of principal components analysis over these alternatives is that it uses the covariation of the variables included in the calculation of the index to assign weights to each variable and thus avoids subjective weighting.
9. The data for 2001 are not presented to save space, but they can be provided upon request.
10. Crowding is considered one of the key indicators of housing quality (United Nations, 2003), and it is generally calculated by dividing the number of rooms by household size. In this, a ratio of one person per room is considered ideal. However, based on general understanding of living arrangements of the majority of South Africans, this study argues that a room that is shared by two adults and one minor (0–5 years) is not necessarily crowded. This definition is an extension to Geyer's (2005) work, which also specifies that occupancy of two adults per room does not constitute crowding. Typically, children aged above 5 years move out of their parents' bedroom to sleep with siblings or have their own room. In order to isolate kids from adults, the study derives a new household size measure by assigning weights to individuals by age. Children aged 0 to 5 years are given a weight of 0.3, children aged 6 to 12 years a weight of 0.4, and adults (13 years and above) a weight of 1. The derived binary variable entering the analysis is defined as 1 = household NOT crowded if ratio ≥ 0.435 (i.e. greater or equal to 1/2.3 or one room per two adults and a minor), 0 = otherwise.
11. The increase in electricity and gas usage was accompanied by a corresponding decrease in the usage of paraffin and candles among the poor. Until 1996, candles were the main source of energy for lighting among the poor households of South Africa. In 1996, 54.1% of the poor households used candles for lighting, and the proportion decreased to 35.3% in 2007. The usage of paraffin for lighting among poor households decreased from 21.1% in 1996 to 9.6% in 2007.

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14 Demography of Disability in South Africa

Nicole De Wet and Leonard Ahuejere

1. INTRODUCTION

People with disabilities are often unable to participate fully in society. This often leads to exclusion by structures within society that favour the "able bodied," thus directly excluding people living with disability and putting them at greater risk of unemployment and poverty, disease, and lack of access to resources and services. People with disability, therefore, are vulnerable constituents of any society. In South Africa, as in other African countries, there is need to study the demographic and socioeconomic profile of this vulnerable population. The research questions that this chapter addresses are:

- How has the socio-demographic profile of disabled persons changed over time in South Africa?
- What are the demographic characteristics of persons with disability in South Africa from 1996 to 2007?
- What are the socio-economic characteristics of persons with disability in South Africa from 1996 to 2007?
- What are the odds of persons having disability in South Africa?

In this chapter, trends in disability from 1996 to 2007 are presented by various demographic and socioeconomic characteristics. This chapter also, by means of secondary data analysis, focuses on the likelihood of disability occurring in the country by a number of characteristics.

2. DEFINITIONS AND MEASURES

2.1. Definitions

According to the World Health Organization (1976), **disability** is "any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human

being." It encapsulates a number of varying functional boundaries. "People may be disabled by physical, intellectual or sensory impairment, medical conditions or mental illness. Such impairments, conditions or illnesses may be permanent or transitory in nature" (United Nations, 2010). Disability is not static; as such, a person can develop a short-term disability—for instance, due to a fall or stroke—and later recover (Freedman et al., 2004).

According to the new International Classification of Functioning, Disability and Health (ICF), disability is part of the general framework of health. Disability reduces the ability of a person to actively participate in various activities at society level (Heston and Noumbissi, 2005). The complexity of the term "disability" has given rise to a range of definitions, so there is no accepted gold standard for measuring people with disability (Freedman et al., 2004). Therefore, given the differing definitions of disability, it is suggested by the United Nations (UNDP, 1993) that a broad concept of disability be employed. This could later be changed for more specific definitions, dependent upon the coverage purpose of use (United Nations, 2010).

In 1993, about 10% of the world population was classified as disabled (UNDP, 1993). Disabled people may have experienced injury, trauma, or diseases that have temporarily or permanently influenced their mental or physical capacities (Noumbissi, 2003). Causes of disability may be the result of "an accident, contamination, disease or injury in social conflicts such as wars" and degenerative diseases due to aging (Heston and Noumbissi, 2005).

2.2. Measures of Disability

It is possible for a person to have more than one disability. The different types of disability in a study by Heston and Noumbissi (2005) were classified as follows: sight, hearing, physical, mental, and multiple disability.

Initiatives such as the Washington Group on Disability Statistics (WG) (Madans, 2004) and work by the World Health Organization (WHO) in collaboration with the United Nations Economic and Social Commission for the Asia-Pacific region (UNESCAP) (WHO/UNESCAP, 2008) are concerned with how to measure populations in a manner that is inclusive of all people with difficulties or disabilities (Schneider et al., 2009). There are other initiatives looking at disability measures; however, the work of the WG and WHO/UNESCAP has the widest global reach and is seen as the most significant (Schneider et al., 2009).

The WHO's International Classification of Functioning, Disability and Health (ICF) (World Health Organization, 2001) describes disability at three levels of functioning. "The first is that of body level where difficulties experienced are called impairments. The second level of functioning is the person level, which describes the execution of complex tasks and actions by an individual bringing together a range of different body level functions and structures" (Schneider et al., 2009). The third level is the societal level. This is defined as involvement in life activities and experienced difficulties. The ICF

argues that a person with disability can struggle at any one of the three levels or a combination of one or more levels of functioning (Schneider et al., 2009). However, in the case of censuses and surveys, it has been highlighted that it is important to select a level of functioning to report on most accurately—that is, the second or third level, as people can easily report on this.

The South Africa censuses focused at the person level, where basic activities and one complex activity such as self-care were measured without assistance, with the exception of seeing and hearing disabilities (Schneider et al., 2009). This WG Short Set (SS) is comprised of questions "covering six domains of basic activities (i.e. person level and touching on the body level): seeing, hearing, walking and climbing steps (lower body mobility), remembering and concentrating (cognition), self-care (which includes a component of upper body mobility—a basic activity—in the acts of dressing and washing) and communication" (Altman et al., 2005). Thus the WG SS is an easy, optimal tool for the measurement of disability.

3. METHODOLOGY

3.1. Data Sources

The data used for this study were from three sources, namely the South African Census 1996, South African Census 2001, and the Community Survey (CS) 2007.

In the 1996 and 2001 censuses, questions on disability were phrased as "does (the person) have a serious sight, hearing, physical or mental disability?" In the CS 2007, the question posed was under the prompt of "disability type." In all cases, the questions were aimed at finding out the disability status and/or the type(s) of disability a respondent has based on their understanding and interpretation of what constituted "a disability" and/or "serious disability." In all surveys, the questions were applicable only to persons with disabilities.

The responses for Census 1996/2001 questions gave prompts for the following responses: Sight (serious eye defects), Hearing/speech, Physical disability (e.g. paralysis), and Mental disability. The CS 2007 question on disability type offered the following responses: Sight (blind/severe visual limitation), Hearing (deaf, profoundly heard of hearing), Communication (speech impairment), Physical (needs wheelchair, crutches, etc.), Intellectual (serious difficulties in learning), and Emotional (behavioural, psychological) disability. All questions have a provision for multiple disability response at the final code list.

3.2. Methods

Analysis of the data took place in two stages for all years under review. The first was to generate frequency tables on the demographic and socioeconomic profiles of disabled South Africans. The second stage of analysis was

to conduct multivariate analysis. Multivariate logistic regression was done, and odds ratios were produced. This inferential analysis shows the likelihood of disability occurring over the time period.

4. RESULTS

4.1. Introduction

The 1996 Census did not collect data on "communication," "intellectual," and "emotional" disability. However, "intellectual" disability could be "mental" disability, which was not categorised in the 2001 census and the Community Survey of 2007.

This study has found that the most common types of disability are "physical" and "sight," with "communication" being the least common type. "Communication," "physical," and "emotional" disabilities have all increased over the years. "Sight," "hearing," and "intellectual" disability have, conversely, decreased over the years. The percentage of people with "multiple" disabilities peaked in 2001 and has since declined.

4.2. Demographic and Socioeconomic Characteristics of Disabled Population

Table 14.1 shows the percentage distribution of the disabled population by age, gender, race, province of residence, and marital status. It also shows the percentage distribution of the disabled population by usual place of residence, highest education level, occupation, and work status.

The age groups with the highest proportion of disabled persons from 1996 to 2007 are between the ages of 0 and 24 years old. There is a particularly high prevalence of disability between the ages of 5 and 19 years old. The proportion of disabled persons has been consistently low between the ages of 65 and 74 years old for all years used in this analysis. In terms of trends over the years, the table shows that the proportion of persons with disability has increased from 1996 to 2007 in the broad age group of 40 to 64 years. It is also noticeable that there has been an increase at the ages of 70 to 74 years old. In the age groups 20 to 24, 65 to 69, and 75+, there was a decline from 1996 to 2001 but an increase from 2001 to 2007. Alternatively, in the broad age group of 10 to 19 years, as well as in 25 to 29 and 35 to 49 years, there was an increase from 1996 to 2001, followed by a decline from 2001 to 2007.

There is a higher proportion of disability among females than males from 1996 to 2007. However, there are fluctuations of alternative trends for males and females over the years. For males, there was a decline from 1996 to 2001, followed by an increase from 2001 to 2007. Alternatively, for females, there was an increase in the percentage of persons with disability from 1996 to 2001, followed by a decline from 2001 to 2007.

Table 14.1 Percentage distribution of disabled population by demographic and socioeconomic characteristics in South Africa, 1996–2007

Characteristic	Census 1996	Census 2001	CS 2007
Age (in 5 years) group			
0–4	10.69	9.98	9.8
5–9	11.52	11	9.58
10–14	11.6	11.49	10.59
15–19	10.3	11.27	10.8
20–24	9.66	9.34	9.8
25–29	8.37	8.48	7.93
30–34	7.54	7.3	7.28
35–49	6.55	6.74	6.52
40–44	5.29	5.72	5.98
45–49	4.2	4.71	5.16
50–54	3.2	3.7	4.29
55–59	2.71	2.71	3.41
60–64	2.26	2.43	2.56
65–69	1.94	1.82	2.15
70–74	1.23	1.45	1.53
75+	2.96	1.88	2.63
Gender:			
Male	47.91	47.37	48.19
Female	52.09	52.63	51.81
Race:			
Africa/Black	77.25	79.24	76.98
Coloured	8.93	9.18	11.04
Indian/Africa	2.72	2.52	2.32
White	11.1	9.06	9.66
Province:			
Western Cape	9.99	10.28	10.97
Eastern Cape	15.18	14.44	15.39
Northern Cape	2.4	2.31	5.01
Free State	6.63	6.08	5.71
KwaZulu-Natal	20.71	20.2	20.71
North West	7.34	7.21	6.9

(*Continued*)

Table 14.1 (Continued)

Characteristic	Census 1996	Census 2001	CS 2007
Province:			
Gauteng	18.95	20.32	18.31
Mpumalanga	7.61	7.7	7.1
Limpopo	11.19	11.47	9.9
Marital Status:			
Never married	65.53	65.4	66.68
Married	25.98	23.36	21.87
Cohabiting	3.24	5.08	5.39
Widowed	3.38	4.19	4.37
Separated		0.73	0.66
Divorced	1.87	1.25	1.03
Socioeconomic characteristics			
Place of (Usual) Stay/Residence (4 nights/4 weeks):			
Usual resident	97.82	98.5	99.42
Visitor	2.05	1.5	0.58
No usual address	0.12	NC	NC
Highest Education Level:			
No formal education	22.3	15.92	8.91
Primary	26.42	37.14	26.78
Secondary	47.43	41.63	55.59
Tertiary	3.85	5.31	8.72
Occupation:			
Professional	19.03	19.29	20.13
Government Workers	1.02	0.65	10.14
Clericals	7.43	9.76	8.97
Sales	8.22	7.36	NC
Agriculture/Self-employed	7.75	7.45	4.25
Services	8.14	9.67	11.53
H/hold & d/worker	17.01	15.21	NC
Skilled manual	28.44	28.5	22.6
Unskilled manual	2.61	1.78	22.6
Clergy	0.21	0.21	NC
Others	0.14	0.13	NC

(*Continued*)

Table 14.1 (Continued)

Characteristic	Census 1996	Census 2001	CS 2007
Work status:			
Self-employed	6.97	7.77	33.65
Employer	4.2	1.49	0.55
Employee	87.01	88.92	31.93
Works in family business	1.82	1.35	2.18
Unpaid family worker	NC	0.46	31.69

(NC means "Not collected")

The racial profile of people with disabilities in South Africa shows that in 1996, White South Africans had the second-highest proportion of persons with disability, and in 2007 Coloureds had the second-highest proportion in the country. Overall, however, African/Black South Africans have the highest disability proportions in South Africa, accounting for more than 75% of persons with disability from 1996 to 2007. The proportion of persons with disability among the Coloured population has steadily increased since 1996 and among the Indian population has decreased from 1996 to 2007. For the White population, there was a decline in 2001 but an increase from then to 2007.

The prevalence of disability is highest in the KwaZulu-Natal and Gauteng provinces and lowest in the Northern Cape and Free State provinces of South Africa. There have been steady declines in the prevalence of disability in both the Free State and North West, and the province of the Western Cape shows a steady increase in the proportion of persons with disability. The Eastern Cape, Northern Cape, and KwaZulu-Natal show a decline in the proportion of persons with disability in 2001 but an increase from then to 2007. Alternatively, Gauteng, Mpumalanga, and Limpopo show disability proportions peaking in 2001, followed by a decline in 2007.

The proportion of persons with disability is highest among "never-married" South Africans at over 65% from 1996 to 2007. In addition, disability proportion is lowest among "separated" individuals from 2001 to 2007. In terms of trends, there has been a steady increase in the proportion of disabled persons in the categories of "never married," "cohabiting," and "widowed" from 1996 to 2007. Alternatively, there has been a decrease in the proportion of disabled persons in the "married," "separated," and "divorced" categories.

In terms of the education profile of disabled South Africans, almost half of the disabled people in the country have at most received a secondary education between 1996 and 2007. The proportion of disabled persons with no formal education is steadily declining, and the proportion of disabled people with tertiary education is increasing in the country. The prevalence

of persons with primary education peaked in 2007 and then declined in 2007. Conversely, the proportion of disabled persons with secondary education declined in 2001 but has since increased in 2007.

For occupation, most people with disabilities are found to be in "professional" and "skilled manual" positions. The most notable feature of this table is that between 2001 and 2007, there was an increase in disabled persons working in "unskilled labour" positions. In "clerical" and "skilled manual" positions, the percentage of disabled persons peaked in 2001 and declined in 2007. For "government workers," the proportion declined in 2001 and subsequently increased in 2007. For "sales," "agriculture (self-employed)," "household and domestic worker," and "other" positions, the proportion of disabled persons has decreased over time.

In 1996 and 2001, more than 87% of employed disabled persons were "employees," that is, working for someone else. However, in 2007, the highest proportion of disabled persons (33.65%) was "self-employed." This study also shows that over the years, there has been a decline in the proportion of disabled employers and an increase in proportion of disabled "unpaid family workers." The proportion of disabled "employees" peaked in 2001 (88.92%) and decreased in 2007 to 31.93%. Alternatively, the proportion of disabled persons working in family businesses declined to 1.35% in 2001 but increased in 2007 to 2.18%.

4.3. Occupation by Type of Disability, 1996 to 2007

This study showed that in 1996, the most prevalent type of disability among professionals was sight (15.47%). In 2001, this changed to intellectual disability (19.08%). Again in 2007 this changed, with multiple disabilities being most common among disabled professionals (6.9%). There were no data for household workers by type of disability in 2007. For skilled manual workers, hearing disability was most common in 1996 and 2001 at 35.66% and 32.17%, respectively. However, in 2007, the most prevalent type of disability for skilled manual workers was communication disability at 12.24%. For unskilled manual workers, physical disability was most prevalent in 1996 (3.77%) and in 2007 (23.16%), but in 2001, the most prevalent type of disability for unskilled manual labourers was communication.

The percentage of persons with no formal education and primary education who have sight problems has increased since 1996. Similarly, the same pattern has been recorded for persons who are self-employed and/or who are unpaid family workers. Alternatively, the prevalence of persons with sight disability who are employers and employees has declined over the period. In terms of highest education level and hearing disability prevalence in the country, there have been consistent fluctuations from 1996 to 2007, with primary and tertiary education peaking in 2001 and declining by 2007.

Similar to sight disability, the prevalence of hearing disability among self-employed and unpaid family workers has increased over the period

but steadily decreased among workers in family businesses and employees. The percentage of physically disabled persons with primary education has increased from 1996 to 2001 and decreased for those with no formal education. Also similar to sight disability, the percentages of physically disabled persons who are employers and employees have declined steadily over the period. However, the percentages of labourers in family businesses and unpaid family workers have increased over time. The trend for people with multiple disabilities and education follows the same pattern as those who have physical disabilities, with a decline in no formal education, an increase in primary education, and converse fluctuations with regard to secondary and tertiary education. Also similar to physical disability, the proportion of persons with multiple disabilities who are employed in the family business or who are unpaid family workers has increased from 1996 to 2007. The percentage of employees with multiple disabilities peaked in 2001, and for employers with multiple disabilities, there was a decline from 1996 to 2001, followed by an increase from 2001 to 2007.

4.4. Age and Schooling Profile

This graph shows that the percentage of children aged 5 to 10 years old who are disabled and not attending school is approximately 60% of the age cohort. The percentage of 16- to 20-year-olds disabled with no schooling in 1996 was lower than the percentage of 21- to 25-year-olds and 11- to 15-year-olds. This graph shows that more than 40% of disabled children aged 11 to 15 years and just more than 20% of those disabled aged 5 to 10 years had received primary education. The graph also shows that more than 30% of disabled people aged 16 to 25 years have received a secondary education. More than 70% of disabled persons aged 21 to 25 years have a "higher education" qualification.

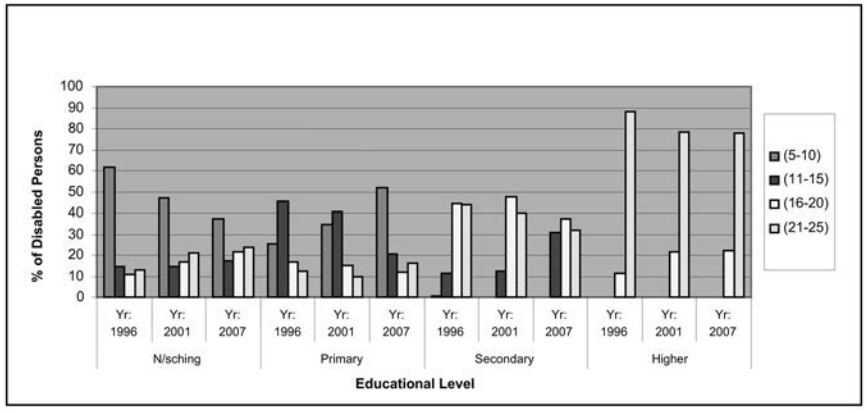

Figure 14.1 Percentage distribution of persons with disability by age and educational level in South Africa, 1996–2007

Of noticeable importance in this graph is that according to the 2001 census, the percentage of disabled young children (5 to 10 years old) with no schooling has decreased from 1996, proving that more disabled young children had access to education. However, for the rest of the educational categories, there are noticeable declines in the percentage of young people and children with disabilities receiving education. For 2007, there was a further decline in the percentage of under-10-year-olds disabled with no schooling. There was also a rapid increase in the percentage of 5- to 10-year-olds with primary schooling but a decline in the percentage of 16- to 25-year-olds with secondary education. Furthermore in 2007, the percentage of 21- to 25-year-olds with a higher education qualification had decreased from 1996 to 2001 and further declined in 2007. Overall, among all education qualifications, there has been a decrease from 1996 to 2007.

4.5. Determinants of Disability Status

Table 14.2 displays the adjusted logistic regression analysis showing odds ratios for respondent characteristics by type of disability in South Africa in 1996 to 2007.

The table shows that all tested characteristics have high likelihoods and, thus, are key predictors of disability type across the years (1996–2007) in SA. This, however, is with the exception of gender and highest level of education characteristics in 1996 and 2001 and types of social grant and occupation characteristics in 2007, which are not strong enough predictors (in some cases) across all types of disability, respectively.

5. DISCUSSION AND CONCLUSION

Disability is evident in the demographic and socioeconomic profile of South Africans. South Africans of all races and ages and both sexes are affected by disability. The African/Black population, older persons, and females are most affected. These percentages have fluctuated over time but appear to have decreased between 2001 and 2007. Disability also appears to be related to lower education and employment of South Africans. Over time, it is seen that the education and employment of disabled persons in South Africa has fluctuated. Given these trends from 1996 to 2007, this chapter endeavoured to infer probabilities of disability from various demographic and socioeconomic characteristics. It is the main findings from this multivariate analysis that will here be discussed, and overall conclusions will be drawn.

The multivariate analysis shows that the trend of odds of females developing hearing and physical disabilities has changed over the years. In fact, from 1996 to 2007, the odds of females having hearing and physical disabilities have changed from being unlikely (less than 0 odds) to likely (greater

Table 14.2 Logistic regression showing odds ratio estimates for the effect of demographic and socioeconomic variables on different types of disability in South Africa, 1996, 2001, and 2007

	Odd Ratio(s)											
	Hearing			Physical			Mental			Multiple		
Variable	**1996**	**2001**	**2007**	**1996**	**2001**	**2007**	**1996**	**2001**	**2007**	**1996**	**2001**	**2007**
Age:												
15–24	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC
25–34	0.87**	1.02	1.73	1.03	1.29	2.66	1.03	0.84	0.57	0.83**	0.85	3.14
35–44	0.77**	0.87	3.29	1.15	1.44	5.28	1.05	0.71	0.62	0.82**	0.74	1.5
45–54	0.48**	0.57	0.62	0.98	1.22	2.53	0.64	0.39	0.48	0.77**	0.67	1.59
55–64	0.47**	0.6	1.99	1	1.29	1.93	0.57	0.27	0.64	0.91**	0.72	0.67
65+	0.60**	0.59	3.51	0.92	1.16	1.22	0.71	0.25	2.75	0.98**	0.81	3.17
Gender:												
Male	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC
Female	0.62**	0.75	1.51	0.73**	0.76	1.12	0.50**	1.1	1.7	0.81**	0.87	1.02
Race:												
Africa/Black	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC
Coloured	1.96**	1.56	2.67	1.36**	1.68	1.31	2.53**	2.56	0.52	1.41**	1.69	2.9
Indian/Asian	1.67**	1.22	2.92	0.99	1.08	1.97	2.94**	1.81	28.74	1.45**	1.35	1.05
White	5.20**	3.2	0.72	3.21**	2.6	1.09	9.85**	3.53	24.13	2.63**	2.22	7.34

(*Continued*)

Table 14.2 (Continued)

	Odd Ratio(s)											
	Hearing			Physical			Mental			Multiple		
Variable	**1996**	**2001**	**2007**	**1996**	**2001**	**2007**	**1996**	**2001**	**2007**	**1996**	**2001**	**2007**
Province:												
Western Cape	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC
Eastern Cape	0.70**	0.78	1.71	0.47**	0.6	0.74	0.88**	0.76	0.19	0.62**	1.51	0.43
Northern Cape	0.81**	0.73	0.29	0.58**	0.76	1.71	0.83**	1.07	0.14	0.69**	0.78	3.96
Free State	0.69**	0.99	1.61	0.79**	1.03	0.63	1.03	1.08	0.1	0.57**	1.4	2.94
KwaZulu-Natal	1.04	1.49	2.1	0.73**	0.93	0.96	1.27**	1.02	0.62	0.74**	1.57	1.04
North West	0.76**	1.08	0.91	0.71**	0.86	0.53	0.80**	0.63	1.18	0.48**	1.65	0.24
Gauteng	0.96	0.88	2.29	0.60**	0.82	0.99	0.72**	0.48	0.15	0.69**	1.59	0.97
Mpumalanga	0.69**	0.64	3.78	0.53**	0.61	1.06	0.54**	0.48	0.06	0.63**	1.19	1.78
Limpopo	0.99	1.14	0.83	0.87**	0.64	0.35	1.01	0.92	0.04	0.59**	1.53	0.6
Type of place of residence:												
Urban	RC	NC	NC	RC	NC	NC	RC	NC	NC	RC	NC	NC
Rural	1.37**	NC	NC	1.60**	NC	NC	2.14**	NC	NC	1.40*	NC	NC

Marital Status:												
Never married	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC
Married	0.87**	1.17	1.99	0.73**	1.29	1.1	0.32**	0.95	4.59	0.92**	0.92	1.88
Cohabiting	0.90**	1.06	0.71	0.94**	1.22	0.69	0.58**	0.99	2.55	0.80**	1.19	0.88
Widowed	0.86**	1.05	0.78	0.75**	1.18	0.51	0.42**	0.63	6.39	0.93**	1.15	1.36
Divorced	0.87**	0.91	1.55	0.92**	1.03	0.97	0.64**	0.65	2.22	0.97	1.01	3.01
Highest Education Level:												
No Formal Education	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC
Primary	0.86**	0.82	1.5	0.85**	0.76	1.48	0.78**	0.62	0.88	0.87**	0.85	0.71
Secondary	0.55**	0.68	0.89	0.55**	0.6	1.15	0.43**	0.61	0.85	0.67**	0.67	0.28
Tertiary	0.36**	0.58	0.62	0.36**	0.48	0.71	0.17**	0.57	0.01	0.52**	0.67	0.25
Occupation:												
Professional	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC
Govt. workers	1.19**	1.49	0.73	1.48	0.89	1.21	1.17	0.97	3.62	1.43**	2.12	1.25
Clericals	0.91**	1.04	1.46	1.07	1.39	1.04	0.96	0.9	0.81	0.80**	0.97	1.06
Sales	1.49**	1.09	–	1.64**	1.44	–	1.63**	1.04	–	1.16**	0.94	–
Agric: Self-employed	1.73**	1.32	0.6	1.55**	1.47	0.73	1.64**	0.83	0.56	1.26**	1.15	0.53
Services	1.06**	1.18	0.63	0.98	1.34	1.1	1.28**	1	3.13	0.94	1.12	1.26

(*Continued*)

Table 14.2 (Continued)

	Odd Ratio(s)											
	Hearing			Physical			Mental			Multiple		
Variable	**1996**	**2001**	**2007**	**1996**	**2001**	**2007**	**1996**	**2001**	**2007**	**1996**	**2001**	**2007**
Household & Domestic workers	1.46**	1.22	–	1.78**	1.48	–	1.99**	0.96	–	1.35**	1.19	–
Skilled manual	1.47**	1.33	–	1.30**	1.24	–	1.33**	0.97	–	1.16**	1.27	–
Unskilled manual	1.59**	0.94	1.94	1.87**	1.31	1	1.85**	0.87	1.22	1.23**	1.28	0.33
Clergy	0.66**	1.15	0.99	0.9	1.58	1.03	1.98**	0.82	0.62	0.71	2.29	0.91
Others	1.20**	0.72	1.22	2.11	1.05	1.37	1.16	1.86	3.68	1.57**	2.36	0.79
Work status:												
Self-employed	RC	1.09	1.12	1.27	RC	1.7	RC	0.92	0.55	RC	0.99	0.5
Employer	1.09	1.27	1.15	1.08	1.24	1.32	0.84**	0.84	33.74	1.13**	1.21	0.73
Employee	1.05	RC	RC	RC	1.27	RC	1.11	RC	RC	0.90**	RC	RC
Works in family business	1.11	1.01	0.53	1.24	1.08	2.27	1.71**	1.08	18.39	0.50**	1.14	1

Reference category (RC) = Sight (i.e. comparison group)
**= Statistically significant
NC = Not collected

than 1 odds). Heston and Noumbissi (2005) found fewer females under the age of 40 to be disabled compared to males. According to Statistics South Africa, "it is not easy to ascertain the factors underlying the pattern for disabled persons, however, it could be a reflection of social biases in the reporting on disabled females by heads of households, or of factors such as higher rates of violence among males, higher rates of certain childhood conditions in males and the longer lifespan of females" (Stats SA, 2005).

The findings from the multivariate analysis of this study show the odds of having physical disability increase from 15 to 34 years and then decrease from 54 years to the 75+ age group. This is consistent with arguments presented by Watermeyer and others (2006), who reported that "in common with most (if not all) other countries, in South Africa, disability rates rise exponentially with age. Larger proportions of the populations with disabilities are therefore eligible for old-age pensions than in the population as a whole" (Watermeyer et al., pp. 230, 2006).

For disability by racial group in South Africa, this analysis shows that disability is highest among the African/Black population and lowest among Indians. However, this might be so as the African/Black population are in the majority while the Indian/Asians are in the minority respectively. According to Heston and Noumbissi (2005), this is particularly true of African/Black females, who have the highest prevalence of disability compared to any other demographic in the country.

Looking at the trend of racial probabilities of developing a hearing disability from 1996 to 2007, the logistic regression tables show that the probability of developing a hearing disability across all racial groups (with the exception of the reference group) has declined. In 1996, it was likely that hearing disability would occur to the Coloured, Indian/Asian, and White populations. In 2001, this remained likely, but the adjusted odds ratios decreased, and in 2007, it became unlikely that the Indian/Asian population would have a hearing disability. For physical disability by race, the odds increased from 1996 to 2001 and then declined from 2001 to 2007.

Overall, the logistic regression analysis shows that for Coloureds, the odds of disability occurring have remained consistently higher than for the African/Black population. An increase and improvement in the enumeration and reporting of disability by the Coloured population since the end of apartheid could be the reason the likelihood of disability occurring is increasing. More information is needed on whether disability among Coloured and African/Black people occurs at birth or develops due to accident or injury. With this type of information, it is possible to ascertain whether there are physiological risks or if disability risk is related to occupation and other socioeconomic conditions. This suggestion is made because the African/Black and Coloured populations are the largest racial groups in South Africa and also have the lowest socioeconomic status. Thus, the relationship between employment status and disability in South Africa requires further scrutiny.

In terms of disability and work status, it was found that in 2007, most of the working disabled persons in the country were self-employed, with very few being employers. According to Stats SA, in 2005, nationally 22% of disabled males and 15.2% of disabled females were employed. Thus, although employment rates for disabled persons in specific work-type categories are improving, there remains a substantial proportion of disabled South Africans who are still unemployed. Similarly, the odds of employers having a disability have remained likely from 1996 to 2007. In addition, the likelihood has increased over time. Due to the very nature of some forms of disability, such as physical, sight, or hearing, disabled persons will be unable to secure employment in office-related environments. The only alternative, then, is for them to be self-employed or employers in the informal labour market. This is consistent with a report prepared by the Child Health Policy Institute (CHPI) and the South African Federal Council on Disability (SAFCD; 2001) who attributed the exclusion of disabled persons from the labour force to:

- "Low skills level due to inadequate education;
- Discriminatory attitudes and practices from employers
- Inaccessible and unsupportive work environments;
- Inadequate and inaccessible provision for vocational rehabilitation and training;
- Menial labour is often the only option for poorly skilled job-seekers" (CHPI & SAFCD, 2001: pp 17–18).

Related to this issue is the occupational profile of the disabled in South Africa. In 2007, more than 40% of disabled South Africans were employed in skilled and unskilled manual labour positions. This implies that most disabled workers are employed in manual positions. These employees, having already the disadvantage of a disability, are not perfectly suited for manual labour. Those with physical and/or sight disabilities, for example, are especially unsuitable for manual labour positions. The appointment of disabled people in these positions is related to their education status. That is, manual labour positions do not require tertiary education and training, especially unskilled manual labour. Thus addressing the issues related to low tertiary enrolment and graduation will address the issue of unsuitable occupational category in this regard.

In South Africa, levels of poverty are closely related to educational status. From 1996 to 2007, the odds of hearing disability occurring declined as educational level increased. For the likelihood of physical disability occurring by highest education level, from 1996 to 2007, the chances of physical disability declined as education increased. Since it is argued that disability is both a cause and a consequence of poverty (Emmet and Alant, 2006), the impact of education on the likelihood of disability is important since, like poverty, education seems to act as a buffer to disability in South Africa.

In this study, an important finding was the low percentages of disabled persons with "no formal education" and the high percentages of persons with "secondary" education throughout the period. This is a good sign and indicative of progressive steps towards the development of disabled individuals in the country. However, the percentages of disabled people with tertiary education are low—less than 10% for each year under review. The gap between secondary and tertiary education is substantial, and in 2007, only approximately 9% of disabled prior high school graduates had a tertiary education. This leads to two important conclusions. First, the vast majority of disabled persons in South Africa do not have professional qualifications from tertiary institutions; and second, the reasons for low tertiary rates require further investigation. On this latter point, potential and existing barriers restricting disabled persons from tertiary education need to be studied in order to address the issue.

Finally, not all disabled persons in South Africa have the same needs. In the case of education, for example, persons with sight disability require different learning tools and materials compared to those with hearing disabilities. Another example is that actual access, disability-friendly parking and walkways, and office and classroom access are needed for those with physical disability. Thus, given the different demographic, socioeconomic characteristics and types of disability, as well as the varying odds of disability, the country needs to acknowledge that a "one-size-fits-all" approach to addressing these needs is not acceptable.

For research, this study has demonstrated the use of statistical methods in studying social issues. Qualitative research on the experiences and challenges of disabled persons has its strengths. However, the quantitative approach of this study provides broad, generalizable information on the entire disabled population of South Africa. This information is vital for identifying, within the disabled population, subgroups that require further in-depth study, such as disabled females. Methodology and data can thus be used to study other social issues in the country. Inferential statistics offer valuable information for provision of service needs in the future and for identifying key areas of prevention. Census and survey data are useful because they offer personal accounts of social issues, such as type of disability. These sources are also nationally representative and allow for geographic comparisons of the level of the problem, both within and between countries.

For policy and programmes in the country, this study fits into the aims of the Integrated National Disability Strategy (1997), which seeks to contribute to the development of disabled people. In order for development to occur, background information on the education and employment characteristics of disabled people is needed. This study has provided such information. This will assist the strategy in implementing programmes that are empirically based. The inferential findings presented here will further assist this national strategy and others in identifying high-risk situations which increase the odds of disability among South Africans. This is fundamental to prevention programmes such as the Prevention of Blindness Programme (2002).

This chapter has highlighted all the dynamics of disability in South Africa and should be used as a reference in making policy recommendations to assist the disabled members of South African society.

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15 Gender Disparities in South Africa

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1. INTRODUCTION

An analysis that takes gender into account is essential for policy formulation and programme planning to ensure equity in resource allocation (Damian, 2005). When gender gaps are identified, planners can develop appropriate strategies to correct imbalances, influence budgetary allocations, and focus on improving human resources for sustainable development. Within the South African context, these vulnerabilities are compounded by racial, class, and geographical factors. Thus, when developing plans and programmes to address the imbalances within the society, a gender perspective provides a critical lens through which these layers of inequality can be considered.

According to the gender framework adopted by the Council of Ministers in South Africa:

> Differential access to employment opportunities exists. Whilst theoretically women currently have access to a broader scope of position in the labour market, these new opportunities are accessible to a narrow pool of women who have had access to skills development, education and training. In large measure, women's employment remains either within the traditional female occupations or within the domestic and farming sectors all too often as casual workers. They are concentrated within positions that are low paying and have high rates of turnover. . . . Women constitute the poorest group in South Africa and are more likely to be unemployed or underemployed. The challenge is to ensure that South Africa's macroeconomic strategy promotes economic growth and sufficiently addresses the differential impact of macroeconomic policy on various groups of people depending on class, race, age, gender, location and disability.
>
> (Department of Public Service and Administration, 2006)

The main objective of this chapter is to provide insights into gender disparities in educational achievements, work status, and income in South Africa based on the data collected in the 2007 Community Survey (CS 2007)

among persons aged 25 to 64 years. The chapter also provides insights into disparities pertaining to households' access to basic services, particularly housing and goods. These issues were selected for analysis because they provide insights into the gender disparities in terms of socioeconomic conditions, household, and individual well-being.

2. DATA SOURCES AND METHODOLOGY

The main source of data for this analysis is the 2007 Community Survey (CS 2007). In addition, the 1996 and 2001 census data (10% sample) are also used, especially while considering trends. The 1996 census was the first census carried out immediately after the abolishment of apartheid. Five years later, in 2001, a second census was carried out. In order to inform policy, when the shift went to a ten-year interval, a large community survey was carried out in 2007.

The CS 2007 is the largest survey that has ever been undertaken by Statistics South Africa. The survey collected data pertaining to population size, composition and distribution, fertility, mortality, migration, disability and social grants, school attendance and educational attainment, labour force and income, housing conditions, and household goods. The survey took place in February 2007. It covered 246,618 households and 949,105 persons. In order to ensure that it followed the same structure as the 2001 population census, weights were introduced in the data in order to achieve an estimate of the total population, its composition, and its structure. Details about the methodology of the data collection can be found in "The Statistics South Africa in the methodology, processes and highlights of key results release" (Statistics South Africa, 2007).

Analysis was done using bivariate analysis. Province, gender, and race were each cross-tabulated with the socioeconomic variables in turn, namely education, employment, income, and access to basic social services and amenities. Gender analysis was done by separating data by sex across the selected socioeconomic groupings.

The analysis by province, gender, and race is motivated by the importance each has in explaining socioeconomic dynamics within South Africa. For example, each province has its own provincial government, with legislative power vested in a provincial legislature and executive power vested in a provincial premier, exercised together with the other members of a provincial executive council and distinctive landscape, population, economy, and climate.

Although South Africa has a diversity of population groups, these can be grouped into four broad categories, namely the Black African, comprising mainly the indigenous people; the Indian/Asian, mostly descended from India; the White, comprising the descendants from Europe, especially the Dutch and the British; and the Coloured, a people of mixed lineage

descended from slaves brought to the country from east and central Africa, the indigenous Khoisan who lived in the Cape at the time, indigenous Africans, and Whites.

With the housing conditions, the analysis compared the gender ratio, gender gap, and relative gap in relation to the type of dwelling, source of energy, water, possession of a refrigerator, garbage disposal, toilet facility, and communication. Communication looked at the possession of cell phones, landline telephones, radio, TV, both radio and TV, computer, Internet, and post office box.

3. FINDINGS

3.1. Sex Ratios by Province, Race, and Age

Table 15.1 provides sex ratios by province of enumeration, population group, and age. Gauteng is by far the most populated province, followed by KwaZulu-Natal and Mpumalanga in the second and third positions. On the other hand, the Northern Cape has the smallest number of inhabitants—481,968, less than a tenth of the number of people who live in Gauteng.

Table 15.1 Gender composition of the population (25–64) by province and gender, Community Survey 2007

	Number	Male	Female	Sex ratio
Province				
WC	2,598,981	48.3	51.7	93.5
EC	2,355,850	44.4	55.6	79.8
NC	481,968	49.3	50.7	97.4
FS	1,247,900	48.4	51.6	93.8
KZN	4,057,052	45.9	54.1	84.9
NW	1,482,646	51.9	48.2	107.7
GT	5,444,169	50.3	49.7	101.1
MP	3,297,710	60.7	39.3	154.5
Population Group				
Black African	15,451,436	51.0	49.1	103.9
Coloured	2,057,853	47.7	52.3	91.3
Indian or Asian	713,533	45.5	54.5	83.6
White	2,743,454	48.6	51.4	94.6

(*Continued*)

Table 15.1 (Continued)

	Number	Male	Female	Sex ratio
Age group				
25–29	3,913,393	49.1	50.9	96.3
30–34	4,007,604	55.1	44.9	122.9
35–39	3,213,992	48.9	51.1	95.9
40–44	2,967,443	50.7	49.4	102.6
45–49	2,319,563	48.1	51.9	92.6
50–54	1,850,072	50.0	50.0	100.2
55–59	1,611,062	46.5	53.5	86.8
60–64	1,083,148	47.9	52.1	91.9
Total	**20,966,276**	**50.1**	**49.9**	**100.6**

Note: These sex ratios may slightly differ from what was published because of the introduction of institutional population and weights.

There was a wide variation in the sex ratios by province amongst individuals aged 25 to 64. There are slightly more males than females, with a sex ratio of 100.6 men for every 100 women. Within the different provinces, three provinces—namely Mpumalanga, North West, and Gauteng—have more males than females. Mpumalanga has the highest sex ratio, of 154 men for every 100 women. The remaining provinces have fewer males than females. Among them, Eastern Cape has the lowest sex ratio; this may be due to out-migration of a majority of men to other provinces in search of employment opportunities. The second background characteristic considered is population group. In this age category (25–64 years), the sex ratio is lowest amongst the Indians/Asians, followed by the Coloureds. The differences in sex ratio, especially among the Indian/Asians and the Whites, can be explained by out-migration to other countries. However, the high sex ratio for the Black Africans is due in in-migration from the neighbouring countries, especially Zimbabwe, Lesotho, and Swaziland, for men who come to search for employment.

Sex ratios were also considered by age group. Among individuals aged 25 to 64, there were variations in sex ratios. Age groups 25 to 29, 35 to 39, 45 to 49, 55 to 59, and 60 to 64 showed a sex ratio of less than 100, implying that there were more females than males. On the other hand, age groups 30 to 34, 40 to 44, and 50 to 54 showed a sex ratio of more than 100. In a normal population distribution, the number of females is slightly higher than that of males. The age group with the highest sex ratio is 30 to 34 years, where there are 123 men per 100 women. However, by the time individuals reach the ages of 55 to 59 years, the sex ratio decreases drastically, to 87 men for every 100 women. This rises to 92 men per 100 women in the age group 60 to 64.

3.2. Gender and Educational Attainment

Table 15.2 shows educational attainment by gender between 1996 and 2007. There was a general improvement in educational achievement within South Africa. Overall, the proportion with no schooling among those aged 25 to 64 years declined. The rate of decline between 1996 and 2001 was minimal, but there was a distinct decrease between 2001 and 2007, from 18.7% in 1996 to 17.3% in 2001, declining in 2007 to 8.6%. Though the proportion of women without schooling is higher than that of men, the proportion of women with no schooling dropped by 10.7% compared to 9.6% for men between 1996 and 2007. Similarly, the proportion of individuals with some primary education dropped slightly over the eleven-year period, implying that a higher proportion of the population had completed at least primary school education.

The analysis further reveals that the proportion completing primary education declined drastically between 1996 and 2001 and declined further by 2007. However, this decrease is a result of both men and women continuing to receive secondary education and higher, which is a positive trend.

By gender, the proportion of women with some primary education declined more than that of men, an indication that not only are more women

Table 15.2 Educational achievement (25–64) by population and gender, Census 1996, 2001, and Community Survey 2007

	1996			2001			2007		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
RSA									
No schooling	16.9	20.3	18.7	15.4	19.0	17.3	7.6	9.6	8.6
Some primary	18.3	17.8	18.1	18.0	17.0	17.5	16.8	16.1	16.5
Completed primary	17.5	18.2	17.9	6.8	7.1	7.0	6.7	5.9	6.3
Some secondary	20.5	21.2	20.9	29.9	29.7	29.8	36.4	35.5	36.0
Grade 12/std10	17.8	15.2	16.4	20.2	18.2	19.2	13.8	14.0	13.9
Higher	9.0	7.2	8.1	9.6	9.1	9.3	18.7	18.9	18.8
Black African									
No schooling	21.6	25.7	23.8	19.3	23.8	21.7	9.4	12.3	10.9
Some primary	22.2	20.9	21.5	21.4	19.6	20.4	20.2	19.2	19.7
Completed primary	19.5	19.6	19.5	7.7	7.6	7.7	7.7	6.4	7.0
Some secondary	19.7	19.4	19.6	29.5	28.6	29.0	38.9	37.2	38.1
Grade 12/std10	12.8	10.3	11.5	16.6	14.4	15.4	12.0	11.4	11.7
Higher	4.2	4.2	4.2	5.4	6.0	5.8	11.9	13.6	12.7

(*Continued*)

Table 15.2 (Continued)

	1996			2001			2007		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Coloured									
No schooling	9.7	9.5	9.6	7.9	7.9	7.9	5.0	5.1	5.1
Some primary	20.0	20.8	20.4	19.4	19.8	19.6	16.6	17.3	17.0
Completed primary	23.9	27.7	25.9	9.4	11.3	10.4	8.3	10.3	9.4
Some secondary	26.5	26.7	26.6	40.6	41.1	40.9	43.4	42.6	43.0
Grade 12/std10	14.0	10.4	12.1	17.5	15.0	16.2	14.7	13.3	14.0
Higher	5.9	4.8	5.3	5.3	4.9	5.1	12.0	11.4	11.7
Asian/Indian									
No schooling	2.7	7.6	5.2	2.6	5.5	4.1	1.7	2.6	2.2
Some primary	4.8	11.4	8.2	4.4	9.9	7.2	4.1	7.2	5.8
Completed primary	16.3	21.2	18.8	3.2	5.5	4.4	2.9	3.6	3.3
Some secondary	29.1	26.8	27.9	35.5	36.6	36.0	31.2	42.9	37.6
Grade 12/std10	32.3	24.2	28.1	36.8	29.1	32.8	26.5	18.3	22.0
Higher	14.9	8.9	11.8	17.6	13.4	15.4	33.6	25.4	29.1
White									
No schooling	1.0	1.1	1.1	1.2	1.3	1.3	0.4	0.5	0.4
Some primary	0.5	0.5	0.5	0.8	1.0	0.9	0.6	0.6	0.6
Completed primary	3.2	3.2	3.2	0.5	0.6	0.6	0.5	0.7	0.6
Some secondary	18.1	26.0	22.1	22.8	25.3	24.1	17.8	19.4	18.6
Grade 12/std10	42.7	43.7	43.3	39.4	41.5	40.5	21.0	27.5	24.4
Higher	34.6	25.5	29.9	35.3	30.2	32.7	59.7	51.5	55.5

going to school, but they are also completing at least primary education and are therefore able to move into secondary-level schooling. The proportion of both men and women with incomplete secondary education increased by almost 15%, with no difference in the increase between men and women. There was also a decline in the proportion of those completing and ending their education at secondary level. However, this decline at secondary level is proportionate to the increase in the higher education levels.

3.3. Gender and Educational Achievement within Different Population Groups

Table 15.2 shows educational level achievement by gender, controlling for population group. Among the Black population, a higher proportion of

females (13.6%) had higher education compared to males (11.9%). On the other hand, 12.3% of females had no education, compared to 9.4% of men. Among the Coloured population group, the same proportion (5.1%) of females and males had no schooling. As with the Black population, educational attainment does not depend on gender amongst the Coloured population. This finding suggests that both men and women are disadvantaged in terms of educational achievement among the Coloured population.

The Indian/Asian population group is somewhat different from the other population groups. The differences in the proportions at any educational level are wide, ranging from no schooling to higher levels of educational attainment. This group also has one of the lowest proportions of no schooling (1.7% among males and 2.6% among females). For those with some primary education, the proportion of Indian/Asian males is 4.1%, but it is 7.2% amongst females. For those who completed their secondary education as well as those with a tertiary education, the difference between males and females is 8.2%.

White males were more advantaged than White females. Although the White population group has the highest proportion of individuals with higher educational qualification (56%), 60% of White males have a tertiary qualification compared to 52% of White females. Though the difference is minimal, a higher proportion of White females than males has completed lower educational levels. On the other hand, White females have a much higher proportion (27.5%) that completed secondary schooling than White males (21.0%).

3.4. Trends in Educational Attainment

From Table 15.2, trends in educational attainment are observed across the different population groups and also by gender from 1996 to 2007.

The proportion of those attaining higher education increased across all population groups. However, the increase was not uniform across the different population groups and across gender. The lowest increase of the proportion with higher education was among the Black men, standing at 4.2% in 1996, increasing to 5.4% in 2001, and increasing further to 11.9% in 2007. The proportion of Black women with higher education increased slightly more than that of Black men, which was 4.2% in 1996 and rose to 13.6% in 2007.

Of those with no schooling, little change was recorded among the Coloureds; this decreased from 9.7% and 9.5% to 5.0% and 5.1% for men and women in 1996 and 2007, respectively. Whereas in 1996 the proportion of Coloureds with higher education was greater than that of Black men and women, in 2007, that of Coloured and Black men was the same, while for Black women it was greater than for Coloured women.

The Indian/Asian population group showed an improvement in educational attainment. The percentage of Indians/Asians with a higher education

increased from 11.8% to 29.1% between 1996 and 2001, respectively. The percentage increase was almost the same for men (18.7%) and women (16.5%) between 1996 and 2007. Similarly, the proportion of the Indian/Asian population group with primary education or less reduced among women over the period, from 40.2% to 13.4%. This implies that the Indian/Asian population groups are attaining higher educational qualifications, especially women.

In 1996, the proportions of White men and women with primary education or below were 4.7% and 4.8%, respectively. The differences could only be noticed at higher educational levels, that is, the completion rate was better for men than women. The White population group showed greater educational attainment among females. In 1996, one in four females had a higher education qualification among those aged 25 to 64 years. In 2007, one in two White women aged 25 to 64 had a higher education qualification.

3.5. Working Status by Gender

The Gender Policy Framework establishes guidelines for South Africa as a nation to take action to remedy the historical legacy by defining new terms of reference for interacting with each other in both the private and public spheres and by proposing and recommending an institutional framework that facilitates equal access to goods and services for both women and men. In order to fulfil this, the gender framework spells out areas in which gender issues must be tackled, including women's empowerment, as well as gender and development. In order to achieve women's empowerment, men and women must have equal access to employment.

Figure 15.1 shows the proportion of individuals working between the 2001 census and CS 2007. There was an increase in the proportion of individuals working between 2001 and 2007. The proportion of women

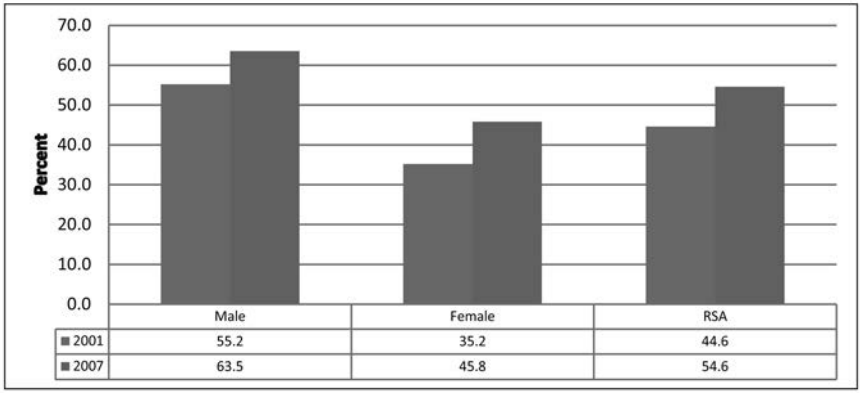


Figure 15.1 Proportion working 25–64 by gender, Census 2001 & CS 2007

working was less than that of men. Over the period 1996 to 2007, the proportion of working women increased at a faster rate than that of men. In 2001 and 2007, the proportion of men working increased by 8%, while the proportion of women increased almost by 11%, from 35.2% to 45.8%. This increase is the result of educational achievements by women, especially at higher educational levels.

3.6. Working Status by Gender, Controlling for Population Group

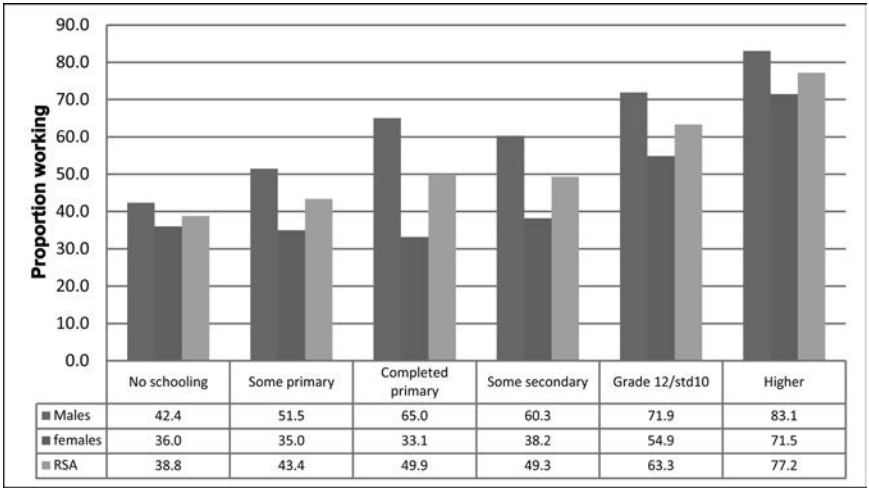
Among the population aged 25 to 64 years, those who were working varied between men and women (Table 15.3). Among men, about two thirds (63.5%) were working, compared to less than half (45.8%) of the women.

Variations were also observed by population groups. The highest proportion of those working was among the White population (77.3%), followed by the Coloured population (59.0%). The lowest was among the Black African population group (49.9%). The population group with the lowest proportion of females who were working was the Indian/Asian, with 38.8% working. This was followed by Black African women at 41.4%. The White population had the highest proportion of women who were working (68.1%). Among males, 87.2% of White males were working, followed by Indian/Asian males (76.4%). This was lowest among the Black African males (58.3%). As with educational achievement, Indian/Asian men were second to Whites among those working. However, the Indian/Asian population had the lowest proportion of women working.

Furthermore, from Table 15.3, it can be observed that by gender, irrespective of population groups, the proportion of working women is less than that of working men. The Indian/Asian population group had the greatest discrepancy in employment. Also, it was observed that the proportion of White working females is higher than the proportion of working Black African males.

Table 15.3 Working status (25–64 years) by population group and gender, Community Survey 2007

	Men		Women		RSA	
Population group	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Black African	7,643,384	58.3	7,505,218	41.4	15,148,602	49.9
Coloured	948,743	68.6	1,057,995	50.4	2,006,738	59.0
Indian/Asian	321,354	76.4	385,450	38.8	706,804	55.9
White	1,304,136	87.2	1,388,492	68.1	2,692,628	77.3
Total	**10,217,617**	**63.5**	**10,337,155**	**45.8**	**20,554,772**	**54.6**



	No schooling	Some primary	Completed primary	Some secondary	Grade 12/std10	Higher
Males	42.4	51.5	65.0	60.3	71.9	83.1
females	36.0	35.0	33.1	38.2	54.9	71.5
RSA	38.8	43.4	49.9	49.3	63.3	77.2

Figure 15.2 Proportion working by educational level and gender 25–64, CS 2007

3.7. Working Status by Educational Attainment

Figure 15.2 compared women and men who are working by different educational levels. Among men, the proportion of those who are working increases with increasing educational level, from 42.4% among those without any education to 83.1% among those with a higher education. This is true for the entire South African population, where only 38.8% among those without any schooling are working. This increased to 43.4% among those with primary education and to 77.2% among those with a higher educational level.

The profile for females is quite different. The proportion of females working decreases with increasing levels of education, from 36.0% among those without any education to 35% among those with some primary education and further to 33.1% among those with a completed primary education. The proportion then rises to 38.2% among those with some secondary education. It rises further to 54.9% among those who have completed their secondary education and to 71.5% among those with higher education.

3.8. Working Status by Educational Attainment, Controlling for Population Group

When we control for population group, we observe that overall, the proportion of people that are working increases with increasing levels of education, irrespective of the population group, as displayed in Figure 15.3. The Indian/Asian population group has the lowest proportion of those

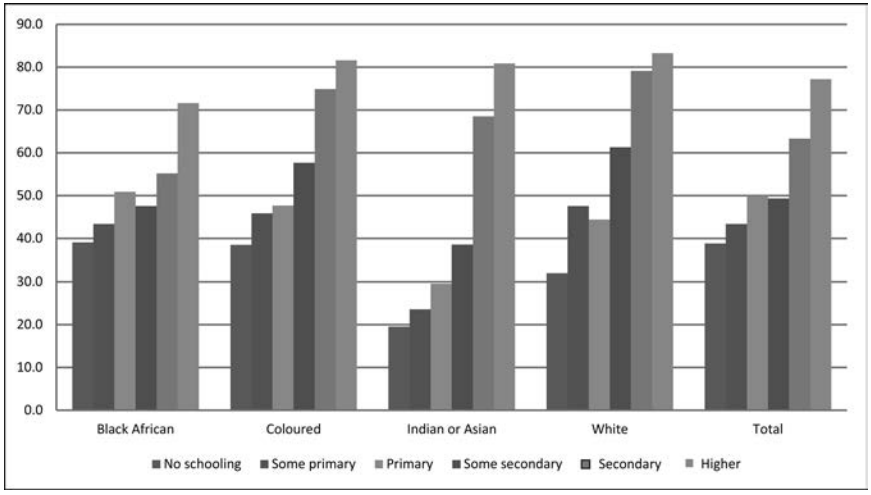


Figure 15.3 Proportion employed (25–64) by education level and population group, CS 2007

not working amongst those who had no schooling. This is followed by the Whites. On the other hand, the Black African population group has the highest proportion of those working amongst those without any education (39%), followed by the Coloured population group at 38%.

Table 15.4 shows working status by gender. At higher levels, apart from Black Africans at 72%, in all other population groups, the proportion of those with higher educational level who were working was above 80%. Considering those with no level of schooling, among the Whites, more females were reported to be working (32.2%) than males (31.8%). On the other hand, the gap between males and females is very high amongst those that are working in the Indian/Asian population group. The proportion of Indian/Asians who were working was 9.6% for females and 37.5% for males, which is four times higher than among those without any education.

Considering those with some primary education, apart from the Indian/Asian population group, the proportion of males working was above 50% (Black Africans 51.0%, Coloureds 57.2%, and Whites 59.5%). However, apart from Indians/Asians at 16.5%, the proportion of women who were working was about one in three among those with some primary education (Black African females 35.2%, Coloured females 36.2%, and White females 34.7%).

The proportion who were working among the males with completed primary education rose in all population groups to about two thirds. It stabilised for women at one third among those with completed primary education. The Indian/Asian community continues to lag behind, among those who were working, for both males and females.

Table 15.4 Working status (25–64) by population group and gender (controlling for educational attainment), Community Survey 2007

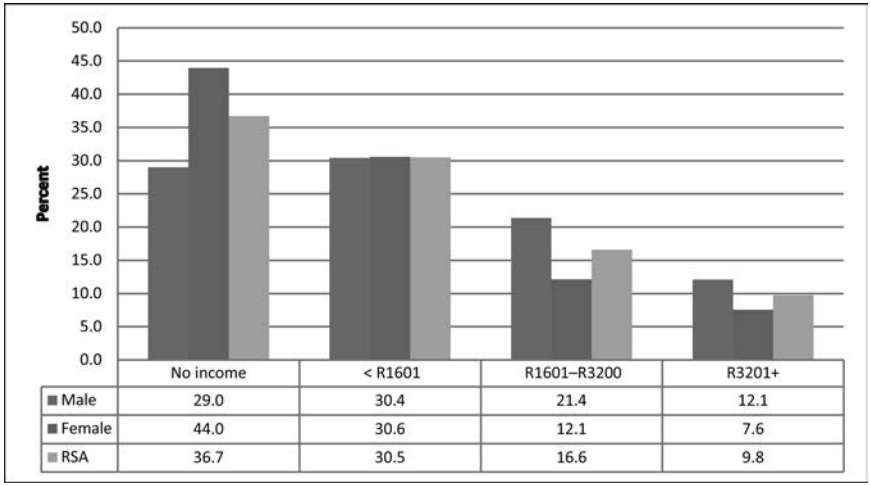
		Black African	Coloured	Indian or Asian	White	Total
No schooling	**Male**	42.1	48.3	37.5	31.8	42.4
	Female	36.7	29.9	9.6	32.2	36.0
	RSA	39.1	38.5	19.5	32.0	38.8
Some primary	**Male**	51.0	57.2	38.5	59.5	51.5
	Female	35.2	36.2	16.5	34.7	35.0
	RSA	43.4	45.9	23.6	47.6	43.4
Primary	**Male**	65.9	60.9	47.6	61.7	65.0
	Female	32.5	38.2	17.6	32.2	33.1
	RSA	50.9	47.7	29.6	44.4	49.9
Some secondary	**Male**	57.8	68.1	67.9	75.4	60.3
	Female	36.6	48.1	20.9	49.2	38.2
	RSA	47.6	57.7	38.5	61.3	49.3
Secondary	**Male**	65.2	80.3	82.4	86.9	71.9
	Female	44.4	69.4	51.8	73.5	54.9
	RSA	55.2	74.9	68.5	79.1	63.3
Higher	**Male**	74.3	85.9	89.2	92.0	83.1
	Female	69.2	77.5	71.7	73.7	71.5
	RSA	71.6	81.6	80.9	83.3	77.2

The proportion who were working rose further in all the population groups among those with some secondary education. Among individuals with some secondary education, the proportion employed among males is lowest among Black African males (57.8%) and Indian/Asian females (20.9%). For those with completed secondary and higher education, the proportion working is lower for Black African males and females.

3.9. Income and Gender

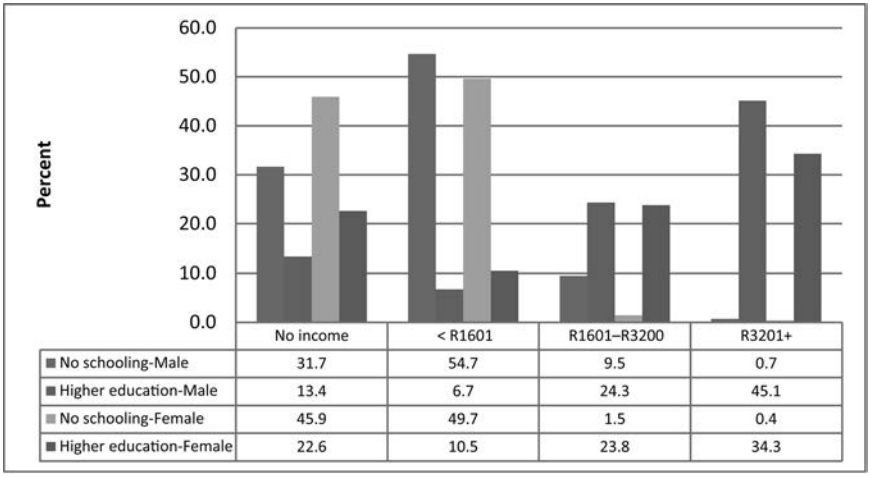
The CS 2007 included a question on the income of the individuals within the household. Five income categories were created, namely "no income," "less than R1601," those earning between R1601 and R3200, and in the last group those earning R3201 and more.

From Figure 15.4, it is observed that among those aged 25 to 64, 44% of women did not earn any income compared to 29% of men. Among those earning some income but less than R1601, the same proportion of males (30.4%)



	No income	< R1601	R1601–R3200	R3201+
Male	29.0	30.4	21.4	12.1
Female	44.0	30.6	12.1	7.6
RSA	36.7	30.5	16.6	9.8

Figure 15.4 Income level by gender (25–64 years), CS 2007



	No income	< R1601	R1601–R3200	R3201+
No schooling-Male	31.7	54.7	9.5	0.7
Higher education-Male	13.4	6.7	24.3	45.1
No schooling-Female	45.9	49.7	1.5	0.4
Higher education-Female	22.6	10.5	23.8	34.3

Figure 15.5 Comparison of income by no school and higher level

and females (30.6%) was observed. The proportion of men earning R3200 and above was higher than that of women.

Among those without any income, the proportion of women was higher than that of men. On the other hand, for those who earn higher incomes, the reverse was observed; the proportion of men was higher than that of women.

Among females, 45.9% of those with no schooling also had no income, compared to 31.7% of their male counterparts. The majority of those with no schooling earn less than R1601, that is, 49.7% of females and 54.7% of males (Figure 15.5).

Table 15.5 Income category by population group (25–64) and gender, Community Survey 2007

	No schooling				Higher educational level			
Males	**Black African**	**Coloured**	**Asian/Indian**	**White**	**Black African**	**Coloured**	**Asian/Indian**	**White**
No income	33.1	19.0	21.6	18.0	22.3	9.9	7.8	3.4
< R1601	53.7	65.2	36.3	51.7	10.6	7.8	5.1	1.9
R1601–R3200	9.5	8.9	20.6	4.5	36.4	23.4	24.1	9.2
R3201+	0.6	0.5	5.9	13.5	23.4	45.1	49.5	72.4
Not stated	3.1	6.5	15.7	12.4	7.5	13.7	13.5	13.1
Female								
No income	47.0	36.8	28.7	36.5	27.2	17.2	24.1	16.0
< R1601	49.2	54.9	60.5	34.6	10.2	9.2	4.9	12.1
R1601–R3200	1.3	2.3	4.3	9.4	27.6	27.7	21.3	17.1
R3201+	0.4	0.4	1.6	8.4	28.8	33.6	36.1	43.2
Not stated	2.2	5.6	4.9	11.2	6.2	12.4	13.5	11.6

Less than 2% of the females with no education earned more than R1601. For the males, one in ten earned between R1601 and R3200, with 0.7% of the males with no schooling earning more than R3200. Among females, slightly less than eight in ten have some income among those with a higher educational qualification. One in three of the females (34.3%) with a higher education earned more than R3200. The proportion of males who also earned more than R3200 among those with higher education was 45.1%.

3.10. Gender, Education, Income, and Population Group

Table 15.5 presents results for two categories of schooling, namely the "no schooling" category and the "higher educational level," controlling for income by gender.

The results show that income levels within the same educational level and gender vary among the different population groups. Among Black African women, 47% of those with no schooling earned no income, compared to 28.7% among Indians/Asians. It was also observed that slightly more than one in three of the White (36.5%) and Coloured (36.8%) females without any schooling earned no income. Among males, Black African men have the highest proportion without income among those with no schooling. For both men and women, the majority of those who had some income earned less than R1601. The data further reveal that among those with higher education, a sizeable proportion did not earn any income. Also, the proportion of those who earned no income varied by both population group and gender (Figure 15.6).

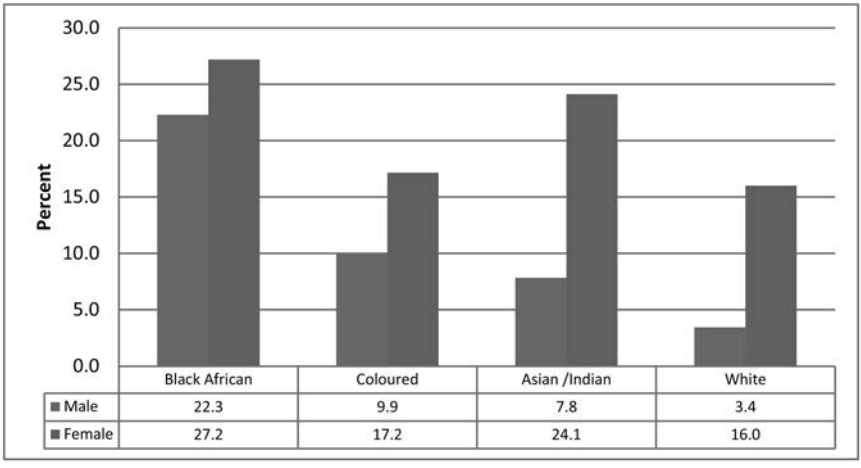


Figure 15.6 Proportion no income with higher educational level, CS 2007

Black Africans had the highest proportion of those without any income among the highly educated. The White population group, on the other hand, had the lowest proportion of those without income among the educated. Similarly, the gaps vary between men and women of the different population groups. The gap is widest among the Indian/Asian population (16.3%) and smallest among the Black African population group (4.9%).

3.11. Gender of the Household Head by Housing Conditions and Household Goods

In the CS 2007, there was a section on housing conditions and household goods. The subsequent analysis compares gender of the household head in relation to the profile of those conditions and goods. Also, three indicators, namely gender ratios, gender gaps, and relative gaps, have been calculated, as indicated in Table 15.6. The gender ratio, sometimes referred to as the gender parity index (GPI), measures the extent of inequality. The GPI ranges from 0 to 1, where 0 stands for perfect inequality and 1 stands for perfect equality. When computed as a percentage, it denotes the number of females per 100 males for any indicator under study. The gender ratio is similar to the sex ratio except that it emphasises the position of women relative to men. In this chapter, it was multiplied by 100 and is expressed per 100 men. On the other hand, the gender gap measures the magnitude of disparities. When computed from the population values, the results obtained are referred to as the absolute gap. The gap may be positive or negative, depending on whether inequality is in favour of males or females. When it is negative, it implies that it is in favour of men. When it is positive, then it is in favour of women. Zero implies that no inequality is observed. The relative gap measures the extent to which interventions are required or how much effort is required to achieve equality between men and women with respect to a particular indicator. A negative value implies that more is needed for women than men. Zero implies that no effort is required.

Table 15.6 further presents the difference between males and females. The first question within the housing section was on the type of dwelling unit. There are several dwelling types in South Africa, but these were summarised into four, namely formal, informal, traditional, and other. The proportion of type of dwelling by gender of the household head shows that the proportion living in a formal dwelling is the same for men (69.8%) and women (69.3%). The difference is observed between informal and traditional dwelling types. The proportion of females in traditional households was higher than that of males. About 16% of households headed by men lived in informal dwellings, compared to 12% of households headed by females.

One of the South African government's goals was the provision of electricity to all households by 2014. There were variations in the use of electricity by gender of the household head. Generally, more male-headed households had electricity than female-headed households. The gap between male- and female-headed households varies according to what electricity is used for.

Table 15.6 Housing and housing census by gender, Community Survey 2007

	Male	Female	Total	Gender Ratio	Gender Gap	Relative Gap
Type of dwelling						
Formal	69.8	69.3	69.6	99.3	–0.5	–0.7
Traditional	8.6	16.3	11.7	190.4	7.7	66.3
Informal	15.9	12.3	14.4	77.7	–3.5	–24.5
Other	5.8	2.0	4.3	35.4	–3.7	–87.3
Source of energy						
Lighting	81.3	78.3	80.1	96.3	–3.0	–3.7
Cooking	70.5	60.4	66.4	85.7	–10.1	–15.2
Heating	63.4	51.7	58.7	81.6	–11.6	–19.8
Electricity—all	61.4	49.7	56.7	80.9	–11.7	–20.7
Water						
Piped water	90.9	85.4	88.7	94.0	–5.5	–6.2
Piped water < 200m	78.1	69.5	74.6	89.0	–8.6	–11.5
Fridge	64.6	62.8	63.9	97.2	–1.8	–2.9
Garbage disposal						
Local authority	66.3	54.5	61.6	82.2	–11.8	–19.1
No rubbish disposal	6.3	8.4	7.1	132.8	2.1	29.0
Own disposal	27.4	37.1	31.3	135.4	9.7	31.0
Toilet facility						
Pit latrine	23.3	33.2	27.3	142.1	9.8	36.0
Bucket	2.2	2.2	2.2	100.0	0.0	0.0
No toilet	6.9	10.3	8.3	149.7	3.4	41.4
Other	67.6	54.4	62.3	80.4	–13.3	–21.3
Communication						
Cell phone	74.8	69.6	72.7	93.1	–5.2	–7.1
Landline	21.4	14.3	18.6	66.5	–7.2	–38.8
Telephone (Cell/& landline)	78.0	73.5	76.2	94.2	–4.5	–5.9
Radio	78.8	73.2	76.5	92.8	–5.7	–7.4
TV	67.4	62.8	65.5	93.2	–4.6	–7.0
TV/& radio	85.3	81.8	83.9	95.9	–3.5	–4.2
Computer	19.9	9.3	15.6	46.6	–10.6	–68.0
Internet	9.8	3.5	7.2	36.0	–6.3	–86.3
Post office box	43.4	35.0	40.0	80.8	–8.4	–20.9

Eight in ten of the South African households used electricity for lighting, with a gap of 3% between male and female households. When it comes to cooking, the gap increases to 10% among households using electricity for cooking and to 11.6% and 11.7% among those using electricity for heating and those using electricity for all three, namely lighting, heating, and cooking, respectively, all in favour of men. There was no significant difference between households having a refrigerator and the gender of the household head, though males were slightly higher, by 1.8%.

The government of South Africa's goal in relation to water was that there must be clean water within walking distance for all persons—specifically that all people in South Africa must have access to potable water by 2014. This goal is articulated as a minimum of 25 litres of potable water per person per day within a distance of 200 meters of a household and not interrupted for more than seven days in any year, with a minimum of 10 litres per year for communal water points. The CS 2007 did not provide information on the quantity of water, but it contained information on the main source of water for the household and also the distance to the main source of water. The analysis in this chapter was based on responses concerning piped water just as it appears in CS 2007. There was a gender gap of 5.5% in the availability of piped water between households headed by males and those headed by females. Further analysis showed that the gap becomes wider when households within the recommended distance of 200 m are considered—8.6% in favour of male-headed households.

Good sanitation is important for a healthy society. A comparison of male- and female-headed households shows that households headed by females are worse off with regard to garbage disposal facilities. More male-headed households have their garbage collected by the local authority, and a small proportion does not have any rubbish disposal compared to female-headed households.

Similarly, there are more female-headed households without a toilet facility compared to male-headed households. In addition, more female-headed households (33.2%) use toilets, compared to 23.3% of the male-headed households. The proportion of households using buckets is exactly the same for female-headed households as for male-headed households.

In relation to the availability of communication facilities in the households, those headed by women were more disadvantaged in all communication assets (properties) and services. The gender gap varied from 3.5% among households with either radio or TV to 10.6% among the households with computers.

4. CONCLUSION

Overall, there is no significant gender difference between males and females in South Africa. There has, however, been an overall improvement in education across all population groups between 1996 and 2007.

The sex ratio was highest in Mpumalanga and in the age group 30 to 34 years. The 30 to 34 age group corresponds to those born between 1972/73 and 1976/77. These were the years during the struggle against apartheid, which affected many children in the then undemocratic South Africa. In Mpumalanga, there is a possibility that there was also either much out-migration of females or in-migration of males. Since we know that population change is affected by three factors—birth, death, and migration—a retrospective study can be taken to ascertain why differences exist in numbers between men and women in this age group and also in Mpumalanga, with the highest sex ratio, relative to the Eastern Cape and those aged 55 to 59 with the lowest sex ratio.

The government of South Africa is on track to achieve the Millennium Development Goal in regard to gender disparity. Although disparities between men and women still exist, there were some improvements from 1996 to 2007. Furthermore, there are a number of areas in which women are doing better than men, such as in the achievement of higher educational qualifications, and no difference between men and women with a completed primary education was observed. Policies in South Africa should ensure that these trends continue. Anecdotal evidence may be that among those with higher levels of education, the qualifications may represent skills which cannot easily be applied in the labour market. It is thus worthwhile that unemployment or not working should be compared to what skills individuals who are educated possess. The data are limited, as they do not allow us to understand specific qualifications, especially at higher levels. This can help to differentiate between which qualifications females obtain most and what their male counterparts get, as this may explain income differentials.

At every level, the proportion of those working was higher for males compared to females. Furthermore, the proportion of those working increases as the educational level attained increases. Little education for females makes them less able to get employment, especially those who completed only primary education. However, fewer women than men are working and are earning less than men in terms of income from employment. Differences in income may be due to specific qualifications rather than gender differences, although women still earn less income, given the same educational level, compared to men.

From the analysis, it was also observed that the proportion of women working increased at a faster rate than that of men. If this trend continues, the gender gap in employment will shrink considerably within a period of 10 to 15 years from the time of the community survey if all other factors remain constant, including the government policies on affirmative action. There is a lower proportion of female Indians/Asians working among those with no education or low educational attainment. This trend reverses at secondary and higher educational levels. At high levels of educational attainment, the proportion of Blacks working declines compared to other population groups. The low level of working Indian/Asian women without

any level of education raises the issues of economic empowerment. It shows that women with little education are not being empowered like their counterparts with higher education. There is a need for a policy on adult education tailored for providing skills to especially the Indian/Asian and Black African women.

Population group analysis shows that the proportion of White females working was higher than that of Black African males. This difference can be explained by the differences in educational attainment. The majority of Black African males do not have qualifications that can be compared to those held by White females. This finding reiterates the need for educational opportunities for Black men or making the policy flexible for special cases in order for men not to be left out. The analysis shows that women scored highly in areas which are poor, for example more women in traditional dwelling units, more women in households with no toilets or those with pit latrines, and more women who do their own garbage disposal. The gender ratio, the gender gap, and the relative gap on all communication show that women's access to information is limited compared to men's. The limitation on access to information places women in a disadvantaged position, as many opportunities would pass them by.

Variations in income were explained by gender, population, and geographical location. This explains why these factors were important and selected for this analysis.

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Index