

Characterizing the

HIV/AIDS

Epidemic in the Middle East
and North Africa

TIME FOR STRATEGIC ACTION

Laith J. Abu-Raddad, Francisca Ayodeji Akala,
Iris Semini, Gabriele Riedner, David Wilson,
and Ousama Tawil



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Executive Summary

Despite a fair amount of progress on understanding human immunodeficiency virus (HIV) epidemiology globally, the Middle East and North Africa (MENA) region is the only region where knowledge of the epidemic continues to be very limited, and subject to much controversy. It has been more than 25 years since the discovery of HIV, but no scientific study has provided a comprehensive data-driven synthesis of HIV/AIDS (acquired immunodeficiency syndrome) infectious spread in this region. The region continues to be viewed as the anomaly in the HIV/AIDS world map and “a real hole in terms of HIV/AIDS epidemiological data.”¹

This report addresses this dearth of strategic information on HIV infections in MENA through a joint effort of the World Bank, the MENA Regional Support Team (RST) of the Joint United Nations Programme on HIV/AIDS (UNAIDS), and the Eastern Mediterranean Regional Office (EMRO) of the World Health Organization (WHO). It builds on a series of publications by the World Bank that focuses on different aspects of HIV/AIDS epidemic and response. In 2003, the World Bank, in collaboration with UNAIDS and WHO/EMRO, issued the *HIV/AIDS in the Middle East and North Africa: The Cost of Inaction* report, which provided an analysis of the vulnerability factors in MENA along with an economic analysis of the impact based on the limited HIV data recognized at the time. In 2005, the World Bank issued the *Preventing HIV/AIDS in the Middle East and North Africa: A Window of Opportunity to Act* report, which provided an analysis of a prevention strategy for HIV in MENA. The current report provides the first comprehensive scientific assessment and data-

driven epidemiological synthesis of HIV spread in MENA since the beginning of the epidemic. It is based on a literature review and analysis of thousands of widely unrecognized publications, reports, and data sources extracted from scientific literature or collected from sources at the local, national, and regional levels.

For the purpose of an epidemiologically relevant classification, the MENA population has been divided into different risk classes. The first class includes the **priority groups** that are at the highest risk of HIV infection. These groups include injecting drug users (IDUs), men who have sex with men (MSM), and female sex workers (FSWs). The second class includes the **bridging populations**, such as clients of sex workers, who experience an intermediate risk of HIV infection and provide links between priority groups and the general population. The **general population**, the third risk class, experiences the lowest risk of HIV infection and includes most of the population in any community. It also includes the **vulnerable populations** that are generally at low risk of HIV infection, such as prisoners, youth, and mobile populations, but are vulnerable to practices that may put them at higher risk of HIV infection.

This report covers all countries that are included in the definition for the Middle East and North Africa Region at the World Bank, UNAIDS MENA RST, and WHO/EMRO. Explicitly, this report includes data on Afghanistan, Algeria, Bahrain, Djibouti, the Arab Republic of Egypt, the Islamic Republic of Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Somalia, Sudan, the Syrian Arab Republic, Tunisia, the United Arab Emirates, West Bank and Gaza (Occupied Palestinian Territories), and the Republic of Yemen.

¹ Bohannon, “Science in Libya.”

KEY FINDINGS

HIV epidemics in MENA

HIV infection has already reached all corners of MENA and the majority of HIV infections are occurring in the existing sexual and injecting drug risk networks. The region as a whole is failing to control HIV spread along the contours of risk and vulnerability despite promising recent efforts. Priority populations, including IDUs, MSM, and FSWs, are documented to exist in all MENA countries. IDUs and MSM and their sexual partners, along with commercial sex networks, are the MENA populations most impacted by HIV/AIDS. In this sense, MENA is not an anomaly to the global HIV transmission patterns apart from the general population epidemics in sub-Saharan Africa.

There is substantial heterogeneity in HIV spread across MENA and different risk contexts are present throughout the region. However, the HIV epidemic in MENA can be roughly classified, in terms of the extent of HIV spread, into two groups. The first is the group of considerable HIV prevalence, which includes Djibouti, Somalia, and Southern Sudan, and is labeled here as the **Subregion with Considerable Prevalence**. The second group, which includes the rest of the MENA countries, has a more modest HIV prevalence and is labeled here as the **Core MENA Region**. Because the latter group consists of most of the MENA countries, HIV epidemiology here represents the main patterns found in MENA.

HIV epidemic typology in the Core MENA Region

Two epidemiologic patterns describe HIV epidemiology in this group of MENA countries. The first is the pattern of **exogenous HIV exposures** among the nationals of these countries, or HIV infections among their sexual partners upon their return. This pattern exists in all MENA countries at some level or another, but appears to be also the dominant pattern in several MENA countries. The weak surveillance systems of priority populations prevent us from conclusively stating whether this is indeed the dominant or only epidemiologic pattern in these countries. HIV could be spreading among some of the priority groups, or within pockets of these populations, without public awareness

of this endemic spread. However, there is no evidence to date that such considerable endemic transmission exists in these countries.

The second pattern in several MENA countries is that of concentrated HIV epidemics among priority populations. A concentrated epidemic is defined as an epidemic with an HIV prevalence consistently exceeding 5% in a priority population. There is already documented evidence for concentrated epidemics among IDUs in several MENA countries and considerable evidence suggesting concentrated epidemics among MSM. There is no evidence for the existence of major concentrated epidemics among FSWs. All evidence indicates no HIV epidemic among the general population.

HIV epidemic typology in the Subregion with Considerable Prevalence

Djibouti, parts of Somalia, and Southern Sudan are in a state of generalized HIV epidemics. A generalized HIV epidemic is defined as an epidemic with an HIV prevalence consistently exceeding 1% among pregnant women. Most HIV infections in these countries, however, are concentrated in priority groups and bridging populations. HIV dynamics are focused around commercial sex networks in settings where the size of the commercial sex network is large enough to support an epidemic with a prevalence exceeding 1% in the population.

There is no evidence of sustainable general population HIV epidemics in this group of MENA countries. Nevertheless, Southern Sudan is of particular concern. There are insufficient data to satisfactorily characterize HIV epidemiology in this part of Sudan, and it could be already in a state of general population HIV epidemic.

HIV spread and risk behavior by risk group

Injecting drug users

Injecting drug use is a persistent and a growing problem in MENA, with 0.2% of the total MENA population, almost a million people, injecting drugs. MENA is a major source, route, and destination for the global trade in illicit drugs.

HIV has already established itself among a number of IDU populations in MENA, while it is still at low or nil prevalence in other

populations. Levels of HIV prevalence among populations where the infection is already established are comparable to those observed in other regions.

Levels of risk behavior practices, such as using nonsterile injecting equipment, are generally high, confirming the potential for further HIV spread among IDUs. Levels of hepatitis C virus (HCV), a marker of using nonsterile injecting equipment, are in the intermediate to high range, also confirming the potential for further HIV spread. IDUs are sexually active and report high levels of sexual risk behavior, indicating substantial overlap of risks among the three priority groups of IDUs, MSM, and FSWs. Levels of comprehensive HIV knowledge among IDUs vary across the region, with both high and low levels being reported in different settings.

The IDU risk context suggests the possibility of further concentrated HIV epidemics among IDUs in MENA over the next decade. The low or nil HIV prevalence in a number of IDU populations appears to reflect lack of HIV introduction into these populations, or that it has only recently been introduced, or the nature injecting network structure among the IDUs.

There is an urgent need for HIV surveillance to better understand transmission dynamics, risk behavior practices, and population estimates so that this information can be used to plan and implement more effective prevention and care services for IDUs. There is an opportunity to prevent IDU epidemics in MENA through needle exchange programs, access to frequent testing, prevention of heroin uptake, safe sex messages, and condom distribution.

Men who have sex with men

MSM are the most hidden and stigmatized risk group of all HIV risk groups in MENA. Nevertheless, homosexuality is prevalent at levels comparable to those in other regions, with a few percentage points of the male population engaging in homosexual contacts.

HIV is spreading among MSM, with apparently a rapidly rising epidemic in at least one country (Pakistan). HIV prevalence among MSM is already at considerable levels in several other countries, but data are still too limited to confirm the trend.

MSM report high levels of sexual risk behavior, such as multiple sexual partnerships of different kinds, low condom use, and high prevalence of sex work. MSM risk behaviors overlap considerably with heterosexual sex and injecting drug risk behaviors. Prevalence levels of sexually transmitted infections (STIs) other than HIV are substantial, suggesting epidemic potential for HIV. Levels of comprehensive HIV knowledge among MSM vary across the region with, both high and low levels being reported in different settings.

The MSM risk context suggests the possibility of concentrated HIV epidemics among MSM in MENA over the next decade. Indeed, MENA may already be in a stage of concentrated HIV epidemics among MSM in several countries, but definitive and conclusive data are lacking to support this possibility.

There is urgent need for HIV surveillance to better understand the transmission dynamics among MSM so that this information can be used to plan and implement more effective prevention and care services for this population group in MENA. Expansion of prevention and treatment efforts for MSM, such as condom distribution, counseling, HIV testing, HIV and STI treatment, and social and medical services, is key to preventing considerable HIV epidemics among MSM.

Commercial sex networks

Commercial sex is prevalent all over MENA, although levels are rather low in comparison to other regions. Economic pressure, family disruption or dysfunction, and political conflicts are major pressures for commercial sex in this region. Roughly 0.1% to 1% of women appear to exchange sex for money or other commodities, and a few percentage points of men report sexual contacts with FSWs. Accordingly, commercial sex networks are the largest of the three priority group networks in MENA.

HIV prevalence continues to be at low levels among FSWs in most countries, although at levels much higher than those in the general population. HIV spread does not appear to be well established in many commercial sex networks in the region. In three countries, however, namely Djibouti, Somalia, and Sudan, HIV prevalence among some FSW groups has reached high

levels, indicating concentrated HIV epidemics in at least parts of these countries. Nevertheless, HIV prevalence among FSWs in these countries is at lower levels than those found in hyperendemic HIV epidemics in sub-Saharan Africa.

FSWs report considerable levels of sexual risk behavior, including roughly one client per calendar day; low levels of condom use, particularly in areas of concentrated HIV epidemics among FSWs; anal and oral sex in addition to vaginal sex; having clients or sexual partners who inject drugs; and injecting drugs themselves. Considerable levels of STI prevalence other than HIV are found among FSWs. STD (sexually transmitted disease) clinic attendees repeatedly report acquiring STDs through paid sex. Levels of comprehensive HIV knowledge among FSWs vary across the region, with both high and low levels being documented in different settings.

There is a potential for further HIV spread among FSWs, but probably not at high levels in most countries, except possibly for Djibouti, Somalia, and Sudan. Near universal male circumcision, with its efficacy against HIV infection, and the rather lower risk behavior compared to other regions, may prevent massive or even concentrated HIV epidemics among FSWs from materializing in most countries in MENA for at least a decade, if ever, should these conditions persist.

Yet, HIV prevalence among FSWs will be at levels much higher than those of the general population. Subgroups within FSWs may be particularly at high risk of HIV, such as those who inject drugs, have clients who inject drugs, female IDUs who exchange sex for money or drugs, as well as FSWs with low socioeconomic status who have poor HIV knowledge or are not able to afford or negotiate condom use.

FSWs need prevention and care services not only because of HIV infection, but also because of the considerable levels of other STIs in their population. Dedicated STI services for FSWs need to be established, and in settings where they are already established, they need to be expanded.

Potential bridging populations

A sizable fraction of MENA populations belong to what could be labeled as *potential bridging populations*, such as clients of sex workers, other sexual partners of priority populations, truck

drivers, fishermen, and military personnel. Evidence on HIV prevalence, other STI prevalence, sexual risk behavior measures, and drug-injecting practices among potential bridging populations remains rather limited. Existing evidence suggests considerable levels of sexual risk behavior among potential bridging populations, but still limited HIV prevalence, except possibly for Djibouti, Somalia, and Sudan.

The limited HIV prevalence among potential bridging populations is probably a consequence of the low HIV prevalence among FSWs and the high coverage of male circumcision among men. In this sense, these populations are not key contributors to the dynamics of HIV infectious spread in MENA and are not effectively bridging populations capable of spreading the infection further to the general population.

An important characteristic of HIV in MENA is the role of the sexual partners of priority populations: they are shouldering a sizable proportion of HIV disease burden, but they rarely transmit the infection further. Women are especially vulnerable because most risk behaviors are practiced by men. HIV prevention efforts in MENA should address this key vulnerability.

General population

HIV prevalence in the general population is at very low levels in all MENA countries, apart from Djibouti, Somalia, and Sudan. There is no evidence of a substantial HIV epidemic in the general population in any of the MENA countries.

Sexual behavior data in the general population in MENA remain rather limited. Existing evidence suggests that sexual risk behaviors are present, but at rather low levels in comparison to other regions. However, levels of sexual risk behavior appear to be increasing, particularly among youth, though probably not to a level that can support an HIV epidemic in the general population. Available sexual risk behavior measures suggest limited potential for a sustainable HIV epidemic in the general population in at least the foreseeable future, if ever, should these conditions persist.

STI prevalence data, including herpes simplex virus type 2 (HSV-2), human papillomavirus (HPV), syphilis, gonorrhea, and chlamydia, indicate low prevalence of these infections among the general population in MENA in comparison to other regions. Unsafe abortions are also at

low levels in MENA compared to other regions. These proxy measures of sexual risk behavior imply low levels of risk behavior in the general population and further indicate limited potential for a sustainable HIV epidemic in this part of the population.

Male circumcision is almost universal in MENA and is associated with a strong biological efficacy against HIV infection. This further indicates limited potential for a sustainable HIV epidemic in the general population.

In the other regions around the world, there is no evidence for a sustainable general population HIV epidemic apart from parts of sub-Saharan Africa. It is inconceivable that the MENA region will be the exception to this pattern after consistently very low HIV prevalence in the general population for over two decades since the virus' introduction into MENA in the 1980s. Considering all the evidence reviewed for this report, it is unlikely that the HIV epidemic in MENA will take a course similar to that in sub-Saharan Africa if the existing social and epidemiological context in the region remains largely the same. At most, the region may face up to a few percentage points prevalence in the population of several of its countries. **Still, this would be an immense disease burden and subsequent economic burden in a region that is mostly unprepared for such an epidemic.**

A major unknown in the understanding of the HIV epidemiology in the general population in MENA is that of the levels of recent increases, and future trends, in risk behaviors, particularly among youth. If the increases in risk behavior are substantial, this could put some aspects of the analytical view of the dynamics in question. The trajectory of the HIV epidemic may be different and possibly result in substantial HIV epidemics in MENA populations. Studying the levels of risk behaviors and STI incidence among youth should be a priority for scientific research in MENA.

RECOMMENDATIONS

The recommendations provided here focus on key strategies related to the scope of this report and its emphasis on understanding HIV epi-

miology in MENA as a whole. The recommendations are based on identifying the status of the HIV epidemic in MENA, through this synthesis, as a **low HIV prevalence setting with rising concentrated epidemics among priority populations**. General directions for prevention interventions as warranted by the outcome of this synthesis are also discussed briefly, but are not delineated because they are beyond the scope of this report. This report was not intended to provide intervention recommendations for each MENA country.

Recommendation 1: Increase and expand baseline and continued surveillance

The analytical insights drawn here from a synthesis of thousands of studies and data sources indicate that there is no escape from the necessity of developing robust surveillance systems to monitor HIV spread among priority populations. Inadequate and limited HIV epidemiological and methodological surveillance continue to be one of the most pervasive problems in this region. Effective and repeated surveillance of IDUs, MSM, and FSWs is key in MENA countries to definitively conclude whether HIV spread is indeed limited in priority populations, and to detect epidemics among these groups at an early stage.

Surveillance work should include the mapping of risk and vulnerability factors, risk behavior measures, population size estimations, and, importantly, measurements of HIV prevalence and risk biomarkers, such as STI and HCV prevalence levels. This would offer a window of opportunity to target prevention at an early phase of an epidemic. Monitoring recent infections and examining the nature of exposures could also be useful in detecting emerging endemic transmission chains within MENA populations.

An approach of integrated biobehavioral surveillance surveys (IBBSS) among representative priority populations should be the main component of surveillance efforts, rather than reliance on facility-based surveillance using convenient population samples that are not capturing the dynamics of HIV transmission in MENA. Resources should not be wasted on surveillance among low-risk populations while overlooking HIV spread in priority populations.

Recommendation 2: Expand scientific research and formulate evidence-informed policies

The data synthesis in this report highlights the large gap in methodological scientific research in relation to HIV and other STI epidemiology in MENA. The limited human and financial resources are key challenges in most countries, and these constraints are preventing the region from formulating effective and evidence-informed policies.

The first research priority should be to conduct repeated, multicenter IBBSS studies on priority groups to monitor trends, combining HIV sero-surveillance with STI, HCV, and risk behavior surveillance. These studies also need to explore the network structures among these risk groups, including both sexual and injecting drug networks.

The second priority is research on mapping and size estimation of hard-to-reach priority populations, which are essential for the quantitative assessments of HIV epidemiology and trends, and would help in planning sufficient and more effective prevention strategies and programs.

The third priority is to conduct multicenter cohort or cross-sectional studies among vulnerable populations, such as the youth, to assess trends of HIV and other STI incidence, other infectious disease incidence such as HCV, sexual and injecting drug use risk behaviors, and drivers of risky behavior. With the high rates of population mobility in MENA, it is also a priority to assess levels of risk behavior and infection among migrants because data on this population remain limited, although the socioeconomic context of migration in this region may predispose this population to risky behavior practices.

The fourth priority is to conduct mathematical modeling and cost-effectiveness studies to explore the full range of the complex HIV dynamics and predict intervention impacts in MENA. These studies would build inferences and suggest policy recommendations by using the individual and population level data that will become increasingly available over the next few years from surveillance studies on priority populations.

Recommendation 3: Focus on risk and vulnerability, not on law enforcement

The HIV transmission patterns delineated in this report show that HIV spread is merely a reflec-

tion of existing contours of risk and vulnerability in the societies in which it is spreading. HIV cannot be addressed fundamentally except by addressing the underlying causes of these risks and vulnerabilities. HIV spread is not a question of law enforcement to prevent risky behavior. Repressive measures will only complicate prevention efforts and push risky behavior further underground, making it even more difficult to reach these groups with programs. This would not change the vulnerability settings but would deprive MENA governments and their partners from the ability to prevent the epidemic and administer prevention interventions as needed. The “security” approach to HIV policy has already led to documented failures in controlling HIV spread in MENA countries.

Policies, programs, and resources continue to be diverted from where they are needed. The mandatory testing of many population groups at low risk of HIV infection, such as the general population, which is the practice in the region, is disconnected from the epidemiological reality of HIV infection in the region. Some of this testing may also violate basic human rights and is likely not effective from a public health perspective. Efforts need to be prioritized to the contours of risk and vulnerability and focus on priority groups. Recognizing the settings of risks, and implementing effective, evidence-informed interventions, is the only available path for controlling HIV spread in MENA.

Recommendation 4: Strengthen civil society contributions to HIV efforts

A structural weakness of the HIV response in MENA is the meager contribution of nongovernmental organizations (NGOs), community organizations, and people living with HIV (PLHIV) groups in the formulation, planning, and implementation of the response. Strengthening civil society contributions to HIV efforts is essential given the epidemiological reality of HIV transmission being concentrated among largely hidden and stigmatized priority populations, as documented by this synthesis.

There is no escaping the fact that grassroots NGOs need to be developed within the MENA region to support the HIV response. NGOs may be able to help governments deal with priority

groups indirectly, thereby avoiding cultural sensitivities in explicit outreach efforts for stigmatized populations. Discreet interventions for HIV prevention have already proven effective in a number of MENA countries.

Recommendation 5: An opportunity for prevention

There is still an open window of opportunity for MENA to control the HIV epidemic. HIV programs involving the general population should stress stigma reduction, while prevention efforts should be focused on priority populations that are at increased risk of HIV infection. Interventions need to capitalize on the strengths represented by cultural traditions, as well as be culturally sensitive, while fostering effective responses to the epidemic. Access to testing, care, and treatment services must be expanded substantially. To impede future HIV transmission, it is imperative to remove all barriers to HIV testing and diagnosis, particularly among priority groups.

There is a need to invest in a comprehensive analysis of the current gaps in the HIV response as well as the promising opportunities. This can be accomplished by combining transmission mode analysis in each country with the mapping of current interventions, including a taxonomy of prevention.

Although countries need to address the structural factors that drive risky behavior

practices, the priority in the public health sector should be on addressing the direct factors that put individuals at risk of HIV exposure. Since almost all infections occur when an infected individual shares body fluids with an uninfected individual, prevention programs must focus on addressing the situations in which this is happening. Careful analysis of transmission patterns must be conducted to inform policy decisions.

Beyond doubt, *harm reduction* should be at the core of intervention policy, although targeted prevention should go further than harm reduction. The concept of harm reduction should be applied not only to IDUs, but should also be considered for MSM and FSWs. Harm reduction is the most direct and effective strategy to stem the tide of HIV, considering that addressing the root causes of risks and vulnerabilities might be a much more challenging task. The Islamic Republic of Iran has already paved the way by showing how harm reduction can be implemented within the cultural fabric of MENA and in consonance with religious values.

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Key Definitions and Abbreviations

KEY DEFINITIONS

Bridging populations

Bridging populations are populations at intermediate risk of exposure to HIV and provide links between the high-risk priority populations and the low-risk general population. Conventionally, bridging populations include groups such as truck drivers, military personnel, sailors, and sexual partners of IDUs, FSWs, and MSM.

General population

The general population is the part of the population that is at relatively low risk of HIV exposure and encompasses most of the population in any community. It is strictly defined here as the total population not belonging to priority or bridging populations.

Priority populations

Priority populations are populations that experience the highest probability of being exposed to HIV infection. Priority populations include IDUs, MSM (including MSWs), and FSWs.

Vulnerable populations

Vulnerable populations form a subset of the general population and generally are at low risk of HIV exposure but are vulnerable to practices that may put them at a higher risk of HIV infection. Vulnerable populations include prisoners, youth, and mobile populations. Once these vulnerable populations adopt higher-risk practices, they become part of the priority or bridging populations.

ABBREVIATIONS

AIDS	Acquired immunodeficiency syndrome
ANC	Antenatal clinic
ART	Antiretroviral therapy
ARV	Antiretroviral
ASR	Age-standardized rates
DHS	Demographic and Health Survey
ELISA	Enzyme-linked immunoassay
EMRO	Eastern Mediterranean Regional Office (World Health Organization)
FBO	Faith-based organization
FHI	Family Health International
FSW	Female sex work(er)
GFATM	Global Fund to Fight AIDS, Tuberculosis, and Malaria
GONGO	Government organized nongovernmental organizations
GST	Group of sustainable transmission
GUD	Genital ulcer disease
HBV	Hepatitis B virus
HCV	Hepatitis C virus

HCWs	Health care workers
HIV	Human immunodeficiency virus
HPV	Human papillomavirus
HSV-1	Herpes simplex virus type 1
HSV-2	Herpes simplex virus type 2
HSW	<i>Hjira</i> sex worker
IARC	International Agency for Research on Cancer
IEC	Information, Education, and Communication
IBBSS	Integrated biobehavioral surveillance survey
ICPS	International Centre for Prison Studies
IDPs	Internally displaced persons
IDU	Injecting drug use(r)
INCAS	Iranian National Center for Addiction Studies
IOM	International Organization for Migration
KAP	Knowledge attitudes and practices
MENA	Middle East and North Africa
MENAHRA	MENA Harm Reduction Association
MeSH	Medical subheading
M&E	Monitoring and evaluation
MMT	Methadone maintenance treatment
MOH	Ministry of health
MSM	Men who have sex with men
MSW	Male sex work(er)
NGO	Nongovernmental organization
NSNAC	New Sudan National AIDS Council
NSP	National strategic plan
NSP	Needle and syringe program
OST	Opioid substitution therapy
PITC	Provider initiated testing and counseling
PLHIV	People living with HIV
PMTCT	Prevention of mother-to-child transmission
PRB	Population Reference Bureau
RSA	Rapid situation assessment
RST	Regional Support Team
RTI	Reproductive tract infection
SAR	South Asia Region
SNAP	Sudan National AIDS Programme
STD	Sexually transmitted disease
STI	Sexually transmitted infection
TB	Tuberculosis
UN	United Nations
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
UNODC	United Nations Office on Drugs and Crime
UNRWA	United Nations Relief and Works Agency for Palestine Refugees in the Near East
USAID	United States Agency for International Development
VCT	Voluntary counseling and testing
WBA	Western blot assays
WHO	World Health Organization

Characterizing the HIV/AIDS Epidemic in the Middle East and North Africa: Why and How?

BACKGROUND AND RATIONALE FOR THIS REPORT

The human immunodeficiency virus (HIV) pandemic continues as one of the most devastating health crises ever. The Joint United Nations Programme on HIV/AIDS (UNAIDS) and the World Health Organization (WHO) estimate that 35,000 (24,000–46,000) people were infected with HIV within the UNAIDS definition of the Middle East and North Africa (MENA) region¹ in 2008.² This brings the total number of people living with HIV (PLHIV) in MENA to 310,000 (250,000–380,000).³ It is also estimated that 20,000 (15,000–25,000) people died of HIV-related causes in 2008.⁴ In appendix A, table A.1 lists the estimated number of PLHIV in a number of MENA countries.

Despite much progress on understanding HIV epidemiology globally, MENA stands out as the only region where knowledge of the epidemic continues to be very limited and subject to much controversy.⁵ More than 25 years since the discovery of the HIV virus, no scientific study has provided a comprehensive data-driven synthesis of the HIV infectious spread in this region. The region continues to be viewed as the

anomaly in the HIV/AIDS (acquired immunodeficiency syndrome) world map and “a real hole in terms of HIV/AIDS epidemiological data.”⁶

This report addresses this dearth of strategic information on HIV infections in MENA through a joint effort by the World Bank, the MENA Regional Support Team (RST) of UNAIDS, and the Eastern Mediterranean Regional Office (EMRO) of WHO. It builds on a series of publications by the World Bank that focus on different aspects of the HIV/AIDS epidemic and response. In 2003, the World Bank, in collaboration with UNAIDS and WHO/EMRO, issued the *HIV/AIDS in the Middle East and North Africa: The Cost of Inaction* report, which provided an analysis of the vulnerability factors in MENA along with an economic analysis of the impact based on the limited HIV data at the time. In 2005, the World Bank issued the *Preventing HIV/AIDS in the Middle East and North Africa: A Window of Opportunity to Act* report, which provided an analysis of a prevention strategy for HIV in MENA. This current report provides the first comprehensive scientific assessment and data-driven epidemiological synthesis of HIV spread in MENA since the beginning of the epidemic. It is based on a literature review and the analysis of thousands of widely unrecognized publications, reports, and data sources extracted from the scientific literature or collected from sources at the local, national, and regional levels.

¹ Excluding Afghanistan, the Islamic Republic of Iran, and Pakistan.

² UNAIDS and WHO, *AIDS Epidemic Update 2009*.

³ Ibid.

⁴ Ibid.

⁵ Obermeyer, “HIV in the Middle East.”

⁶ Bohannon, “Science in Libya.”

Just as in other regions, MENA has several vulnerability factors for HIV. The process of modernization, including mass education and urbanization, known to occur with the abandonment of traditional patterns of behavior,⁷ continues in MENA at full throttle. Most countries are experiencing diverse influences including changing family structures, exposure to different cultures, openness of the market, tourism, and enhanced communication and technology, such as satellite television and the Internet.⁸ There is a sociocultural transition leading to more tolerance and acceptance of behaviors such as premarital and extramarital sex and increased opportunities for sexual partnerships beyond traditional forms.⁹ The cultural tradition of balancing premarital chastity with early marriage is no longer the norm.¹⁰ Social and gender tensions have been exacerbated by the clashing forces of traditional culture and modern culture.¹¹ There are numerous strains in preserving traditional values during the modernization of society, leading to a communication discrepancy as well as social tension at the community and family levels.

The social determinants of health in terms of political conflict, limited resources, and gender inequity continue to challenge the region.¹² Denial that HIV exists or is an important challenge remains widespread. Priority groups, including injecting drug users (IDUs), female sex workers (FSWs), and men who have sex with men (MSM), are highly stigmatized and lack access to comprehensive and confidential services. Community organizations serving at-risk populations are emerging, but are insufficient to meet current needs and are not well coordinated. Health promotion approaches remain didactic and prescriptive, are divorced from behavioral theory, and are nonparticipatory. There is a lack of evidence-based policies that can guide effective interventions. HIV response in MENA is an amalgam of moralism, pragmatism, and political

and regime sensitivities. In the absence of data-driven policies, the HIV response will continue to be beset by numerous challenges.

MENA is distinctively characterized by a “tidal wave” youth bulge; one-fifth of the population, 95 million people,¹³ is in the 15–24 years age group,¹⁴ the normal age range of initiation of sexual activities.¹⁵ Extensive levels of migration, displacement, and mobility exist in MENA, which has the highest number of refugees and internally displaced persons in the world.¹⁶ MENA is flooded with inexpensive drugs due to high levels of heroin production in Afghanistan and major drug trade routes that pass through the region.¹⁷ MENA suffers from the high prevalence of unnecessary medical injections and blood transfusions, the reuse of needles and syringes, occupational injuries of health care workers (HCWs), and skin scarifications,¹⁸ suggesting a potential for considerable parenteral HIV transmissions beyond injecting drug use.

The apparent lack of HIV data has fueled an intense, but unnecessary, polemical debate on the status of the epidemic in MENA.¹⁹ Some argued that adherence to cultural values provides “cultural immunity” against HIV spread and that MENA is immune to HIV through its fabric of “moral prophylaxis,” including strong prohibitions against premarital and extramarital sex, homosexuality, and alcohol and drug use.²⁰ Meanwhile, others argued that there is a public health crisis “behind the veil” and that the failure to combat the disease stems from cultural traditions slowing, if not freezing, the ability of MENA societies to deal with the epidemic.²¹ This

⁷ Carael, Cleland, and Adeokun, “Overview and Selected Findings.”

⁸ Busulwa, “HIV/AIDS Situation Analysis Study”; Mohammad et al., “Sexual Risk-Taking Behaviors”; Abukhalil, “Gender Boundaries and Sexual Categories in the Arab World.”

⁹ Busulwa, “HIV/AIDS Situation Analysis Study.”

¹⁰ Mohammad et al., “Sexual Risk-Taking Behaviors.”

¹¹ Abukhalil, “Gender Boundaries and Sexual Categories in the Arab World.”

¹² Shaar and Larenas, “Social Determinants of Health.”

¹³ Assaad and Roudi-Fahimi, “Youth in the Middle East and North Africa.”

¹⁴ UNAIDS, “Notes on AIDS in the Middle East and North Africa”; Roudi-Fahimi and Ashford, *Sexual & Reproductive Health*.

¹⁵ Roudi-Fahimi and Ashford, *Sexual & Reproductive Health*.

¹⁶ UNAIDS, “Notes on AIDS in the Middle East and North Africa.”

¹⁷ UNODC, *World Drug Report*.

¹⁸ Khawaja et al., “HIV/AIDS and Its Risk Factors in Pakistan”; World Bank Group, *World Bank Update 2005*; Yerly et al., “Nosocomial Outbreak”; Khattab et al., “Report on a Study of Women Living with HIV”; Burans et al., “Serosurvey of Prevalence of Human Immunodeficiency Virus”; Zafar et al., “Knowledge, Attitudes and Practices”; Hossini et al., “Knowledge and Attitudes”; Yemen MOH, *National Strategic Framework*; Kennedy, O’Reilly, and Mah, “The Use of a Quality-Improvement Approach.”

¹⁹ Obermeyer, “HIV in the Middle East.”

²⁰ Khawaja et al., “HIV/AIDS and Its Risk Factors in Pakistan”; Gray, “HIV and Islam”; Lenton, “Will Egypt Escape the AIDS Epidemic?”

²¹ Kelley and Eberstadt, “Behind the Veil”; Kelley and Eberstadt, “The Muslim Face of AIDS.”

view also stresses that if leaders continue to ignore the problem, HIV/AIDS could debilitate or even destabilize some of MENA societies by its drastic effects on morbidity, mortality, and economic productivity among the 15 to 49 years age group.²² Neither of these views has been substantiated by the epidemiological data synthesized in this report and both are far from the reality of HIV spread in MENA.

Objective and scope of report

The main objective of this report is to address the dearth of strategic information on HIV in MENA by delineating an evidence-based and data-driven overview of HIV epidemiology and an integrated analysis of HIV transmission trends and dynamics in this region. This report describes the major characteristics and the levels of HIV spread in diverse groups of MENA populations. It also identifies priority population groups with elevated HIV prevalence or risk factors and examines the major explanations for such variations in HIV transmission. The synthesis explores the epidemic potential for further HIV spread by contrasting HIV transmission, risk patterns, and trends in different HIV risk groups.

The ultimate goal of this synthesis is to provide the scientific evidence necessary for strategic prioritization; resource allocation and coverage; and effective, high-quality interventions. To this end, the authors have critically reviewed and interpreted data and studies on HIV/AIDS, sexual and injecting drug risk behaviors, vulnerability settings, sexually transmitted infections (STIs), and hepatitis C virus (HCV).

This report is concerned with an overview of HIV epidemiology in the region as a whole as opposed to country-level analyses. It is not part of the scope of this report to provide intervention recommendations for each MENA country.

CONCEPTUAL FRAMEWORK AND RESEARCH METHODOLOGY

This report uses an evidence-based and data-driven approach to characterize HIV epidemiology and dynamics in the MENA region. The

theme of this approach is the synthesis and integrated analysis of multiple sources of data, examined side by side, including biological data, risk behavior data, and proxy measures. The authors examined information collected by different methods, by different groups, and in different populations, and corroborated the conclusions across datasets, thereby minimizing the impact of potential biases that can exist in a single study, dataset, or line of evidence. This approach is especially suited for MENA considering the lack of representation and methodological rigor in a large number of studies.

Conceptual framework for HIV epidemiology

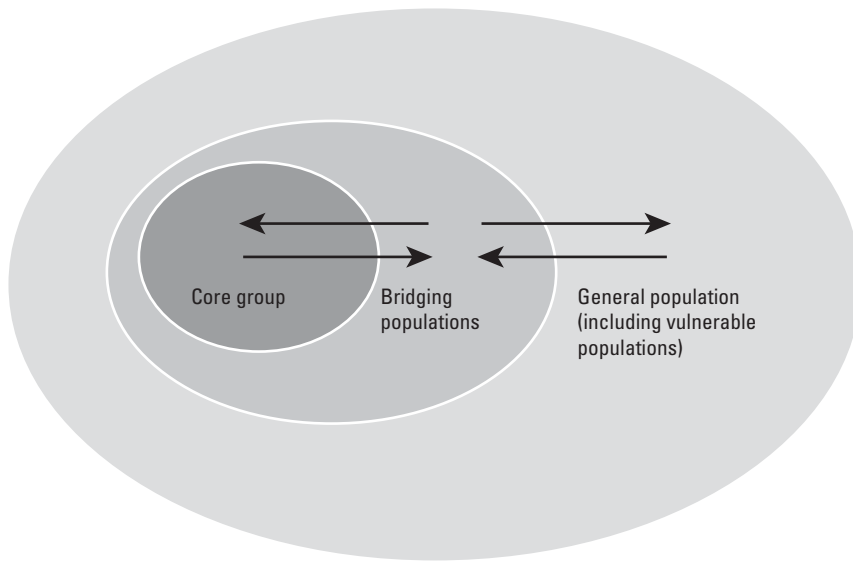
The risk of HIV infection depends on the transmission mode, HIV prevalence, and the behavioral attributes of the population. Human populations exhibit widely variable sexual and injecting drug risk behaviors, a heterogeneity in risk conventionally conceptualized in terms of three population groupings²³ (figure 1.1). The first is the core group, which experiences the highest risk of exposure to HIV. The high-risk core population typically includes IDUs, MSM, and female and male sex workers (MSWs). The second group is the bridging population, which experiences an intermediate risk of exposure and provides links, such as through the clients of sex workers, between the high-risk core group and the third group, which is the low-risk general population.

The general population encompasses most of the population in any community as well as the vulnerable populations, who are generally at a low risk of HIV infection, such as prisoners, youth, and mobile populations, but who are also vulnerable to practices that may put them at higher risk of HIV infection. Once these vulnerable populations adopt higher-risk practices, they become part of the core or bridging populations. Different risk groups for different modes of HIV transmission can overlap, providing opportunities for an infection in one risk group to seed an epidemic in another group. The size and pattern of the epidemic also depend on the manner of mixing between the different risk groups, HIV prevalence in

²² Kelley and Eberstadt, "Behind the Veil"; Kelley and Eberstadt, "The Muslim Face of AIDS."

²³ Low et al., "Global Control."

Figure 1.1 Heterogeneity in Risk of Exposure to a Sexually Transmitted Infection



Source: Authors.

the different risk groups, and size of the different risk groups.

The heterogeneity in the spread of HIV or other STIs' spread can be understood analytically in terms of the basic reproductive number (R_0): the number of secondary infections that an index case would generate upon entrance into an infection-free population.²⁴ For an infection to spread, R_0 needs to be larger than one (figure 1.2, panel A). If $R_0 < 1$, the number of secondary infections each index case produces is on average less than one and the infection cannot sustain itself and dies out (figure 1.2, panel B). R_0 for a specific population depends on the risk behavior attributes of this population and duration of infection, as well as the transmission probability per coital act. The last can be influenced by a number of biological factors such as stage of HIV infection,²⁵ male circumcision status,²⁶ and coinfections.²⁷

Since sexual risk behavior and injecting drug use are characterized by substantial heterogeneity, each risk group in the population has its own R_0 . HIV or other STIs can be sustainable

and endemic in some risk groups (such as FSWs) while being below the sustainability threshold in other groups.²⁸ In the latter groups, STIs can still spread, but the transmission chains are not sustainable and eventually face "dead ends." This variability in risk leads to the group of sustainable transmission (GST)²⁹ concept, where the GST for a specific STI is the population where the infection's transmission chains are sustainable ($R_0 > 1$). The size of the GST in any community determines the potential size of the STI epidemic, and different STIs have different GST sizes (see appendix B, table B.1).

HIV spreads most rapidly in the high-risk core populations due to the higher levels of risk behavior, implying an R_0 considerably larger than one. Therefore, IDUs, MSM, and FSWs are normally the groups that first experience the burden of the HIV epidemic (figure 1.3). Subsequently, HIV spreads to the bridging populations (sexual partners of core populations). Bridging groups may or may not pass the infection to the general population. If bridging populations do pass the infection to the general population, then the levels of risk behavior in the latter population would determine the potential for a general population HIV epidemic. If the levels of risk are sufficiently high, such that $R_0 > 1$, then the infectious transmission chains are sustainable among the general population irrespective of further sexual contacts with core and bridging populations (figure 1.3, panel A). HIV will remain endemic in the general population even if all sexual contacts with core and bridging populations are protected or stopped. This is what has occurred in parts of sub-Saharan Africa, resulting in massive HIV epidemics.

On the other hand, if $R_0 < 1$, the HIV transmission chains are not sustainable, and the waves of HIV spread in the general population would stop shortly after entering this population

²⁴ Anderson and May, *Infectious Diseases of Humans*.

²⁵ Wawer et al., "Rates of HIV-1 Transmission."

²⁶ Auvert et al., "Randomized, Controlled Intervention Trial"; Bailey et al., "Male Circumcision for HIV Prevention"; Gray et al., "Male Circumcision for HIV Prevention."

²⁷ Abu-Raddad et al., "Genital Herpes"; Abu-Raddad, Patnaik, and Kublin, "Dual Infection with HIV and Malaria."

²⁸ Boily and Masse, "Mathematical Models"; Brunham and Plummer, "A General Model"; Yorke, Hethcote, and Nold, "Dynamics and Control."

²⁹ Abu-Raddad et al., "Genital Herpes"; Boily and Masse, "Mathematical Models"; Brunham and Plummer, "A General Model."

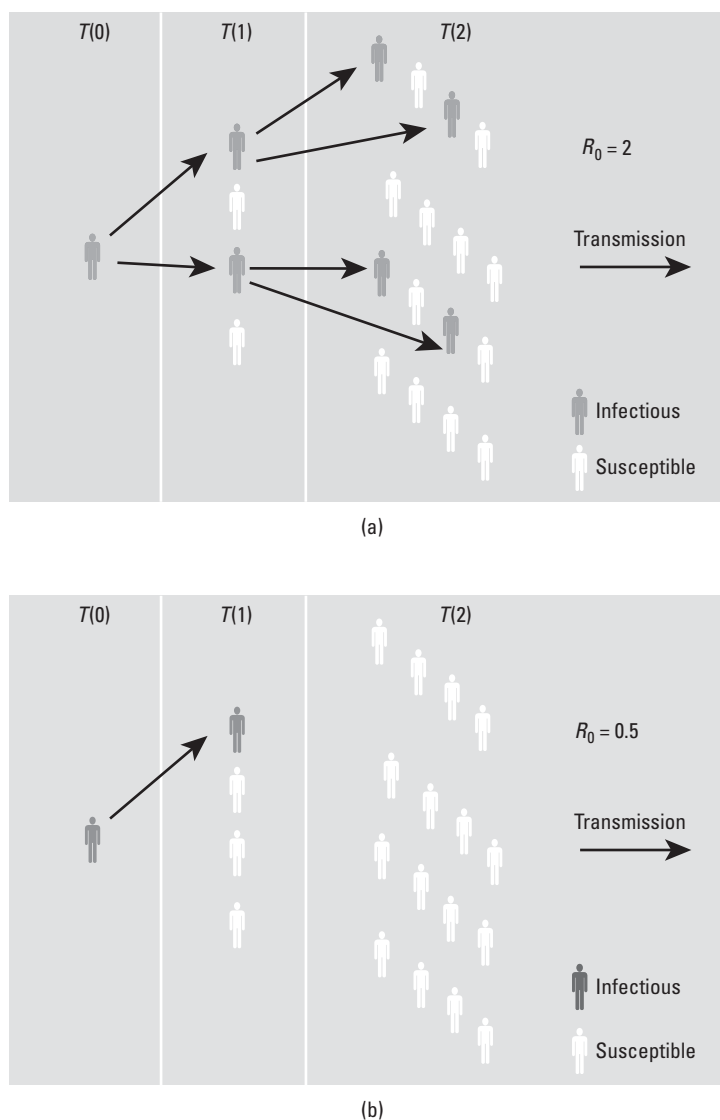
(figure 1.3, panel B). It is then unlikely that the HIV spread in the whole population would reach the massive scale it reached in sub-Saharan Africa, and the dynamics of HIV will be concentrated in the core and bridging populations, as is the case in Asia.³⁰ HIV infection could not then be endemic in the general population and would die out if all sexual contacts with core and bridging populations are protected or stopped. Figure 1.3 shows a schematic diagram contrasting a general population HIV epidemic versus a concentrated HIV epidemic in the core populations.

As shown below in our discussion of HIV spread in the different risk groups in MENA, the role of the general population in the HIV epidemics in MENA is very limited. HIV dynamics are mostly concentrated in the core populations of IDUs, MSM, and FSWs; therefore, these core populations are labeled in this report as *priority populations* to signify that these are the groups where curtailing HIV spread to below sustainability ($R_0 < 1$) would control the HIV epidemic in the whole population. Priority populations are the key populations for focusing HIV prevention efforts.

The conceptual framework delineated above will be adapted to help understand the dynamics of HIV infectious spread in MENA and the prospects for HIV infection expansion in different populations. The priority (core), bridging, and general populations will be defined within the context of MENA and the levels of risk will be delineated by the synthesis approach. This assessment will help facilitate a qualitative determination of the epidemic potential for each risk group and the potential for sustainable transmission in the general population. The synthesis also facilitates a determination of the phases of the HIV epidemics in MENA

³⁰ Commission on AIDS in Asia, *Redefining AIDS in Asia*.

Figure 1.2 Schematic Diagram of the Concept of R_0



Source: Reproduced with permission from Dr. Ruanne Barnabas, Fred Hutchinson Cancer Research Center, Seattle, Washington, USA.

Note: If $R_0 > 1$, the infection's transmission chains in the population are sustainable and the infection would spread. If $R_0 < 1$, the infection's transmission chains are not sustainable and the infection does not have the "critical mass" to spread in the population. $T(i)$ denotes the generation number of infection transmission.

and the degree of HIV penetration in the populations where it is self-sustainable.

One of the challenges of behavioral research in MENA is desirability bias.³¹ Although such bias is documented in all regions for both sexual behavior³² and injecting drug use,³³ the higher

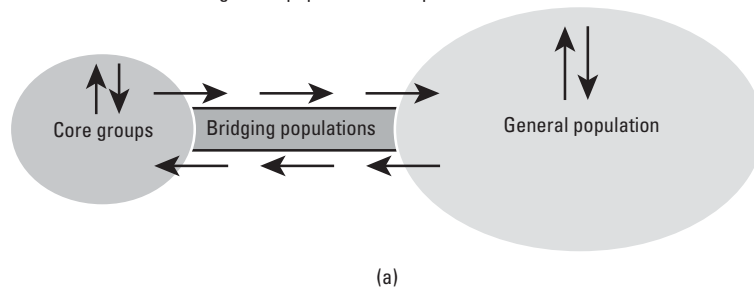
³¹ Lee and Renzetti, "The Problems of Researching Sensitive Topics."

³² Lee and Renzetti, "The Problems of Researching Sensitive Topics"; Caldwell and Quiggin, "The Social Context of AIDS"; Wadsworth et al., "Methodology of the National Survey."

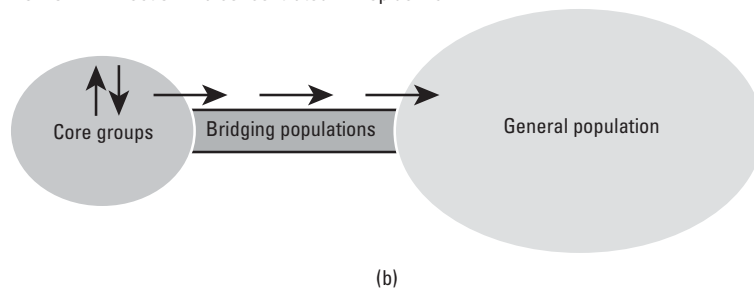
³³ Latkin and Vlahov, "Socially Desirable Response Tendency."

Figure 1.3 Two Patterns of HIV Infectious Spread in a Population

Flow of HIV infection in a general population HIV epidemic



Flow of HIV infection in a concentrated HIV epidemic



Source: Authors.

sensitivity of sexual and injecting attitudes and practices in conservative cultures, such as in MENA, adds a further limitation to behavioral research.³⁴ Individuals may find it difficult to report their true risk practices. Furthermore, it is often not possible to ask explicit questions about sexual behavior, particularly to women. Asking a general question such as “did you have a sexual contact” may lead to an affirmative answer for the wrong reason, because what is defined for these women as a sexual contact may be merely kissing.³⁵ Hence, in addition to reviewing HIV biological measures and risk behavior measures, this report also reviews the evidence for biological markers of risk behavior, including HCV infection prevalence for injecting drug users and STI prevalence, such as that of herpes simplex virus type 2 (HSV-2), for the sexually active populations. These proxy measures can gauge different aspects of the levels of risk behavior in the population and complement and validate reported levels of risk behavior.

³⁴ Tehrani and Malek-Afzalip, “Knowledge, Attitudes and Practices.”

³⁵ Hajiabdolbaghi et al., “Insights from a Survey of Sexual Behavior.”

Countries covered in this report

This report covers all countries that are included in the definition for the MENA Region at the World Bank, the UNAIDS MENA Regional Support Team (RST), and the Eastern Mediterranean Regional Office (EMRO) of WHO. Explicitly, this report includes data on Afghanistan, Algeria, Bahrain, Djibouti, the Arab Republic of Egypt, the Islamic Republic of Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Somalia, Sudan, the Syrian Arab Republic, Tunisia, the United Arab Emirates, the West Bank and Gaza, and the Republic of Yemen. Considering similarity in the cultural context and geographic proximity, data were also occasionally included for Israel (mainly among Israeli Arabs), Mauritania, and Turkey, when appropriate, bearing in mind that there are still differences in the epidemiological context between these countries and MENA countries.

Reflecting the availability of data at the country level, this report included more data from some countries than others. It is by no means an attempt to single out specific countries as opposed to others. The scale of HIV efforts is highly heterogeneous in the region and the level of willingness to share or report confidential data varies from one country to another.

Research methodology

The research methodology consists of an evidence-based epidemiological synthesis and analysis to characterize HIV epidemiology and assess HIV epidemic potential. This is achieved by identifying, collecting, reviewing, and analyzing extensive literature to establish the epidemiological risk factors, determine the nature and phases of HIV epidemics, delineate the populations affected, analyze proxy measures, and understand the vulnerabilities and drivers of the epidemic in the MENA context.

Identified and reviewed data sources

In preparing this report, the following publications, reports, and data sources were identified and reviewed, and their evidence synthesized:

1. Scientific literature identified through a Medline (PubMed) search for the topics covered in this project using a strategy with both free text and medical subheadings (MeSH). No language or year limitation was imposed. The literature review included searches for HIV infectious spread, sexual behavior, HSV-2 prevalence, human papillomavirus (HPV) and cervical cancer prevalence, bacterial STI prevalence, and HCV prevalence. The details of the search criteria are listed in appendix B. More than 3,900 literature sources were examined in this search.
2. Scientific literature on HIV, STIs, and HCV in peer-reviewed publications published in local and regional research journals not indexed in PubMed, but identified through the use of Google Scholar.
3. Thousands of country-level reports and data-sources, governmental studies and publications, nongovernmental organizations' (NGOs) studies and publications, and other institutional reports related to HIV in MENA. These reports were obtained from their sources or through contacts facilitated by UNAIDS, WHO, and the World Bank.
4. Hundreds of international organizations' reports and databases, covering a multitude of issues related to HIV infectious spread such as point-prevalence surveys; vulnerabilities; social studies; cervical cancer incidence and mortality rates at surveillance sites and at country levels; injecting drug use prevalence and trends and drug trade patterns; imprisonment rates; demographic and socioeconomic trends; and migration, refugees, and internally displaced persons. The organizations from which data were obtained include UNAIDS, WHO, the World Bank, the United Nations Children's Fund (UNICEF), the United Nations Office on Drugs and Crime (UNODC), the International Agency for Research on Cancer (IARC), the International Organization for Migration (IOM), the International Centre for Prison Studies (ICPS), the Office of the UN High Commissioner for Refugees (UNHCR), the Population Reference Bureau (PRB), and Family Health International (FHI).
5. Demographic and Health Survey (DHS) reports of MENA countries including Egypt, Jordan, Mauritania, Morocco, Sudan, Tunisia, and the Republic of Yemen. The utility of these reports was determined in terms of measures such as HIV knowledge, prevalence of symptoms of sexually transmitted diseases (STDs), and condom use among other behavioral and demographic measures.
6. An extensive WHO/EMRO database of notified HIV/AIDS cases and surveillance reports.
7. Consultations with key experts, public health officials, researchers, and academics in the region and beyond.

Nature of HIV/AIDS epidemiological evidence in MENA

This synthesis has highlighted the following characteristics of existing HIV/AIDS epidemiological evidence:

1. There is actually a considerable amount of epidemiological data on HIV/AIDS in MENA, contrary to the widely accepted perception of very limited data.
2. In addition to large sums of data published in peer-reviewed scientific literature, there are hundreds of studies that have never been published in scientific publications and are not easily or widely accessible. A large sum of data and studies continue to be disseminated within small circles at the national and regional levels in the form of confidential and nonconfidential reports, unpublished data, and news articles.
3. Data are fragmented, amorphous, and lack integration. The nature of evidence is best exemplified by *shattered glass*. Thousands of studies and point-prevalence surveys are fragmented and distributed among a multitude of stakeholders at the local, national, and regional levels with no coherent synthesis, analysis, or integration.
4. Large sums of data have never been methodically studied or analyzed. Valuable data such as HIV, STI, and HCV point-prevalence surveys among different general population groups, vulnerable population groups, and priority groups can be found in hundreds

of periodic country reports and case notifications.

5. The large sums of available data are not necessarily representative of the populations that they are supposed to represent and are often not collected using standard and accepted surveillance methodologies. A large fraction of data originates from facility-based surveillance on convenient samples of the population. It is often not clear whether internationally accepted ethical guidelines for human subject research were strictly followed while conducting the studies.

Limitations of this synthesis

Epidemiologic evidence in MENA varies substantially in quality. Although the quality of point-prevalence surveys in MENA has been steadily improving, a proportion of the data reported here are gleaned from point-prevalence surveys not conducted using standard methodology and internationally accepted guidelines for HIV sentinel surveillance and population-based surveys. In this report, an HIV point-prevalence survey refers to a measurement of HIV prevalence: the proportion of a population infected in a population sample consisting of a number of individuals identified with a common attribute. Although limited-quality point-prevalence surveys provide useful data, they may not be representative of the populations they are supposed to represent.³⁶ In this regard it must be stressed that all data reported here for any population group represent only the population sample on which the study was conducted. **The reported measures should not be generalized to represent the whole population group in any given country. Whenever data are cited in this report, the citation refers to a very specific, studied population sample.**

This report found that scientific papers published in peer-reviewed publications provided the best empirical evidence. Reports and studies on HIV not published in scientific journals tended to vary in quality and value, with the best reports and studies conducted or commissioned by international organizations such as

UNAIDS, WHO, and the World Bank. Many MENA countries report their notified HIV/AIDS cases and other HIV-related data to the WHO/EMRO Regional Database on HIV/AIDS, but the representativeness of these data could not be evaluated because countries did not report consistently over time and a description of data collection methodologies was not usually included in their reports.

The authors of this report elected to use all available data sources in the synthesis while paying special attention to data sources that may be questionable on methodological grounds. The synthesis factored in the limited representation of some of the data in the analyses and conclusions. The different data sources, irrespective of their representativeness or reliability, have generally converged on a consistent picture of HIV epidemiology that is delineated throughout this report.

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³⁶ Pisani et al., "HIV Surveillance."

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Injecting Drug Users and HIV

This chapter focuses on the biological evidence for the extent of human immunodeficiency virus (HIV) spread among injecting drug users (IDUs), the behavioral evidence for risky injection and sexual practices among this population group, and the context of injecting drug use in the Middle East and North Africa (MENA).

HIV PREVALENCE AMONG IDUs

Injecting drug use is one of the leading modes of HIV transmission and accounts for about 10% of HIV/AIDS (acquired immunodeficiency syndrome) cases worldwide.¹ HIV has been documented among IDUs in at least half of the MENA countries,² and there is robust evidence of concentrated epidemics among IDUs in the Islamic Republic of Iran and Pakistan.³ IDU has been documented as the dominant transmission mode in the Islamic Republic of Iran (more than 67% of cases)⁴ and Libya (as much as 90%).⁵ Of the 570 new infections reported in 2000 in Libya, almost all were among IDUs.⁶ IDU is also a significant mode of transmission for HIV in Afghanistan,⁷ Bahrain,⁸

Kuwait,⁹ Oman,¹⁰ Pakistan,¹¹ and Tunisia.¹² IDU has also contributed substantially to the epidemics in Algeria and Morocco.¹³

Table 2.1 contains the results of available HIV point-prevalence surveys of IDUs in MENA. HIV prevalence varies across and within countries, and observed levels of prevalence are not dissimilar to those observed in other regions.¹⁴ The data suggest that HIV prevalence among IDUs in MENA countries is in the low to intermediate range compared to other countries around the world.¹⁵ Globally, HIV prevalence ranges at the country level from below 0.01% in eight countries to 72.1% in Estonia.¹⁶

In what appears to be the first HIV incidence study in MENA, HIV incidence was measured among IDUs in detention in the Islamic Republic of Iran and found to be at a very high level of 16.8% per person-year.¹⁷

HIV biological data suggest that HIV has established itself among at least a number of IDU populations in several MENA countries.

¹ UNAIDS and WHO, *AIDS Epidemic Update 2003*.

² UNAIDS and WHO, *AIDS Epidemic Update 2002*.

³ UNAIDS, "Notes on AIDS in the Middle East and North Africa."

⁴ Iran Center for Disease Management, "AIDS/HIV Surveillance Report."

⁵ UNAIDS and WHO, *AIDS Epidemic Update 2001*.

⁶ Ibid.

⁷ Todd et al., "HIV, Hepatitis C, and Hepatitis B."

⁸ Al-Haddad, Baig, and Ebrahim, "Epidemiology of HIV and AIDS in Bahrain."

⁹ UNAIDS and WHO, *AIDS Epidemic Update 2005*.

¹⁰ Ibid.

¹¹ Shah et al., "An Outbreak of HIV Infection"; UNAIDS and WHO, *AIDS Epidemic Update 2005*; Rai et al., "HIV/AIDS in Pakistan"; Bokhari et al., "HIV Risk in Karachi and Lahore, Pakistan."

¹² UNAIDS and WHO, *AIDS Epidemic Update 2003*; UNAIDS and WHO, *AIDS Epidemic Update 2007*.

¹³ Ibid.

¹⁴ Aceijas et al., "Global Overview."

¹⁵ Mathers et al., "Global Epidemiology."

¹⁶ Ibid.

¹⁷ Jahani et al., "HIV Seroconversion."

Table 2.1 HIV Prevalence among IDUs in MENA

Country	Surveys' results for HIV prevalence among IDUs
Afghanistan	0.0% (World Bank 2008) 3.0% (Todd et al. 2007; Sanders-Buell et al. 2007) 3.4% (Mathers et al. 2008)
Algeria	11.0% (self-reported; Mimouni and Remaoun 2006; Algeria MOH [unknown])
Bahrain	0.0%–2.3% (Aceijas et al. 2004) 21.1% (Al-Haddad et al. 1994) 0.3% (Mathers et al. 2008)
Egypt, Arab Republic of	0.15% (drug addicts; Watts et al. 1993) 0.0% (El-Ghazzawi, Hunsmann, and Schneider 1987) 0.0% (Baqi et al. 1998) 0.0% (Aceijas et al. 2004) 0.0% (Saleh et al. 2000; El-Ghazzawi et al. 1995) 0.6% (Egypt MOH and Population National AIDS Program 2006) 2.55% (Mathers et al. 2008)
Iran, Islamic Republic of	1.2% (Khani and Vakili 2003) 4.0% (Ministry of Health and Medical Education of Iran 2004) 0.9% (injecting and noninjecting drug users; Alizadeh et al. 2005) 7.0% (incarcerated IDUs; Rahbar, Rooholamini, and Khoshnood 2004) 0.0% (treatment center; Rahbar, Rooholamini, and Khoshnood 2004) 63.0% (up to, in prisons; UNAIDS and WHO 2003) 30.0% (local prison; Nassirimanesh 2002) 6.9% (incarcerated IDUs; Rahbar, Rooholamini, and Khoshnood 2004) 22.0% (newly admitted IDUs to prison; Farhoudi et al. 2003) 24.0% (resident incarcerated IDUs in prison; Farhoudi et al. 2003) 24.4% (incarcerated IDUs; Jahani et al. 2009) 0.8% (Khani and Vakili 2003) 15.2% (Zamani et al. 2005) 23.2% (Zamani et al. 2006) 5.4% (noninjecting drug users; Zamani et al. 2005) 72.0% (a rural population of highly selected IDUs; Mojtahedzadeh et al. 2008) 1.4% (mainly noninjecting drug users; Talaie et al. 2007) 15.0% (Mathers et al. 2008)
Iraq	0.0% (prior to occupation; Aceijas et al. 2004)
Jordan	4.2% (Aceijas et al. 2004)
Kuwait	0.0% (Aceijas et al. 2004)
Lebanon	7.8% (Aceijas et al. 2004) 0.0% (Mishwar 2008)
Libya	0.5% (UNAIDS 2002b) 59.4% (Groterah 2002) 49.0% (up to; UNAIDS and WHO 2003) 22.0% (Mathers et al. 2008)
Oman	5.0% (Aceijas et al. 2004; Tawilah and Tawil 2001) 12.0% (IDUs under treatment; Oman MOH 2006) 18.0% (IDUs outside of prison and not under treatment; Oman MOH 2006) 27.0% (incarcerated IDUs; Oman MOH 2006) 11.8% (Mathers et al. 2008)
Morocco	6.5% (self-reported; Mathers et al. 2008) 1.6% (Alami 2009) 0.0% (Morocco MOH 2007)
Pakistan	0.0% (Iqbal and Rehan 1996) 0.0% (Kuo et al. 2006) 0.0% (Khawaja et al. 1997) 0.63% (Altaf et al. 2004)

Table 2.1 (Continued)

Country	Surveys' results for HIV prevalence among IDUs
	1.77% (Khawaja et al. 1997)
	0.4% (Parviz et al. 2006)
	9.7% (Shah et al. 2004)
	9.3% (Sindh AIDS Control Program 2004; Ur Rehman, Emmanuel, and Akhtar 2007)
	26.3% (Pakistan National AIDS Control Program 2005b)
	24.0% (Achakzai, Kassi, and Kasi 2007)
	0.5% (Bokhari et al. 2007)
	23.1% (UNAIDS and WHO 2005; Rai et al. 2007; Bokhari et al. 2007)
	10.8% (average of different cities with a range of 0.3%–25.4%; Pakistan National AIDS Control Program 2005a)
	15.8% (average of different cities with a range of 0%–51.8%; Pakistan National AIDS Control Program (2006–07)
	20.8% (average of different cities with a range of 12.3%–28.5%; Pakistan National AIDS Control Program 2008)
	2.6% (Platt et al. 2009)
	0.0% (Platt et al. 2009)
	10.8% (Mathers et al. 2008)
Saudi Arabia	0.15% (Njoh and Zimmo 1997b) 0.14% (Mathers et al. 2008)
Sudan	0.0% (Mathers et al. 2008)
Syrian Arab Republic	0.3% (Aceijas et al. 2004) 0.5% (51% of sample are IDUs; Syria Mental Health Directorate 2008)
Tunisia	0.3% (Aceijas et al. 2004; Mathers et al. 2008)
Turkey	2.65% (Mathers et al. 2008)

HEPATITIS C PREVALENCE AS A PROXY MARKER OF RISKY BEHAVIOR AMONG IDUs

HIV is only one of several blood-borne infections that can be transmitted through IDU. Hepatitis C virus (HCV) is a classical infection transmitted predominantly through percutaneous exposures and therefore can be used as a proxy of risky drug-injecting practices. IDUs form the leading risk group for HCV infection.¹⁸ HCV, however, is about six times as infectious as HIV through the parenteral route.¹⁹ Substantial presence of HCV infection in an IDU population does not necessarily imply that HIV is destined to have substantial prevalence in this population. Nevertheless, a high HCV prevalence in an IDU population suggests the potential for HIV transmission along the same route that HCV has traveled because both infections share the same transmission mode.

Table 2.2 describes the results of the available HCV point-prevalence surveys of IDUs in MENA. HCV prevalence levels are generally in the inter-

mediate to high range compared to those reported in other regions.²⁰ This confirms the potential for HIV to spread if HIV enters IDU networks and suggests that the use of nonsterile injecting equipment is a common practice. Recent and rapidly growing HIV epidemics documented among IDUs in Pakistan,²¹ following many years of low HIV prevalence,²² validate this conjecture. It bears notice that there is low awareness of HCV infection in MENA despite its seriousness. Only 20% of IDUs in Pakistan were aware of the existence of HCV, but 85% knew of the existence of HIV.²³

PREVALENCE OF DRUG INJECTION

The prevalence of IDU in MENA, at 0.2% of the population, is in the intermediate range compared

¹⁸ Ray Kim, "Global Epidemiology."

¹⁹ Goldmann, "Blood-Borne Pathogens and Nosocomial Infections"; Gerberding, "Management of Occupational Exposures."

²⁰ Sy and Jamal, "Epidemiology of Hepatitis C Virus (HCV) Infection."

²¹ Shah et al., "An Outbreak of HIV Infection"; UNAIDS and WHO, *AIDS Epidemic Update 2005*; Rai et al., "HIV/AIDS in Pakistan"; Bokhari et al., "HIV Risk in Karachi and Lahore, Pakistan."

²² Baqi et al., "HIV Antibody Seroprevalence"; Altaf et al., "Harm Reduction"; Parviz et al., "Background Demographics and Risk Behaviors"; UNODCP, "Baseline Study"; Agha et al., "Socio-Economic and Demographic Factors."

²³ Kuo et al., "High HCV Seroprevalence."

Table 2.2 HCV Prevalence among IDUs in MENA

Country	Survey results for HCV prevalence among IDUs
Afghanistan	36.6% (Todd et al. 2007)
Egypt, Arab Republic of	63.0% (Saleh et al. 2000; El-Ghazzawi et al. 1995)
Iran, Islamic Republic of	30.0% (injecting and noninjecting drug users; Alizadeh et al. 2005) 60.0% (Rahbar, Rooholamini, and Khoshnood 2004) 52.0% (Zamani et al. 2007) 59.4% (incarcerated IDUs; Rahbar, Rooholamini, and Khoshnood 2004) 78.0% (local prison; Nassirimanesh 2002) 47.4% (Khani and Vakili 2003) 45.3% (Zali et al. 2001) 11.2% (Imani et al. 2008) 14.48% (mainly noninjecting drug users; Talaie et al. 2007) 25.4% (Altaf et al. 2009) 19.2% (Altaf et al. 2009)
Lebanon	< 20.0% (Aceijas and Rhodes 2007) 25.0% (HIV infected; Ramia et al. 2004) 49.0% (Mishwar 2008) 80.0% (incarcerated IDUs; Kheirandish et al. 2009) 7.35% (injecting and noninjecting drug users; Mohammad et al. 2003)
Oman	11%–53% (Oman MOH 2006)
Pakistan	88.0% (Kuo et al. 2006) 89.0% (UNODCP and UNAIDS 1999) 60.0% (Achakzai, Kassi, and Kasi 2007) 87.0% (Pakistan National AIDS Control Program 2005c) 91.0% (Pakistan National AIDS Control Program 2005c) 17.3% (Platt et al. 2009) 8.0% (Platt et al. 2009)
Saudi Arabia	69.0% (Iqbal 2000) 75.0% (Njoh and Zimmo 1997a)
Syrian Arab Republic	60.5% (Othman and Monem 2002) 21.0% (self-reported; 51% of sample are IDUs; Syria Mental Health Directorate 2008)
Tunisia	39.7% (HIV infected; Kilani et al. 2007)

to other regions.²⁴ The prevalence from IDU globally is at 0.363%, with a range from 0.056% in South Asia to 1.5% in Eastern Europe.²⁵ This translates into 15.9 million people injecting drugs around the world.²⁶

Table 2.3 provides estimates of the number of IDUs in a number of MENA countries as extracted from a global review of IDU.²⁷ In another study, Aceijas et al. estimated that there are 0.3 to 0.6 million IDUs in MENA.²⁸ Further studies estimate that there are 7,500

(400 in Kabul) IDUs²⁹ in Afghanistan; 400,000³⁰ in the Arab world; 112,000,³¹ 137,000,³² at least 166,000,³³ 200,000,³⁴ 300,000,³⁵ and 70,000³⁶ in the Islamic Republic of Iran; and 60,000³⁷ and 180,000³⁸ in Pakistan. The average prevalence of IDU has been measured to be 4.7 IDUs per 1,000 men in a number of cities in Pakistan.³⁹

²⁴ Aceijas et al., "Global Overview"; Mathers et al., "Global Epidemiology"; Aceijas et al., "Estimates of Injecting Drug Users."

²⁵ Mathers et al., "Global Epidemiology."

²⁶ Ibid.

²⁷ Mathers et al., "Global Epidemiology"; Aceijas et al., "Estimates of Injecting Drug Users."

²⁸ Aceijas et al., "Global Overview."

²⁹ Action Aid Afghanistan, "HIV AIDS in Afghanistan"; World Bank, *HIV/AIDS in Afghanistan*; Ryan, "Travel Report Summary."

³⁰ UNODC, *World Drug Report 2004*.

³¹ Aceijas et al., "Global Overview."

³² Gheiratmand et al., "Uncertainty on the Number of HIV/AIDS Patients."

³³ Razzaghi, Rahimi, and Hosseini, *Rapid Situation Assessment*.

³⁴ Razzaghi et al., "Profiles of Risk."

³⁵ Wodak, "Report to WHO/EMRO."

³⁶ Ghys et al., "The Epidemics of Injecting Drug Use and HIV in Asia."

³⁷ United Nations Drug Control Programme, "Drug Abuse in Pakistan."

³⁸ Haque et al., "High-Risk Sexual Behaviours."

³⁹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

Table 2.3 Estimates of the Number and Prevalence of IDUs, Selected MENA Countries

Country	IDU estimates			IDU prevalence (%)		
	Low	Middle	High	Low	Middle	High
Afghanistan	22,720	34,080	45,440	0.16	0.24	0.32
	6,870	6,900	6,930	0.05	0.05	0.05
Algeria	26,333	40,961	55,590	0.14	0.22	0.29
Bahrain	337	674	1,011	0.08	0.16	0.24
Egypt, Arab Republic of	56,970	88,618	120,265	0.13	0.21	0.28
Iran, Islamic Republic of	70,000	185,000	300,000	0.17	0.46	0.74
		180,000			0.4	
Iraq	23,115	34,673	46,230	0.19	0.28	0.37
Jordan	3,200	4,850	6,500	0.11	0.16	0.22
Kuwait	2,700	4,100	5,500	0.2	0.3	0.41
Lebanon	2,200	3,300	4,400	0.09	0.14	0.19
Libya	4,633	7,206	9,779	0.15	0.23	0.32
		1,685			0.05	
Morocco		18,500			0.1	
Oman	2,800	4,250	5,700	0.2	0.3	0.4
Pakistan	54,000	462,000	870,000	0.07	0.5	1.12
				0.13	0.14	0.16
Qatar	780	1,190	1,600	0.15	0.22	0.3
Saudi Arabia	15,172	23,600	32,028	0.13	0.2	0.27
Sudan	24,319	37,828	51,337	0.13	0.2	0.28
Syrian Arab Republic	4,000	6,000	8,000	0.04	0.07	0.09
Tunisia	8,462	13,163	17,864	0.14	0.21	0.29
Turkey	66,591	99,887	133,182	0.16	0.23	0.31
United Arab Emirates	3,200	4,800	6,400	0.2	0.3	0.4
Yemen, Republic of	12,710	19,770	26,830	0.15	0.23	0.31

Sources: Adapted from Aceijas et al. (2006), with more recent estimates from Mathers et al. (2008).

In Kabul, Jalalabad, and Mazar-i-Sharif in Afghanistan, the IDU prevalence is estimated at 2.24 IDUs per 1,000 men.⁴⁰

There is evidence of a growing IDU problem in both the Islamic Republic of Iran⁴¹ and Pakistan.⁴² The proportion of IDUs out of all drug users in Pakistan appears to have increased from 3% in 1993, to 15% in 2000–01, and to 26% in 2006.⁴³

Drug injection is only one component of a wider drug problem in MENA. The Islamic Republic of Iran has the highest rate of heroin and opium dependence (injecting and noninjecting)

in the world (1 in every 17 people).⁴⁴ One study estimated that there are 0.5 million heroin addicts in Pakistan.⁴⁵ Another study reported an opiate use prevalence of 0.8% in Pakistan compared to 0.6% in the United States and 0.4% in India.⁴⁶ The prevalence of drug use in Saudi Arabia is estimated at 0.002% to 0.01%.⁴⁷ There are 27,000 drug users in Kuwait,⁴⁸ and 7,000, mostly IDUs, in Libya.⁴⁹ A study among Egyptian youth found

⁴⁰ World Bank, "Mapping and Situation Assessment."

⁴¹ Reid and Costigan, "Revisiting the Hidden Epidemic."

⁴² Khawaja et al., "HIV/AIDS and Its Risk Factors in Pakistan."

⁴³ UNODC, *World Drug Report 2007*.

⁴⁴ Razzaghi et al., "Profiles of Risk"; UNODC, *World Drug Report 2005, Volume I: Analysis*.

⁴⁵ UNODCP, "Global Illicit Drug Trends."

⁴⁶ UNODC, *World Drug Report 2005, Volume II: Statistics*.

⁴⁷ Njoh and Zimmo, "The Prevalence of Human Immunodeficiency Virus"; Hafeiz, "Socio-Demographic Correlates."

⁴⁸ Jenkins and Robalino, *HIV in the Middle East and North Africa*.

⁴⁹ Ibid.

that 6% of respondents reported that they had ever used drugs.⁵⁰ Prevalence of drug use in the West Bank and Gaza was estimated at 0.86%–1.21%, with a total of 35,000–45,000 drug users⁵¹ (including 900–1,400 heroin users⁵²).

MENA is flooded with inexpensive drugs due to record levels of heroin production in Afghanistan.⁵³ Around 92% of the world's supply of heroin in 2006 came from Afghanistan,⁵⁴ where it is estimated that 2.9% of all arable land is devoted to opium cultivation.⁵⁵ According to the United Nations Office on Drugs and Crime (UNODC),⁵⁶ the area under illicit opium poppy cultivation worldwide increased by 33% in 2006, mainly due to the 59% increase in Afghanistan. Afghan opium is increasingly being processed into morphine and heroin before exportation. In 2006, 53% of the opiates that left Afghanistan went via the Islamic Republic of Iran, and 33% left via Pakistan. These are the main routes for drug trafficking in the region. In 2006, 67% of opiate seizures worldwide occurred in the countries neighboring Afghanistan. Almost 30% of the global seizures occurred in the Islamic Republic of Iran alone, compared to 1.8% in the United Kingdom and 1.4% in the United States. MENA is a drug-trafficking destination as well as a route for drug traffic to Africa, Europe, and North America.

The countries surrounding Afghanistan, such as the Islamic Republic of Iran and Pakistan, are experiencing increases in heroin usage with the increased supply. IDU and HIV are known to follow drug-trafficking routes.⁵⁷ Opiate consumption is rising in MENA, though it is stable or declining in most other regions including North America, Western Europe, Oceania, and East and Southeast Asia.⁵⁸ Increases in drug use have been cited in the West Bank and Gaza since 1994, despite its severe isolation.⁵⁹

Afghanistan, the epicenter of opiate production, has very limited resources to deal with the IDU problem among its population.⁶⁰

FEMALE INJECTING DRUG USERS

The hardest-to-reach population of IDUs in MENA is that of the female IDUs; therefore, knowledge of this risk group is limited.⁶¹ There is a prevailing perception that the IDU problem in MENA is heavily concentrated among men. A study in the Islamic Republic of Iran among nursing students found that males were much more likely to use drugs than females.⁶² A study mapping IDU in Pakistan found that only 0.2% of IDUs were females.⁶³ However, there is also evidence suggesting a considerable injection drug problem among women. Although all IDUs in one study in Oman were males, 25%–58% of them knew of at least one female IDU.⁶⁴ Similarly in the Syrian Arab Republic, 48% of IDUs were familiar with at least one female IDU.⁶⁵ In the 1999 rapid situation assessment (RSA) in the Islamic Republic of Iran, 6.6% of drug users were women.⁶⁶ Another RSA of prisoners estimated that 10%–50% of female inmates had a history of drug use.⁶⁷ The number of female IDUs in the Islamic Republic of Iran has been estimated at 14,000.⁶⁸ There is a perception that drug dependence among Iranian women has been increasing in recent years.⁶⁹ Lastly, in a study of IDUs in Morocco, 16% were females.⁷⁰

INJECTING DRUG USERS AND RISKY BEHAVIOR

This section examines risky behaviors and practices in relation to HIV among IDUs, including the use of nonsterile injecting equipment,

⁵⁰ Ibid.

⁵¹ Shareef et al., "Assessment Study."

⁵² Shareef et al., "Drug Abuse Situation."

⁵³ UNODC, *World Drug Report 2007*.

⁵⁴ Ibid.

⁵⁵ UNODC, *Afghanistan: Opium Survey 2003*.

⁵⁶ UNODC, *World Drug Report 2007*.

⁵⁷ Beyrer et al., "Overland Heroin Trafficking Routes"; Sarkar et al., "Relationship of National Highway"; Xiao et al., "Expansion of HIV/AIDS in China"; Beyrer, "Human Immunodeficiency Virus (HIV) Infection Rates."

⁵⁸ UNODC, *World Drug Report 2007*.

⁵⁹ Shareef et al., "Assessment Study."

⁶⁰ Todd, Safi, and Strathdee, "Drug Use and Harm Reduction in Afghanistan."

⁶¹ Day et al., "Patterns of Drug Use."

⁶² Ahmadi, Maharlooy, and Alishahi, "Substance Abuse."

⁶³ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

⁶⁴ Oman MOH, "HIV Risk."

⁶⁵ Syria Mental Health Directorate, "Assessment of HIV Risk."

⁶⁶ Razzaghi, Rahimi, and Hosseini, *Rapid Situation Assessment*.

⁶⁷ Bolhari et al., "Assessment of Drug Abuse."

⁶⁸ Jenkins, "Report on Sex Worker Consultation in Iran."

⁶⁹ Shakeshaft et al., "Perceptions of Substance Use."

⁷⁰ Asouab, "Risques VIH/SIDA chez UDI."

frequency of drug injection, network structure, engagement in risky sexual behavior, and other high-risk practices.

Use of nonsterile injecting equipment among IDUs

The key risk behavior that exposes IDUs to HIV infection is the use of nonsterile injecting equipment. Evidence on IDUs in MENA depicts generally a high-risk environment. Several studies have documented relatively high levels of injection equipment reuse, such as the reuse of needles or syringes during last injection, last month, last six months, last year, or during lifetime. Table 2.4 lists prevalence of the use of nonsterile injecting equipment in different studies.

An average of six reuse incidents per person, per month has been reported among IDUs in Oman.⁷¹ Half of the IDUs in one district in the Islamic Republic of Iran used nonsterile injecting equipment on a daily basis.⁷² There are also reports of group injecting, such as in Pakistan, where, as reported in two studies, 79.5%⁷³ and 78%⁷⁴ of IDUs reported this practice. Forty percent of IDUs in Afghanistan reported receiving injections by a “street doctor” in the past six months.⁷⁵ This practice is associated with higher reuse of injecting equipment.⁷⁶

Use of nonsterile injections appears to be common in MENA, and the cleaning of syringes with bleach is very limited or not done at all.⁷⁷ In Pakistan, only 12.2% of IDUs in one study and 30.2% in another study reported using a clean syringe every time they injected drugs.⁷⁸ The use of nonsterile equipment varies substantially by socioeconomic status, such as in the Islamic Republic of Iran where it varies between 30% and 100%, with the highest proportion of those reusing injecting equipment among those at the lowest socioeconomic level.⁷⁹ Almost one-third of IDUs in

Afghanistan reported using nonsterile injecting equipment.⁸⁰ Seventy-eight percent of IDUs in Pakistan reported reusing syringes.⁸¹

The fraction of drug users who are injecting or reusing injection equipment appears to be increasing in at least some settings. After the 2001 Afghanistan war, levels of needle reuse increased in Pakistan from 56% to 76%, possibly due to changes in drug availability, purity and price, as well as the number of drug addicts.⁸² Though the majority of drug users in Pakistan use opiates by inhaling fumes of heroin powder burned on foil (a practice known as “chasing the dragon”),⁸³ there appears to be a shift toward injecting drugs, possibly due to an increase in heroin quality, which makes it not useful for inhalation, as well as the wider availability of injectable forms and the unavailability or rising cost of other forms of drugs after the Afghanistan war.⁸⁴ Changes in drug supply have been associated with increases in IDU in other countries including the Russian Federation, Thailand, and the United States.⁸⁵ This highlights the importance of strengthening surveillance systems to monitor changes in risky behavior.

Frequency of drug injection

The higher the frequency of drug injection, the larger the potential for HIV to spread in injecting drug networks. IDUs in MENA appear to inject drugs at a rate of more than once per day. IDUs reported 2.6 injections per day in Afghanistan.⁸⁶ Also in Afghanistan, 72% reported injecting drugs at least once a day and two-thirds reported injecting drugs for more than five years.⁸⁷ In Egypt, 75.3% of IDUs reported injecting drugs at least once per day.⁸⁸ In studies in Pakistan, 89.9%,⁸⁹ 67.7%,⁹⁰ 58%,⁹¹ and 38%⁹² of IDUs

⁷¹ Oman MOH, “HIV Risk.”

⁷² Razzaghi et al., “Profiles of Risk.”

⁷³ Altaf et al., “High Risk Behaviors.”

⁷⁴ Emmanuel et al., “HIV Risk Behavior.”

⁷⁵ World Bank, “Mapping and Situation Assessment.”

⁷⁶ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance in Pakistan* (Round III).

⁷⁷ Oman MOH, “HIV Risk”; Parviz et al., “Background Demographics and Risk Behaviors.”

⁷⁸ Kuo et al., “High HCV Seroprevalence.”

⁷⁹ Razzaghi et al., “Profiles of Risk.”

⁸⁰ World Bank, *HIV/AIDS in Afghanistan*.

⁸¹ Emmanuel et al., “HIV Risk Behavior.”

⁸² Strathdee et al., “Rise in Needle Sharing.”

⁸³ Ahmed et al., “HIV/AIDS Risk Behaviors.”

⁸⁴ Altaf et al., “High Risk Behaviors”; Shah and Altaf, “Prevention and Control of HIV/AIDS.”

⁸⁵ Neaigus et al., “Potential Risk Factors”; Rhodes et al., “Explosive Spread”; Westermeyer, “The Pro-Heroin Effects.”

⁸⁶ World Bank, “Mapping and Situation Assessment.”

⁸⁷ Action Aid Afghanistan, “HIV AIDS in Afghanistan.”

⁸⁸ Elshimi, Warner-Smith, and Aon, “Blood-Borne Virus Risks.”

⁸⁹ Kuo et al., “High HCV Seroprevalence.”

⁹⁰ Ibid.

⁹¹ Platt et al., “Prevalence of HIV.”

⁹² Ibid.

Table 2.4 Levels of Nonsterile Needle or Syringe Use among IDUs in Several MENA Countries

Country	Survey results for use of nonsterile needles or syringes
Afghanistan	50.0% (UNAIDS 2008) 50.4% (Todd et al. 2007) 46.0% (World Bank 2008)
Algeria	41.0% (Mimouni and Remaoun 2006)
Egypt, Arab Republic of	32.2% (Egypt MOH and Population National AIDS Program 2006) 11.0% (Salama et al. 1998) 59.0% (UNAIDS 2008) 55.0% (Elshimi, Warner-Smith, and Aon 2004)
Iran, Islamic Republic of	67.0% (Day et al. 2006) 49.8% (Razzaghi, Rahimi, and Hosseini 1999) 24.8% (Razzaghi, Rahimi, and Hosseini 1999) 48.3% (Zamani et al. 2006) 11.0% (Zamani et al. 2006) 30.6% (Zamani et al. 2005) 30%–100% (Razzaghi et al. 2006) 21.0% (Zamani et al. 2008) 39.9% (Zamani et al. 2008) 35.2%–48.6% (Farhoudi et al. 2003) 73.0% (Mojtahedzadeh et al. 2008) 26.6% (Kheirandish et al. 2009)
Lebanon	33.0% (Ingold 1994) 42.0% (Aaraj [unknown]) 40.0% (Jenkins and Robalino 2003) 64.7% (Hermez [unknown]) (Aaraj [unknown]) 34.2% (Mishwar 2008) 17.0% (Mishwar 2008) 34.2% (Mishwar 2008)
Libya	44.0% (UNAIDS 2008)
Morocco	47.0% (UNAIDS 2008) 72.6% (Asouab 2005; Morocco MOH 2007)
Oman	44%–70% (different groups of IDUs; Oman MOH 2006)
Pakistan	56.8% (Ahmed et al. 2003) 56.0% (Ahmed et al. 2003) 76.0% (Strathdee et al. 2003) 52.0% (Baqi et al. 1998) 47.0% (Parviz et al. 2006) 48.2% (Zafar et al. 2003) 58.7% (Emmanuel et al. 2004) 82.0% (Pakistan National AIDS Control Program 2005b) 23.0% (Pakistan National AIDS Control Program 2005c) 78.1% (Emmanuel and Fatima 2008) 18.0% (Bokhari et al. 2007) 48.0% (Pakistan National AIDS Control Program 2005c) 82.0% (Pakistan National AIDS Control Program 2005c) 72.2% (Afghan refugees; Zafar et al. 2003) 25.2% (Saleem, Adrien, and Razaque 2008) 47.1% (Pakistan National AIDS Control Program 2005a) 21.9% (Pakistan National AIDS Control Program 2006–07) 17.6% (Pakistan National AIDS Control Program 2008) 8.5% (Altaf et al. 2009) 33.6% (Altaf et al. 2009) 41.0% (Platt et al. 2009) 14.0% (Platt et al. 2009)
Syrian Arab Republic	47.0% (UNAIDS 2008) 28.0% (Syria Mental Health Directorate 2008)

reported a daily injection. Also in Pakistan, studies found that IDUs reported a mean of 2,⁹³ 2.3,⁹⁴ 2.3,⁹⁵ 2.2,⁹⁶ and 2.18⁹⁷ injections per day. In Syria, IDUs reported a mean of 41 injections per month.⁹⁸

Network structure among injecting drug users

The social and injecting networks of IDUs play an important role in determining the risk of HIV infection.⁹⁹ Collecting data on just a few risky behavior measures, such as the use of nonsterile injecting equipment, is not sufficient to map the risk of HIV exposure. MENA appears to have a diversity of typologies of risk networks across countries and sometimes within any one country.¹⁰⁰ In Lebanon, it appears that IDUs form closed, small networks with injection occurring in private homes and not at shooting galleries.¹⁰¹ For 56.7% of IDUs, the main partner in injection reuse was a friend, and the average number of partners in syringe reuse was 1.24.¹⁰² Group injecting with nonsterile injecting equipment was reported by 26.7% of IDUs; this was often part of a ritual among friends.¹⁰³ A similar pattern was found in Syria¹⁰⁴ and among some of the IDU communities in the Islamic Republic of Iran.¹⁰⁵

In Syria, a study has found that when the syringe was given to someone else after use, it was given to a friend in 62% of cases, usual sexual partner in 19% of cases, and to an acquaintance in 8% of cases.¹⁰⁶ Among 67% of the study participants, the person who injected

the IDU was a friend, among 11% of cases the person was the usual sexual partner, and among 4% of the cases the person was an acquaintance.¹⁰⁷ Injection by a dealer was reported by only 5% of the participants.¹⁰⁸

A study in two settings in the Islamic Republic of Iran found that the mean size of the injecting drug network in the previous month was 2.1 and 2.6 persons.¹⁰⁹ Most injection equipment reuse occurred between people who knew each other closely, such as friends or spouses.¹¹⁰ In such circumstances, the injecting network and the social network appear to overlap and HIV cannot easily propagate from one subnetwork to another.

In other parts of MENA, the social and injecting networks are not necessarily overlapping and the reuse of injection equipment can occur between people who are not necessarily socially related, such as in shooting galleries. This has been observed among some IDU communities in the Islamic Republic of Iran¹¹¹ and Pakistan.¹¹² Seventy-three percent of IDUs in one study in Pakistan injected drugs in groups, with 50% of them using nonsterile injecting equipment.¹¹³ In another study in Pakistan, between 79% and 89% of IDUs had their last injection in a park or a street.¹¹⁴ In further studies in Pakistan, this was also reported by 77.7%,¹¹⁵ 65.7%,¹¹⁶ and 82.2%¹¹⁷ of IDUs, although 72.3%,¹¹⁸ 64.1%,¹¹⁹ and 64.4%¹²⁰ of these IDUs reported injecting with a friend or an acquaintance. In studies, injection by a “professional” injector or street

⁹³ Bokhari et al., “HIV Risk in Karachi and Lahore, Pakistan”; Pakistan National AIDS Control Program, “Pilot Study in Karachi & Rawalpindi.”

⁹⁴ Altaf et al., “High Risk Behaviors”; Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

⁹⁵ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

⁹⁶ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

⁹⁷ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

⁹⁸ Syria Mental Health Directorate, “Assessment of HIV Risk.”

⁹⁹ Neaigus et al., “The Relevance of Drug Injectors.”

¹⁰⁰ Razzaghi et al., “Profiles of Risk.”

¹⁰¹ Mishwar, “An Integrated Bio-Behavioral Surveillance Study.”

¹⁰² Aaraj, “Report on the Situation Analysis”; Hermez et al., “HIV/AIDS Prevention among Vulnerable Groups.”

¹⁰³ Hermez, “HIV/AIDS Prevention through Outreach”; Aaraj, “Report on the Situation Analysis.”

¹⁰⁴ Syria Mental Health Directorate, “Assessment of HIV Risk.”

¹⁰⁵ Razzaghi et al., “Profiles of Risk.”

¹⁰⁶ Syria Mental Health Directorate, “Assessment of HIV Risk.”

¹⁰⁷ Ibid.

¹⁰⁸ Ibid.

¹⁰⁹ Zamani et al., “Needle and Syringe Sharing Practices.”

¹¹⁰ Ibid.

¹¹¹ Razzaghi et al., “Profiles of Risk.”

¹¹² Emmanuel and Fatima, “Coverage to Curb the Emerging HIV Epidemic.”

¹¹³ Ibid.

¹¹⁴ Pakistan National AIDS Control Program, “Pilot Study in Karachi & Rawalpindi.”

¹¹⁵ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹¹⁶ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹¹⁷ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

¹¹⁸ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹¹⁹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹²⁰ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

doctor at least once in the last month was reported by 42.1%,¹²¹ 27.1%,¹²² and 60.6%¹²³ of IDUs in Pakistan. According to a study conducted in Afghanistan, a large fraction of IDUs reported injecting drugs in open spaces such as in streets or parks.¹²⁴

By reusing injection equipment, street doctors may connect different IDU subnetworks together. Well-connected injecting drug networks are most conducive to HIV spread. This is manifested in the high HIV and HCV prevalence levels among different IDU communities in the Islamic Republic of Iran, Libya, and Pakistan, as delineated above. The social environment and injecting network structure need to be considered in any prevention interventions among IDUs in MENA. Network-level interventions can reinforce individual-level interventions.¹²⁵

Engagement of IDUs in risky sexual behavior

Various studies indicated that the majority of IDUs in MENA are sexually active and engage in risky sexual behavior.¹²⁶ Being married (currently or at some point) was reported by 55.5% of IDUs¹²⁷ in Egypt; 57%,¹²⁸ 52%,¹²⁹ and 59%¹³⁰ in different studies in the Islamic Republic of Iran; 50%¹³¹ in Pakistan; and 3%–28%¹³² in Oman. In Pakistan, 44.7%,¹³³ 45.24%,¹³⁴ and 41.1%¹³⁵ of IDUs in

different studies reported current marriage. Multiple sexual partnerships were reported by 73% of IDUs in Egypt,¹³⁶ and 24% in Pakistan.¹³⁷

In Afghanistan, IDUs reported multiple,¹³⁸ regular, and casual sexual partnerships and contacts with female sex workers (FSWs), and 75% of them at some point had sex with a female.¹³⁹ In Egypt, 70.5% of IDUs had sex in the last year.¹⁴⁰ In the Islamic Republic of Iran, one-third of married IDUs had extramarital sex, over half of those divorced or separated had sex after separation, and over 70% of unmarried IDUs reported premarital sex.¹⁴¹ Also in the Islamic Republic of Iran, 54% of IDUs reported two or more sexual partners in their lifetime,¹⁴² and 57.1% of HIV-positive and 39.4% of uninfected incarcerated IDUs reported more than three lifetime sexual partners.¹⁴³ In yet another study in the Islamic Republic of Iran, drug use was associated with premarital and extramarital sex among truck drivers and youth.¹⁴⁴ A recent RSA in the Islamic Republic of Iran has also indicated that 44% of married drug users engage in extramarital sex.¹⁴⁵

In Lebanon, the average number of sex partners among IDUs in the last year was 2.85, and 34.1% of IDUs reported a casual sexual partner in the past month.¹⁴⁶ Another study reported that 66% of IDUs had one to five sexual partners and 3% had more than five partners.¹⁴⁷ In Morocco, 48.1% of males and 70.1% of females of a group of mainly IDUs reported multiple sexual partners in the last 12 months.¹⁴⁸

In Oman, 91%–100% of IDUs reported they had sex with two to eight sexual partners in the past month.¹⁴⁹ In Pakistan, 58%–79% of IDUs had sex in the last six months with a nonpaid

¹²¹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹²² Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹²³ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

¹²⁴ World Bank, "Mapping and Situation Assessment."

¹²⁵ Neaigus, "The Network Approach."

¹²⁶ Egypt MOH and Population National AIDS Program, *HIV/AIDS Biological and Behavioral Surveillance Survey*; Kuo et al., "High HCV Seroprevalence"; Elshimi, Warner-Smith, and Aon, "Blood-Borne Virus Risks."

¹²⁷ Egypt MOH and Population National AIDS Program, *HIV/AIDS Biological and Behavioral Surveillance Survey*.

¹²⁸ Zamani et al., "High Prevalence of HIV Infection."

¹²⁹ Zamani et al., "Prevalence of and Factors Associated with HIV-1 Infection."

¹³⁰ Zamani et al., "Prevalence and Correlates of Hepatitis C Virus."

¹³¹ Haque et al., "High-Risk Sexual Behaviours"; Pakistan National AIDS Control Program, "Pilot Study in Karachi & Rawalpindi."

¹³² Oman MOH, "HIV Risk."

¹³³ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹³⁴ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹³⁵ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

¹³⁶ El-Sayed et al., "Evaluation of Selected Reproductive Health Infections."

¹³⁷ Emmanuel et al., "HIV Risk Behavior."

¹³⁸ Sanders-Buell et al., "A Nascent HIV Type 1 Epidemic."

¹³⁹ World Bank, "Mapping and Situation Assessment."

¹⁴⁰ Egypt MOH and Population National AIDS Program, *HIV/AIDS Biological and Behavioral Surveillance Survey*.

¹⁴¹ Razzaghi, Rahimi, and Hosseini, *Rapid Situation Assessment*.

¹⁴² Zamani et al., "High Prevalence of HIV Infection."

¹⁴³ Rahbar, Rooholamini, and Khoshnood, "Prevalence of HIV Infection."

¹⁴⁴ Tehrani and Malek-Afzalip, "Knowledge, Attitudes and Practices."

¹⁴⁵ Narenjitha et al., "Rapid Situation Assessment."

¹⁴⁶ Aaraj, "Report on the Situation Analysis"; Hermez et al., "HIV/AIDS Prevention among Vulnerable Groups."

¹⁴⁷ Mishwar, "An Integrated Bio-Behavioral Surveillance Study."

¹⁴⁸ Asouab, "Risques VIH/SIDA chez UDI"; Morocco MOH, "Situation épidémiologique actuelle du VIH/SIDA au Maroc."

¹⁴⁹ Oman MOH, "HIV Risk."

partner,¹⁵⁰ and 42%–62% reported having sex with a woman in the last year.¹⁵¹ Also in Pakistan, individual studies reported that 42.2%,¹⁵² 45.7%,¹⁵³ and 37.8%¹⁵⁴ of IDUs had regular female sexual partners in the last six months. A history of a sexually transmitted disease (STD) was reported in different studies to be 66%,¹⁵⁵ 54.1%,¹⁵⁶ and 40%¹⁵⁷ for IDUs. Seven percent of those arrested for drug-related crimes were found positive for syphilis (a sexually transmitted infection [STI]).¹⁵⁸ In Syria, IDUs had a mean number of seven sexual partners over the last 12 months.¹⁵⁹

Further data in MENA indicate that 44% of IDUs in Algeria either had sex with FSWs or sold sex.¹⁶⁰ Thirty-eight percent of female IDUs in Egypt were previously convicted for prostitution.¹⁶¹ Seventy-four percent of sex partners of IDUs in one study in the Islamic Republic of Iran were FSWs,¹⁶² and for women who injected drugs in a study in the Islamic Republic of Iran, the most common source of income was sex work.¹⁶³ Nine percent of IDUs in one study in Pakistan reported using nonsterile needles or syringes with a sex worker in the last week.¹⁶⁴

Table 2.5 shows a summary of several other measures of overlapping injecting and sexual risk behaviors among IDUs. The overlap measures include having ever paid for sex and contacting commercial sex workers, engagement in sex work for drugs or money in the last month, having sex with a man or a boy, and condom use.

Other high-risk practices

Other high-risk drug-injection practices have been documented in MENA. Ninety-one percent of IDUs in a study in Pakistan reported deliberately drawing their blood into the syringe when they injected drugs (a practice known as “jerking”).¹⁶⁵ This procedure was associated with a sevenfold higher chance of HCV infection, attesting to the danger of this practice for HIV transmission.¹⁶⁶ There is also documented evidence of the commercial sale of blood among IDUs. In a number of studies in Pakistan, 52%,¹⁶⁷ 22%,¹⁶⁸ 30%,¹⁶⁹ 28%,¹⁷⁰ 27%,¹⁷¹ and 3%¹⁷² of IDUs reported giving blood for profit. This practice led to a large number of HIV infections in China through contaminated blood.¹⁷³ Private clinics in Pakistan are known to provide monetary reimbursement for blood donation, thereby creating an incentive for IDUs to give blood.¹⁷⁴ Lastly, there is evidence of at least some mobility among drug users; between 54% and 72% of different IDU groups in Oman reported injecting outside Oman.¹⁷⁵

KNOWLEDGE OF HIV/AIDS

Levels of HIV/AIDS knowledge among IDUs in MENA appear to be variable. Only 40% of IDUs in Afghanistan¹⁷⁶ and 18.3% of Afghani IDUs in Pakistan¹⁷⁷ reported ever hearing of HIV/AIDS. A report from Egypt indicated a higher level at 43%, but with 40% reporting not knowing that HIV/AIDS can be transmitted through reuse of nonsterile needles.¹⁷⁸ However, almost all IDUs in a different study in Egypt were aware of HIV and some of its transmission modes, but still had

¹⁵⁰ Pakistan National AIDS Control Program, “Pilot Study in Karachi & Rawalpindi.”

¹⁵¹ Bokhari et al., “HIV Risk in Karachi and Lahore, Pakistan.”

¹⁵² Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹⁵³ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹⁵⁴ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

¹⁵⁵ Kuo et al., “High HCV Seroprevalence.”

¹⁵⁶ Ibid.

¹⁵⁷ Haque et al., “High-Risk Sexual Behaviours.”

¹⁵⁸ Baqi, “HIV Seroprevalence.”

¹⁵⁹ Syria Mental Health Directorate, “Assessment of HIV Risk.”

¹⁶⁰ Mimouni and Remaoun, “Etude du Lien Potentiel entre l’Usage Problématique de Drogues et le VIH/SIDA.”

¹⁶¹ Salama et al., “HIV/AIDS Knowledge and Attitudes.”

¹⁶² Razzaghi, Rahimi, and Hosseini, *Rapid Situation Assessment*.

¹⁶³ Razzaghi et al., “Profiles of Risk.”

¹⁶⁴ Mayhew et al., “Protecting the Unprotected.”

¹⁶⁵ Kuo et al., “High HCV Seroprevalence.”

¹⁶⁶ Ibid.

¹⁶⁷ Baqi et al., “HIV Antibody Seroprevalence.”

¹⁶⁸ Ibid.

¹⁶⁹ Ahmed et al., “HIV/AIDS Risk Behaviors.”

¹⁷⁰ Altaf et al., “High Risk Behaviors.”

¹⁷¹ Platt et al., “Prevalence of HIV.”

¹⁷² Ibid.

¹⁷³ Lau, Thomas, and Lin, “HIV-Related Behaviours.”

¹⁷⁴ Ahmed et al., “HIV/AIDS Risk Behaviors.”

¹⁷⁵ Oman MOH, “HIV Risk.”

¹⁷⁶ Todd, Safi, and Strathdee, “Drug Use and Harm Reduction in Afghanistan.”

¹⁷⁷ Zafar et al., “HIV Knowledge and Risk Behaviors.”

¹⁷⁸ Action Aid Afghanistan, “HIV AIDS in Afghanistan.”

Table 2.5 Measures of Overlapping Injecting and Sexual Risk Behaviors of IDUs in MENA

Country	Paying for sex and contacting commercial sex workers	Engagement in sex work for drugs or money	Having sex with a man or a boy	Condom use
Afghanistan	69.0% (World Bank 2006) 76.2% (Todd et al. 2007) 48.0% (World Bank 2008)		32.0% (World Bank 2006) 8.3% (Todd et al. 2007) 21.0% (World Bank 2008)	0.0% (ever use; Sanders-Buell et al. 2007) 17.0% (ever use; commercial sex; World Bank 2008)
Algeria		40.0% (Mimouni and Remaoun 2006) 44.0% (Algeria MOH [unknown])		
Egypt, Arab Republic of	13.3% (Egypt MOH and Population National AIDS Program 2006)		9.4% (Egypt MOH and Population National AIDS Program 2006)	34.1% (ever use; regular partners; Egypt MOH and Population National AIDS Program 2006) 12.8% (ever use; nonregular non-commercial partners; Egypt MOH and Population National AIDS Program 2006) 11.8% (ever use; with CSWs; Egypt MOH and Population National AIDS Program 2006) 66.0% (ever use; Elshimi, Warner-Smith, and Aon. 2004) 20.0% (ever use; El-Sayed et al. 2002) 9.0% (always; El-Sayed et al. 2002)
Iran, Islamic Republic of	23.0% (Narenjiha et al. 2005) 9.2%–14.9% (IDU prisoners; Farhoudi et al. 2003) 23.3% (Kheirandish et al. 2009)	28.6% (last month; Eftekhar et al. 2008)	30.0% (Razzaghi, Rahimi, and Hosseini 1999) 13.3% (Narenjiha et al. 2005) 1.6% (IDU prisoners; Farhoudi et al. 2003) 5%–17% (Ministry of Health and Medical Education of Iran 2006; Mostashari, UNODC, and Darabi 2006) 5.0% (Kheirandish et al. 2009)	53.0% (ever use; Zamani et al. 2005) 52.0% (ever use; Narenjiha et al. 2005) 37.0% (last sex; Zamani et al. 2005) 11.3%–12.4% (ever use; IDU prisoners; Farhoudi et al. 2003)
Lebanon	47.1% (Mishwar 2008) 32.9% (last month; Hermez [unknown]; Aaraj [unknown])	33.0% (UNAIDS 2008) 27.1% (Hermez [unknown]; Aaraj [unknown]) 17.0% (Mishwar 2008)	24.7 (Aaraj [unknown])	88.0% (ever use; Aaraj [unknown]) 59.0% (ever use; Ingold 1994) 5.8% (last sex; regular; Hermez [unknown]; Aaraj [unknown]) 34.6% (last sex; casual sex; Aaraj [unknown]; Hermez et al. [unknown]) 39.3% (last sex; commercial sex; Aaraj [unknown]; Hermez et al. [unknown])
Oman		60%–97% (Oman MOH 2006)	12%–25% (always; Oman MOH 2006)	53%–69% (ever use; Oman MOH 2006) 12%–25% (always; Oman MOH 2006)

Table 2.5 (Continued)

Country	Paying for sex and contacting commercial sex workers	Engagement in sex work for drugs or money	Having sex with a man or a boy	Condom use
Pakistan	68.9% (Kuo et al. 2006)	5.5% (Emmanuel et al. 2004)	37.4% (Kuo et al. 2006)	40.0% (ever use; Emmanuel and Fatima 2008)
	50.4% (Kuo et al. 2006)		14.0% (Haque et al. 2004)	
	58.3% (Altaf et al. 2007)	14%–20% (Pakistan National AIDS Control Program 2005b)	10.8% (Emmanuel et al. 2004)	37.5% (ever use; Kuo et al. 2006)
	49.0% (Haque et al. 2004)		14.7% (Emmanuel and Fatima 2008)	14.2% (ever use; Kuo et al. 2006)
	42.9% (Strathdee et al. 2003)	5.3% (Emmanuel and Fatima 2008)		7.0% (ever use; Parviz et al. 2006)
	20.8% (Emmanuel et al. 2004)	5%–11% (Bokhari et al. 2007)	14.0% (Bokhari et al. 2007)	34.0% (ever use; Altaf et al. 2007)
	41.0% (Afghani refugees; Zafar et al. 2003)	19.6% (Pakistan National AIDS Control Program 2006–07)		10.0% (ever use; Haque et al. 2004)
	13%–28% (Pakistan National AIDS Control Program 2005b)			17%–32% (last sex; FSW; Bokhari et al. 2007)
	12.6% (Emmanuel and Fatima 2008)	16.8% (Pakistan National AIDS Control Program 2008)		10%–25% (last sex; sex work; Bokhari et al. 2007)
	30%–34% (Bokhari et al. 2007)			7%–13% (last sex; commercial sex; Bokhari et al. 2007)
	18%–23% (with MSWs; Bokhari et al. 2007)			46%–66% (not used last six months; nonpaid partners; Pakistan National AIDS Control Program 2005b)
	8%–27% (with MSWs; Pakistan National AIDS Control Program 2005b)			49%–86% (not used last six months; commercial sex; Pakistan National AIDS Control Program 2005b)
	3.3% (with <i>hijra</i> ; Emmanuel et al. 2004)			25.0% (last sex; regular partner; Pakistan National AIDS Control Program 2005a)
	26.6% (Pakistan National AIDS Control Program 2005a)			16.5% (last sex; regular partner; Pakistan National AIDS Control Program 2006–07)
	12.6% (Pakistan National AIDS Control Program 2006–07)			33.5% (last sex; regular partner; Pakistan National AIDS Control Program 2008)
	17.7% (Pakistan National AIDS Control Program 2008)			16.6% (last sex; FSW; Pakistan National AIDS Control Program 2005a)
	13.2% (with MSW or <i>hijra</i> ; Pakistan National AIDS Control Program 2005a)			20.9% (last sex; FSW; Pakistan National AIDS Control Program 2006–07)
	14.7% (with MSW or <i>hijra</i> ; Pakistan National AIDS Control Program 2006–07)			31.0% (last sex; FSW; Pakistan National AIDS Control Program 2008)
	13.9% (with MSW or <i>hijra</i> ; Pakistan National AIDS Control Program 2008)			12.5% (last sex; man or <i>hijra</i> ; Pakistan National AIDS Control Program 2005a)
	24.0% (Platt et al. 2009)			12.9% (last sex; MSW or <i>hijra</i> ; Pakistan National AIDS Control Program 2006–07)
	21.0% (Platt et al. 2009)			13.8% (last sex; MSW or <i>hijra</i> ; Pakistan National AIDS Control Program 2008)
	14.0% (with a transgendered person; Platt et al. 2009)			45.0% (last sex; Platt et al. 2009)
	2.0% (with a transgendered person; Platt et al. 2009)			32.0% (last sex; Platt et al. 2009)

(continued)

Table 2.5 (Continued)

Country	Paying for sex and contacting commercial sex workers	Engagement in sex work for drugs or money	Having sex with a man or a boy	Condom use
Syrian Arab Republic		47.0% (51% of sample are IDUs; Syria Mental Health Directorate 2008)	5.0% (51% of sample are IDUs; Syria Mental Health Directorate 2008)	39.0% (less than half the time; 51% of sample are IDUs; Syria Mental Health Directorate 2008) 21.0% (more than half the time; 51% of sample are IDUs; Syria Mental Health Directorate 2008) 19.0% (consistent; 51% of sample are IDUs; Syria Mental Health Directorate 2008) 27.0% (less than half the time; commercial sex; 51% of sample are IDUs; Syria Mental Health Directorate 2008) 5.0% (more than half the time; commercial sex; 51% of sample are IDUs; Syria Mental Health Directorate 2008) 17.0% (consistent; commercial sex; 51% of sample are IDUs; Syria Mental Health Directorate 2008)

Note: CSW=commercial sex worker; MSW=male sex worker.

several misconceptions.¹⁷⁹ The knowledge level was very high in Lebanon and almost all IDUs were aware of the risk of infection through reuse of nonsterile injecting equipment (95.5%) and unprotected sex (100%).¹⁸⁰ However, despite HIV/AIDS knowledge, a large fraction of IDUs do not feel at risk of HIV infection. According to individual studies, only 33.9%,¹⁸¹ 31.1%,¹⁸² and 35.9%¹⁸³ of IDUs in Pakistan and 27% of IDUs in Syria¹⁸⁴ reported feeling at risk of HIV infection. A more comprehensive study of HIV/AIDS knowledge in MENA can be found in chapter 7.

¹⁷⁹ Egypt MOH and Population National AIDS Program, *HIV/AIDS Biological and Behavioral Surveillance Survey*.

¹⁸⁰ Aaraj, "Report on the Situation Analysis"; Hermez et al., "HIV/AIDS Prevention among Vulnerable Groups."

¹⁸¹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance (Round I)*.

¹⁸² Pakistan National AIDS Control Program, *HIV Second Generation Surveillance (Round II)*.

¹⁸³ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance (Round III)*.

¹⁸⁴ Syria Mental Health Directorate, "Assessment of HIV Risk."

Analytical summary

Injecting drug use is a persistent and a growing problem in MENA, with close to a million people injecting drugs: a population prevalence of 0.2%. MENA is a major source, route, and destination for the global trade in illicit drugs.

There is considerable evidence on HIV prevalence and risky behavior practices among IDUs in MENA. There is also evidence of rapidly rising HIV epidemics among IDUs in a few MENA countries. Earlier evidence suffered from methodological limitations, but the quality of evidence has increased significantly in recent years. Regardless, all evidence consistently indicates that HIV has already established itself among a number of IDU populations in MENA, while it is still at low or nil prevalence in other populations. Levels of HIV prevalence among populations where the infection is already established are comparable to those observed in other regions.

The levels of risky behavior practices, such as the use of nonsterile injecting equipment, have

been documented to be high, confirming the potential for further HIV spread among IDUs. The levels of HCV prevalence among IDUs have also been documented in the intermediate to high range, confirming the potential for further HIV spread. IDUs are sexually active and report high levels of risky sexual behavior, indicating substantial overlap of risks among the three key priority groups: IDUs, men who have sex with men (MSM), and FSWs. Levels of comprehensive HIV knowledge vary across the region, with both high and low levels documented in different settings.

The IDU risk context suggests the possibility of further concentrated HIV epidemics among IDUs in MENA over the next decade. The low or nil HIV prevalence in a number of IDU populations could be due to HIV not yet being introduced into these populations; HIV having been only recently introduced; or the nature of the injecting network structure among IDUs. There is an urgent need for HIV research to better understand transmission dynamics, risky behavior practices, and risk group sizes, and to be able to use this information to plan and implement more effective prevention and care services for IDUs.

Considering the above data, there are opportunities to prevent IDU epidemics in the region through needle exchange programs, access to frequent testing, prevention of heroin uptake, safe sex messages, and condom distribution.

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Men Who Have Sex with Men and HIV

This chapter focuses on the biological evidence for the extent of human immunodeficiency virus (HIV) spread among men who have sex with men (MSM), the behavioral evidence for sexual and injecting risk practices among this population group, and the context of homosexuality in the Middle East and North Africa (MENA).

HIV PREVALENCE AMONG MSM

HIV transmission between men who have sex with men has been reported in most MENA countries.¹ Table 3.1 describes the results of available point-prevalence surveys for MSM, including male sex workers (MSWs), *hijras*² (transgender individuals³), and *hijra* sex workers (HSWs). The available prevalence levels indicate a considerable HIV spread among MSM in MENA. Although some prevalence levels are low, this should not be interpreted as limited potential for future spread. HIV prevalence among *hijras* in one study in Pakistan was 0% in 1998, but syphilis prevalence was at 37%.⁴ This suggests substantial levels of sexual risk behavior and potential for HIV infectious spread if HIV is introduced into sexual networks involving

this population. This has been confirmed because recent data have shown some rapidly rising epidemics among MSWs and *hijras* in Pakistan.⁵ There is also a pattern of increasing HIV prevalence among MSM in other regions with a similar sociocultural background, such as in Indonesia in Southeast Asia.⁶

PREVALENCE OF HOMOSEXUALITY

Men who have sex with men form the most hidden and stigmatized risk group of all HIV risk groups in MENA. They are often subjected to harassment and even brutality.⁷ Homosexual identities existed throughout Arab and Islamic history and are well described, including celebrated historical figures.⁸ Arab and Islamic cultures treated homosexuals for much of history largely with indifference.⁹ Despite homophobic inclinations at the individual level, there was no presence historically of an ideology of homophobia similar to that which existed in the West.¹⁰ In

¹ WHO/EMRO Regional Database on HIV/AIDS; Jenkins and Robalino, "HIV in the Middle East and North Africa"; Schmitt and Sofer, *Sexuality and Eroticism*.

² Mainly in Pakistan and Afghanistan.

³ Bokhari et al., "HIV Risk in Karachi and Lahore, Pakistan."

⁴ Baqi et al., "Seroprevalence of HIV" (1999; 2006).

⁵ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Rounds I, II, and III).

⁶ Commission on AIDS in Asia, *Redefining AIDS in Asia*; Pisani et al., "HIV, Syphilis Infection, and Sexual Practices."

⁷ Yuzgun, "Homosexuality and Police Terror in Turkey"; Symington, "Egypt"; Moszynski, "Egyptian Doctors."

⁸ Al-Jahiz, *Letters of Al-Jahiz, Volume 2*; Abu-Nuwwas, *Poetry Collection of Abu-Nuwwas*; As-Siyuti, *History of the Caliphs*.

⁹ Boswell, *Christianity, Social Tolerance, and Homosexuality*.

¹⁰ Abukhalil, "Gender Boundaries and Sexual Categories in the Arab World."

Table 3.1 HIV Prevalence among MSM in MENA

Country	HIV prevalence among MSM
Egypt, Arab Republic of	1.4% (UNAIDS and WHO 2003; El-Rahman 2004; Family Health International 2007; El-Sayyed et al. 2008) 6.2% (Egypt MOH and Population National AIDS Program 2006)
Lebanon	3.6% (Mishwar 2008)
Morocco	4.4% (Alami 2009)
Pakistan	3.9% (MSWs; Bokhari et al. 2007) 0.0% (MSWs; Bokhari et al. 2007) 4.0% (MSWs; Bokhari et al. 2007) 0.4% (average of different cities with a range of 0–4.0; MSWs; Pakistan National AIDS Control Program 2005) 1.5% (average of different cities with a range of 0–7.5; MSWs; Pakistan National AIDS Control Program 2006–07) 0.9% (average of different cities with a range of 0–3.1; MSWs; Pakistan National AIDS Control Program 2008) 0.8% (average of different cities with a range of 0–1.6; HSWs; Pakistan National AIDS Control Program 2005) 1.8% (average of different cities with a range of 0–14.0; HSWs; Pakistan National AIDS Control Program 2006–07) 6.4% (average of different cities with a range of 0–27.6; HSWs; Pakistan National AIDS Control Program 2008) 1.5% (<i>hijras</i> ; Bokhari et al. 2007) 0.5% (<i>hijras</i> ; Bokhari et al. 2007) 0.0% (<i>hijras</i> ; Baqi et al. 1999) 1.0% (<i>hijras</i> ; Khan, A. A. et al. 2008) 0.5% (MSWs; <i>banthas</i> ^a ; Hawkes et al. 2009) 0.0% (MSWs; <i>banthas</i> ; Hawkes et al. 2009) 0.0% (MSWs; <i>khotkis</i> ^b ; Rawalpindi; Hawkes et al. 2009) 0.0% (MSWs; <i>khotkis</i> ; Abbottabad; Hawkes et al. 2009) 2.5% (MSWs; <i>khusras</i> ^c ; Hawkes et al. 2009) 0.0% (MSWs; <i>khusras</i> ; Hawkes et al. 2009)
Sudan	9.3% (Elrashied 2006)

a. Biological males with a male gender identity.

b. Biological males who dress as men but have “female soul” and feminized traits.

c. Transgenders who dress as women; they are often known as *hijras*.

medieval times, the regularity and apparent tolerance of male same-sex relations in the Arab and Islamic world were viewed in the West as a sign of moral decadence.¹¹

There are no reliable estimates of the number of MSM in MENA. “Ever engaging” in anal sex is probably a poor definition for MSM in the context of this region. Male same-sex sexual behavior in MENA should not be understood in terms of the Western paradigm of rigid distinction between homosexuals and heterosexuals despite recent Westernization of lifestyles.¹² Sexual identities are

more complex and intertwined and there is a full spectrum between these two distinctions.¹³

Drawing on the experience in India, gender segregation, delayed marriage, difficulty in accessing females for sex, and overcrowded living conditions can contribute to casual anal same-sex contacts.¹⁴ It is possibly not uncommon for adolescent boys to have sex with each other,¹⁵ for older men to pursue sex with boys,¹⁶ and for married men to have extramarital

¹³ Ibid.

¹⁴ Pappas et al., “Males Who Have Sex with Males.”

¹⁵ Busulwa, “HIV/AIDS Situation Analysis Study.”

¹⁶ Khawaja et al., “HIV/AIDS and Its Risk Factors in Pakistan.”

¹¹ Abukhalil, “Gender Boundaries and Sexual Categories in the Arab World.”

¹² Ibid.

homosexual relationships.¹⁷ Peer pressure at a young age and family instability were identified as reasons for engaging in same-sex anal sex and male sex work in Sudan.¹⁸

Male same-sex sexual behavior in MENA extends well beyond the concept of an active MSM population and takes multiple forms. In Pakistan, there is a complex tapestry of MSM activity including *hijras* or *khusras* (transvestites who dress as women and often practice male sex work), *khotkis* (biological males who dress as men but have “female soul” and feminized traits and who practice male sex work), *banthas* (biological males with a male gender identity who often practice male sex work), *zenanas* (she-males), *maalishias* (masseurs and mainly boys), and *chavas* (MSM who switch sex roles) among other forms.¹⁹

Various studies have documented same-sex anal sex among MENA populations. In the Arab Republic of Egypt, 77.4% of male street children reported ever having sex with males and 37.1% reported being forced to have sex with males.²⁰ In Lebanon, 8.4% of prisoners reported anal sex with a man in prison.²¹ In the Islamic Republic of Iran, 29% of single, sexually active males in Tehran reported homosexual contacts with no definition provided for the kind of contacts.²² In Pakistan, 11.3% of truck drivers reported ever having sex with an MSW, and 49.3% reported ever having sex with a man.²³ In another study, 21.9% of truck drivers had sex with a male or *hijra*.²⁴ Among truck drivers attending an STD (sexually transmitted disease) clinic, 53% reported anal sex with males.²⁵ Among prisoners, 26% reported sexual relations with other males prior to incarceration,²⁶ and among migrants, 1.7% reported ever having sex with a man.²⁷ History of urethritis

and genital ulcer disease among male prisoners was associated with same-sex anal sex.²⁸

In Sudan, 2% of males in mainly rural populations reported sex with males.²⁹ Among truck drivers, 0.2% reported having had sexual relations with both sexes, and 0.5% reported having had sex only with males.³⁰ Among prisoners, 2.2% reported having sex with males.³¹ Taking advantage of boys and unemployed males for anal sex has also been reported in Sudan.³² In the Republic of Yemen, it is estimated that there are 25,000 MSM, although there is no basis provided for this estimate.³³

There are also few estimates of the prevalence of commercial sex among men. In Pakistan, there were an estimated average of 2.3 MSWs and 2.4 HSWs per 1,000 adult men across different cities.³⁴ The range of prevalence varied from 1 to 4.8 per 1,000 adult men for MSWs and 0.4 to 3.7 per 1,000 adult men for HSWs.³⁵

These data on male same-sex sexual behavior suggest that the prevalence of homosexuality in MENA is comparable to global levels of a few percentage points of the male population engaging in anal sex with males.³⁶

MEN WHO HAVE SEX WITH MEN AND RISK BEHAVIOR

This section discusses risk behaviors and practices in relation to HIV among MSM, including sexual behavior and partnership formation, commercial sex, condom use, heterosexual sex, and injecting drug use. A few studies have also documented substantial levels of sexually transmitted infections (STIs) among MSM, suggesting potential for future HIV epidemics (see chapter 10 on STIs).

¹⁷ Khawaja et al., “HIV/AIDS and Its Risk Factors in Pakistan.”

¹⁸ Elrashied, “Generating Strategic Information.”

¹⁹ Hawkes et al., “HIV and Other Sexually Transmitted Infections”; Collumbien et al., “Understanding the Context”; Rajabali et al., “HIV and Homosexuality in Pakistan.”

²⁰ Egypt MOH and Population National AIDS Program, *HIV/AIDS Biological and Behavioral Surveillance Survey*.

²¹ Mishwar, “An Integrated Bio-Behavioral Surveillance Study.”

²² Ministry of Health and Medical Education of Iran, “Treatment and Medical Education.”

²³ Agha, “Potential for HIV Transmission.”

²⁴ Bokhari et al., “HIV Risk in Karachi and Lahore, Pakistan.”

²⁵ Khawaja et al., “HIV/AIDS and Its Risk Factors in Pakistan.”

²⁶ Baqi et al., “HIV Antibody Seroprevalence.”

²⁷ Faisal and Cleland, “Study of the Sexual Behaviours.”

²⁸ Akhtar and Luby, “Risk Behaviours.”

²⁹ SNAP, UNICEF, and UNAIDS, “Baseline Study.”

³⁰ Farah and Hussein, “HIV Prevalence.”

³¹ Assal, “HIV Prevalence.”

³² Ati, “HIV/AIDS/STIs Social and Geographical Mapping.”

³³ Al-Serouri, “Assessment of Knowledge.”

³⁴ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance (Round I)*.

³⁵ Ibid.

³⁶ McFarland and Caceres, “HIV Surveillance”; W. McFarland, personal communication (2008); UNAIDS, *Epidemiological Software and Tools*, http://www.unaids.org/en/KnowledgeCentre/HIVData/Epidemiology/epi_software2007.asp; Mercer et al., “Behaviourally Bisexual Men.”

Sexual behavior and partnerships

Evidence on sexual partnership formation among MSM indicates substantial risk behavior. In Egypt, 90% of MSM reported more than one sexual partner,³⁷ with 82% of MSM being insertive and 51% being receptive.³⁸ In another study, 65.8% of MSM took both receptive and insertive sexual roles, 24.8% had only receptive roles, and 8.2% were exclusively insertive.³⁹ Sixty-seven percent of MSM reported having five concurrent sexual partners,⁴⁰ and 80.8% had ever had sex with multiple partners per act.⁴¹ Being forced by their partners to practice anal sex in the last year was reported by 6.3% of MSM.⁴²

In the Islamic Republic of Iran, 81.9% of MSM reported different kinds of sexual partnerships in the last six months including steady, casual, commercial, and female partnerships.⁴³ Forty-six percent reported six or more sexual partnerships in the last six months, and 9.93% reported only one kind of sexual partnership.⁴⁴ The partners were described as steady in 61.2% of the cases, sex workers in 53.8%, and casual in 82.2%.⁴⁵ Being victimized in coercive sex was reported by 47.8% of MSM.⁴⁶ Also among these MSM, 43% had ever tested for HIV, 82.3% reported being imprisoned at least once (mainly for drug use), and 64% reported a history of suicide attempts.⁴⁷

In Lebanon, 74.3% of MSM reported having a regular sexual partner, 51.8% a casual partner, and 54.5% a commercial sex partner during the last month.⁴⁸ On average, MSM reported 9.47 partners in the past 12 months.⁴⁹ In Oman, MSM injecting drug users (IDUs) reported a mean number of two sexual partners.⁵⁰ In

Sudan, 97.2% of MSM reported more than one concurrent partner,⁵¹ and receptive MSM reported a mean of eight noncommercial partners in the last six months.⁵² In addition to anal sex, 57.2% of MSM in Sudan reported engaging in oral sex, with virtually all doing so without condoms.⁵³ In Tunisia, 90.1% of MSM reported multiple anal sex partners in the last six months and 12% paid for sex with MSWs.⁵⁴ Among South Asian men from Bangladesh, India, and Pakistan, MSM aged 14–16, 17–20, 21–35, and 36–45 years averaged 2, 5, 42, and 35 sex partners per year, respectively.⁵⁵

Male sex work

Sex work appears to be common among MSM in MENA who possibly use it to support their living in an environment of stigma and poor support networks.⁵⁶ Commercial sex among MSM was reported by various studies as 42%⁵⁷ and 20%⁵⁸ in Egypt, 36% in Lebanon,⁵⁹ and 67%⁶⁰ and 75.5%⁶¹ in Sudan.

The practice of MSW in MENA reflects an environment of high risk and of considerable overlap with female commercial sex networks (see section on overlap below). In Afghanistan, male sex work is secretive and occurs in small networks in the homes of clients at a frequency of three clients per day.⁶² In studies in Pakistan, MSWs reported an average of 2.3,⁶³ 2.1,⁶⁴ and 1.9⁶⁵ clients per working day, and an average of

³⁷ El-Sayed et al., "Evaluation of Selected Reproductive Health Infections."

³⁸ Egypt MOH and Population National AIDS Program, *HIV/AIDS Biological and Behavioral Surveillance Survey*.

³⁹ El-Sayed, Kabbash, and El-Gueniedy, "Risk Behaviours."

⁴⁰ El-Sayed et al., "Knowledge, Attitude, and Practice."

⁴¹ El-Sayed, Kabbash, and El-Gueniedy, "Risk Behaviours."

⁴² El-Sayed et al., "Knowledge, Attitude, and Practice."

⁴³ Eftekhari et al., "Bio-Behavioural Survey."

⁴⁴ Ibid.

⁴⁵ Ibid.

⁴⁶ Ibid.

⁴⁷ Ibid.

⁴⁸ Hermez et al., "HIV/AIDS Prevention among Vulnerable Groups"; Dewachi, "Men Who Have Sex with Other Men."

⁴⁹ Hermez et al., "HIV/AIDS Prevention among Vulnerable Groups."

⁵⁰ Oman MOH, "HIV Risk."

⁵¹ Anonymous, "Improving HIV/AIDS Response."

⁵² Elrashied, "Generating Strategic Information."

⁵³ Ibid.

⁵⁴ Hsairi and Ben Abdallah, "Analyse de la situation de vulnérabilité."

⁵⁵ Khan and Hyder, "HIV/AIDS among Men Who Have Sex with Men."

⁵⁶ International HIV/AIDS Alliance, "Spreading the Word."

⁵⁷ Egypt MOH and Population National AIDS Program, *HIV/AIDS Biological and Behavioral Surveillance Survey*.

⁵⁸ El-Sayed et al., "Knowledge, Attitude, and Practice."

⁵⁹ Mishwar, "An Integrated Bio-Behavioral Surveillance Study."

⁶⁰ Elrashied, "Prevalence, Knowledge and Related Risky Sexual Behaviours."

⁶¹ Anonymous, "Improving HIV/AIDS Response."

⁶² World Bank, "Mapping and Situation Assessment."

⁶³ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance (Round I)*.

⁶⁴ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance (Round II)*.

⁶⁵ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance (Round III)*.

31.1,⁶⁶ 25.8,⁶⁷ and 20.3⁶⁸ clients per month. In these same studies, HSWs reported an average of 2.5,⁶⁹ 2.5,⁷⁰ and 2.59⁷¹ clients per working day, and an average of 36.3,⁷² 32.0,⁷³ and 49.07⁷⁴ clients per month, respectively. In another study from Pakistan, different groups of MSWs reported a mean of 3.2 to 7.0 clients in the last week and a mean of 1.8 to 4.0 *new* clients in the last week.⁷⁵ The mean number of years in sex work was reported to be between 6.7 and 12.5 years.⁷⁶ *Hijras* constitute about one-quarter of all male sex workers in Pakistan.⁷⁷ Their clients are reported to be businessmen, drivers, students, police/military, rickshaw drivers, and the unemployed.⁷⁸

Also from studies in Pakistan, 51% of *hijras* reported new clients in the past week with a median of one, and 68% reported regular clients with a median of three.⁷⁹ Payment to anyone for anal sex was reported in several studies by 20%,⁸⁰ 10%,⁸¹ and 4.5%⁸² of MSWs; 21.1%⁸³ of HSWs; and 15%⁸⁴ of *hijras*. Noncommercial partners in the last month were reported in studies by 37.7%,⁸⁵

34.6%,⁸⁶ and 31.8%⁸⁷ of MSWs; 21.1%,⁸⁸ 32.9%,⁸⁹ and 44.0%⁹⁰ of HSWs; and 40%⁹¹ of *hijras*. Close to half of the MSWs and HSWs used alcohol or drugs during sex in the last six months⁹² or in the last month.⁹³ *Hijras* performed oral sex with 39% of their one-time clients and 42% of their regular clients.⁹⁴ Selling blood for money in the last six months was reported by 2.4% of MSWs and 1.6% of HSWs.⁹⁵

In further evidence from Pakistan, MSWs reported four clients in the last week and 28% reported having sex with a nonpaying male in the last month.⁹⁶ Twenty-seven percent to 32% of different groups of MSWs also reported paying to have sex with other males or *hijras* in the last month.⁹⁷ *Hijras* reported four partners in the last week,⁹⁸ and 95% of HSWs have had sex with other *hijras*.⁹⁹ Seventeen percent to 19% of MSWs reported selling blood for profit.¹⁰⁰ Most *hijras* (84%) in one study were found to have engaged in sex work within the last month and 99% within the last year.¹⁰¹ Increasingly among MSWs and HSWs in Pakistan, clients are found by roaming around in public places such as bus stops and markets, or through mobile phones and client referral, instead of through the traditional pimp or a *guru* (the leader or patron of a small group of *hijras*).¹⁰²

⁶⁶ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

⁶⁷ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

⁶⁸ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

⁶⁹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

⁷⁰ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

⁷¹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

⁷² Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

⁷³ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

⁷⁴ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

⁷⁵ Hawkes et al., "HIV and Other Sexually Transmitted Infections."

⁷⁶ Ibid.

⁷⁷ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I); Khan et al., "Correlates and Prevalence of HIV."

⁷⁸ Khan et al., "Correlates and Prevalence of HIV."

⁷⁹ Ibid.

⁸⁰ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

⁸¹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

⁸² Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

⁸³ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

⁸⁴ Khan et al., "Correlates and Prevalence of HIV."

⁸⁵ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

⁸⁶ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

⁸⁷ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

⁸⁸ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

⁸⁹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

⁹⁰ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

⁹¹ Khan et al., "Correlates and Prevalence of HIV."

⁹² Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Rounds I, II, and III).

⁹³ Hawkes et al., "HIV and Other Sexually Transmitted Infections."

⁹⁴ Khan et al., "Correlates and Prevalence of HIV."

⁹⁵ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

⁹⁶ Bokhari et al., "HIV Risk in Karachi and Lahore, Pakistan."

⁹⁷ Ibid.

⁹⁸ Ibid.

⁹⁹ Khan et al., "Correlates and Prevalence of HIV."

¹⁰⁰ Pakistan National AIDS Control Program, "Pilot Study in Karachi & Rawalpindi."

¹⁰¹ Khan et al., "Correlates and Prevalence of HIV."

¹⁰² Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Rounds I, II, and III).

In Sudan, 63.7% of MSM reported being forced to have anal sex; that anal sex was necessary to secure employment, alcohol, or drugs; or that sex work was practiced for financial reasons.¹⁰³ About 25% of receptive MSM had at least 1 commercial sex partner per day with a mean of 10 insertive partners in the last six months.¹⁰⁴ Seventy-one percent of MSM reported a commercial sex partner in the last six months.¹⁰⁵ A study among female sex workers (FSWs) in Sudan reported that FSWs host young MSWs in their houses to offer both heterosexual and homosexual sex to clients who wish to engage in both activities.¹⁰⁶

MSWs and HSWs report other sources of income. The majority of MSWs and HSWs in Pakistan reported working as laborers, factory workers, bus/van conductors, tailors, shopkeepers, beggars, dancers, and *malishi* (masseurs).¹⁰⁷ Close to half of MSWs and HSWs were illiterate.¹⁰⁸ High levels of sexual abuse were reported among *hijras* in Pakistan. Between 12% and 27% of different MSW and HSW groups reported being sexually violated by police in the last year, and between 24% and 39% reported providing free sex to police in the last year.¹⁰⁹ Between 10% and 18% of these MSWs and HSWs reported that their first sex was forced.¹¹⁰

Condom use

Reported condom use among MSM varies substantially, although overall it is more on the low side. In different studies in Egypt, 19% of MSM regularly used condoms¹¹¹; 2%,¹¹² 19%,¹¹³ and 19.2%¹¹⁴ used condoms consistently; and 9.2% used condoms during last commercial sex.¹¹⁵ Twenty-two percent of MSM in Egypt reported

difficulty in obtaining condoms and 38% reported difficulty using them,¹¹⁶ but three quarters of MSM had heard of male condoms.¹¹⁷ In studies in the Islamic Republic of Iran, 19.4%, 59.5%, and 59.9% of MSM used condoms during last anal sex with steady partners, commercial sex partners, and casual partners, respectively.¹¹⁸ In Lebanon, two studies found that 47.1% and 54.5% of MSM always used condoms with regular partners and noncommercial casual partners, respectively.¹¹⁹ In Oman, 68%–100% of different groups of MSM IDUs used condoms in the last year.¹²⁰

In Pakistan, condom use during last anal sex with a client was reported by 24% of MSWs and 21% of HSWs.¹²¹ Condom use during last oral sex with a client was reported by 13% of MSWs and 15% of HSWs.¹²² Among MSWs, 34.7% reported condom use at last sex with a paying client and 32.5% with a nonpaying partner.¹²³ For HSWs, the percentages were 32.3 and 26, respectively.¹²⁴ Studies reported consistent condom use in the last month by 7.2%¹²⁵ and 8%¹²⁶ of MSWs, and 5.6%¹²⁷ and 7.5%¹²⁸ of HSWs. In further studies, 4% of *hijras* and 3.1% of MSWs used condoms consistently,¹²⁹ and 17% of MSWs used a condom with a nonpaying female in the last month.¹³⁰ Among the reasons cited for not using condoms among MSM in Pakistan are not liking them, partners' objection, lack of availability, and not thinking of them as necessary.¹³¹

¹⁰³ Elrashied, "Generating Strategic Information."

¹⁰⁴ Ibid.

¹⁰⁵ Ibid.

¹⁰⁶ Yousif, "Health Education Programme."

¹⁰⁷ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Rounds I, II, and III).

¹⁰⁸ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Rounds I and II).

¹⁰⁹ Hawkes et al., "HIV and Other Sexually Transmitted Infections."

¹¹⁰ Ibid.

¹¹¹ El-Rahman, "Risky Behaviours for HIV/AIDS Infection."

¹¹² El-Sayed et al., "Knowledge, Attitude, and Practice."

¹¹³ El-Sayed et al., "Evaluation of Selected Reproductive Health Infections."

¹¹⁴ El-Sayyed, Kabbash, and El-Gueniedy, "Risk Behaviours."

¹¹⁵ Egypt MOH and Population National AIDS Program, *HIV/AIDS Biological and Behavioral Surveillance Survey*.

¹¹⁶ El-Sayed et al., "Evaluation of Selected Reproductive Health Infections."

¹¹⁷ Egypt MOH and Population National AIDS Program, *HIV/AIDS Biological and Behavioral Surveillance Survey*.

¹¹⁸ Eftekhari et al., "Bio-Behavioural Survey."

¹¹⁹ Hermez et al., "HIV/AIDS Prevention among Vulnerable Groups"; Dewachi, "Men Who Have Sex with Other Men."

¹²⁰ Oman MOH, "HIV Risk."

¹²¹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹²² Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹²³ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

¹²⁴ Ibid.

¹²⁵ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹²⁶ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹²⁷ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹²⁸ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹²⁹ Saleem, Adrien, and Razaque, "Risky Sexual Behavior."

¹³⁰ Bokhari et al., "HIV Risk in Karachi and Lahore, Pakistan."

¹³¹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

In Sudan, 50.9% of MSM used condoms every time or almost every time, 58.5% used a condom during last sex with a commercial sex partner, 48.5% used a condom during last sex with a non-commercial partner, and 72.9% had ever used condoms. Among these MSM, 89.4% used condoms when they had sex with females during the last six months.¹³² Over 50% of MSM in Sudan were not aware of the risk of HIV transmission in unprotected anal intercourse and 85.3% did not use condoms because they were not available.¹³³ In Tunisia, 46.4% of MSM used condoms during last nonpaid sex; 19.7% of MSM used condoms consistently during nonpaid sex¹³⁴; 53.7% of MSM used condoms consistently during sex with females; 55.4% of MSM used condoms during last paid sex; and 4.3% used condoms consistently during paid anal sex.¹³⁵ Further data on condom use among MSM can be found in table 8.1.

The evidence summarized above suggests that the majority of anal same-sex acts in MENA are unprotected against HIV.

Engagement of MSM in heterosexual risk behavior

Several studies have documented a considerable overlap between homosexual sex and heterosexual sex in MENA, thereby allowing HIV to spread between homosexual and heterosexual risk networks. In Egypt, ever having sex with FSWs was reported by 73.3% of MSM older than 25 years¹³⁶ and 29.3% of younger MSM.¹³⁷ Forty-four percent of MSM were found to be bisexually active.¹³⁸ Also in Egypt, studies reported current marriage to a female partner by 5.6%¹³⁹ and 30%¹⁴⁰ of MSM, ever being married was reported by 13%,¹⁴¹ and ever having sex with a female was reported by 56.2%.¹⁴² In the Islamic Republic of Iran, 51.8% of

MSM reported ever being married, 87.7% reported having female partners in the last six months, and 14.5% reported living currently with a female partner.¹⁴³ In Lebanon, 52.2% of MSM reported ever having a female sex partner.¹⁴⁴

In Pakistan, three studies reported, respectively, that 14.7%,¹⁴⁵ 12.4%,¹⁴⁶ and 10.5%¹⁴⁷ of MSWs, and 15.3%,¹⁴⁸ 17.4%,¹⁴⁹ and 12.2%¹⁵⁰ of HSWs were married. In another study, 8% of *hijras* were married and 20% have had sex with a woman.¹⁵¹ Also in Pakistan, a study reported that 10%–19% of different groups of MSWs and HSWs were married.¹⁵² Paying a female for sex in the last month was reported by 42.7% of MSWs in one study,¹⁵³ and 12%–39% of MSWs in another study.¹⁵⁴ Nine percent to 24% of MSWs had also had sex with a nonpaying female in the last month.¹⁵⁵ In studies in Sudan, 22.9% of MSM reported ever being married,¹⁵⁶ 17.3% reported currently being married,¹⁵⁷ and 61.2%¹⁵⁸ and 69.2%¹⁵⁹ reported ever having sex with a female.¹⁶⁰ In Tunisia, 31.1% of MSM reported having sex with females.¹⁶¹

Female sexual partners of MSM are vulnerable to HIV. The presence of heterosexual marriage among MSM, and generally sexual contacts with female partners, puts these partners at risk of HIV infection.¹⁶²

¹³² Elrashied, "Generating Strategic Information."

¹³³ Elrashied, "Prevalence, Knowledge and Related Risky Sexual Behaviours."

¹³⁴ Hsairi and Ben Abdallah, "Analyse de la situation de vulnérabilité."

¹³⁵ *Ibid.*

¹³⁶ El-Rahman, "Risky Behaviours for HIV/AIDS Infection"; El-Sayyed, Kabbash, and El-Gueniedy, "Risk Behaviours."

¹³⁷ El-Sayyed, Kabbash, and El-Gueniedy, "Risk Behaviours."

¹³⁸ El-Sayed et al., "Knowledge, Attitude, and Practice."

¹³⁹ Egypt MOH and Population National AIDS Program, *HIV/AIDS Biological and Behavioral Surveillance Survey*.

¹⁴⁰ El-Sayed et al., "Knowledge, Attitude, and Practice."

¹⁴¹ Egypt MOH and Population National AIDS Program, *HIV/AIDS Biological and Behavioral Surveillance Survey*.

¹⁴² *Ibid.*

¹⁴³ Eftekhari et al., "Bio-Behavioural Survey."

¹⁴⁴ Hermez et al., "HIV/AIDS Prevention among Vulnerable Groups."

¹⁴⁵ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹⁴⁶ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹⁴⁷ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

¹⁴⁸ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹⁴⁹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹⁵⁰ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

¹⁵¹ Khan et al., "Correlates and Prevalence of HIV."

¹⁵² Hawkes et al., "HIV and Other Sexually Transmitted Infections."

¹⁵³ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

¹⁵⁴ Bokhari et al., "HIV Risk in Karachi and Lahore, Pakistan."

¹⁵⁵ *Ibid.*

¹⁵⁶ Elrashied, "Generating Strategic Information."

¹⁵⁷ *Ibid.*

¹⁵⁸ *Ibid.*

¹⁵⁹ Anonymous, "Improving HIV/AIDS Response."

¹⁶⁰ Elrashied, "Generating Strategic Information."

¹⁶¹ Hsairi and Ben Abdallah, "Analyse de la situation de vulnérabilité."

¹⁶² Jenkins, "Male Sexual Diversity and Culture"; Khilji, "Combating HIV/AIDS amongst Zenana Youth."

Engagement of MSM in injecting drug risk behavior

MSM report considerable levels of drug use, both in injecting and noninjecting forms. In Egypt, 10.9% of MSM injected drugs in the previous 12 months and 79.3% reported ever using noninjecting drugs.¹⁶³ In the Islamic Republic of Iran, 53% of MSM injected drugs in the last month and hepatitis C virus (HCV) prevalence was high at 48.8%, attesting to the overlap between MSM and IDU risk factors.¹⁶⁴ Studies in Pakistan reported that 4%–17%¹⁶⁵ and 1%–2%¹⁶⁶ of *hijras* and 7%–9%¹⁶⁷ and 4%¹⁶⁸ of MSWs injected drugs. Also in Pakistan, studies reported that 5%,¹⁶⁹ 5.2%,¹⁷⁰ and 4.2%¹⁷¹ of MSWs and 5.3%,¹⁷² 6.3%,¹⁷³ and 4.6%¹⁷⁴ of HSWs injected drugs in the last six months. Further reported by these studies, 10.1%,¹⁷⁵ 9.5%,¹⁷⁶ and 4.2%¹⁷⁷ of MSWs and 8.4%,¹⁷⁸ 6.4,¹⁷⁹ and 6.3%¹⁸⁰ of HSWs had sex with IDUs in the last six months. In yet another study in Pakistan, between 0% and 3% of different groups of MSWs reported IDU in the last year, between

19% and 25% reported IDU sex partners in the last year, and between 0% and 2% had a husband or lover who is an IDU.¹⁸¹ In Sudan, 24.4% of MSM used drugs.¹⁸² In Tunisia, 14.7% of MSM reported IDU within the last year.¹⁸³

KNOWLEDGE OF HIV/AIDS

Levels of HIV knowledge among MSM in MENA appear to vary, probably reflecting the socioeconomic status of each MSM group. In Egypt, almost all MSM in one study have heard of HIV/AIDS and the majority were able to identify several transmission modes, but about one-quarter of MSM had misconceptions.¹⁸⁴ In the Islamic Republic of Iran, 82.4% of MSM were aware of HIV/AIDS and 50.6% knew of someone who was living with HIV.¹⁸⁵ Seventy-five percent also knew that they can protect themselves by using condoms, and 87.4% knew of the risk of infection from using nonsterile injecting equipment.¹⁸⁶ In Lebanon, almost all MSM were aware of HIV/AIDS, its transmission modes, the condom's role in prevention, and other prevention measures, but 43.3% perceived no chance of becoming infected with HIV.¹⁸⁷ Separate studies in Pakistan found that 72.1%,¹⁸⁸ 63.5%,¹⁸⁹ and 62.1%¹⁹⁰ of MSWs perceived no risk of HIV infection. Among HSWs, the percentages were 83.7,¹⁹¹ 77.8,¹⁹² and 59.2.¹⁹³ In Sudan, 98.3% of MSM have heard of HIV/AIDS,¹⁹⁴ but misconceptions were prevalent.¹⁹⁵ Some MSM harbored the belief that keeping to an insertive role

¹⁶³ Egypt MOH and Population National AIDS Program, *HIV/AIDS Biological and Behavioral Surveillance Survey*.

¹⁶⁴ Eftekhari et al., "Bio-Behavioural Survey."

¹⁶⁵ Pakistan National AIDS Control Program, "Pilot Study in Karachi & Rawalpindi."

¹⁶⁶ Bokhari et al., "HIV Risk in Karachi and Lahore, Pakistan."

¹⁶⁷ Pakistan National AIDS Control Program, "Pilot Study in Karachi & Rawalpindi."

¹⁶⁸ Bokhari et al., "HIV Risk in Karachi and Lahore, Pakistan."

¹⁶⁹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹⁷⁰ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹⁷¹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

¹⁷² Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹⁷³ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹⁷⁴ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

¹⁷⁵ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹⁷⁶ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹⁷⁷ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

¹⁷⁸ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹⁷⁹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹⁸⁰ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

¹⁸¹ Hawkes et al., "HIV and Other Sexually Transmitted Infections."

¹⁸² Elrashied, "Generating Strategic Information."

¹⁸³ Hsairi and Ben Abdallah, "Analyse de la situation de vulnérabilité."

¹⁸⁴ Egypt MOH and Population National AIDS Program, *HIV/AIDS Biological and Behavioral Surveillance Survey*.

¹⁸⁵ Eftekhari et al., "Bio-Behavioural Survey."

¹⁸⁶ *Ibid.*

¹⁸⁷ Hermez et al., "HIV/AIDS Prevention among Vulnerable Groups"; Dewachi, "Men Who Have Sex with Other Men."

¹⁸⁸ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹⁸⁹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹⁹⁰ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

¹⁹¹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹⁹² Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹⁹³ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

¹⁹⁴ Anonymous, "Improving HIV/AIDS Response."

¹⁹⁵ Elrashied, "Generating Strategic Information."

protects fully from HIV infection and most MSM believed that the risk of contracting HIV through anal sex was smaller than that of vaginal sex.¹⁹⁶

ANALYTICAL SUMMARY

Although evidence is still limited, there has been a considerable increase in knowledge relating to MSM and HIV in MENA in the last few years. MSM are the most hidden and stigmatized risk group of all HIV risk groups. Nevertheless, homosexuality exists in this region at levels comparable to those in other regions, with a small percentage of the male population engaging in anal sex with males.

HIV has already been documented to be spreading among MSM, with apparently a rapidly rising epidemic in at least one country (Pakistan). HIV prevalence among MSM is already at considerable levels in several other countries, but data are still too limited to document the trend. Data on risk behaviors indicate high levels of sexual risk behavior such as multiple sexual partnerships of different kinds, low condom use, and high prevalence of sex work among MSM. MSM risk behaviors overlap considerably with heterosexual sex and injecting drug risk behaviors. Levels of STIs prevalence are substantial, suggesting epidemic potential for HIV. Levels of comprehensive HIV knowledge vary across the region, with both high and low levels being documented in different settings.

The MSM risk context suggests the possibility of concentrated HIV epidemics among MSM as well as HIV infections among their female partners over the next decade. Indeed, there may already be concentrated HIV epidemics among MSM in several MENA countries, but definitive and conclusive data are lacking. There is an urgent need for HIV surveillance to better understand the transmission dynamics and to plan and implement more effective prevention and care services among MSM in MENA.

The key to preventing a considerable HIV epidemic among MSM is expanding prevention and treatment efforts, such as condom distribution, counseling, HIV testing, and social and medical services.

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Commercial Sex and HIV

This chapter focuses on the biological evidence for the extent of human immunodeficiency virus (HIV) spread among female sex workers (FSWs), the behavioral evidence for sexual and injecting risk practices among this population group, and the context of commercial sex in the Middle East and North Africa (MENA).¹

HIV PREVALENCE AMONG FSWs

There is documented evidence of some HIV spread among FSWs in MENA. Table 4.1 contains the results of the available point-prevalence surveys conducted among FSWs. Generally speaking, HIV prevalence continues to be at low levels among FSWs in most countries, though at levels much higher than those in the general population (chapter 6). HIV does not appear to be well established among many commercial sex networks in MENA. In three countries, Djibouti, Somalia, and Sudan, HIV prevalence for FSWs has reached high levels in at least parts of these countries, but still at lower levels than those found in hyperendemic HIV epidemics in sub-Saharan Africa.²

Repeatedly in MENA, there are reports of men becoming infected from FSWs. Among reported cases in Saudi Arabia, about 90% of the men who were infected with HIV heterosexually received the infection from FSWs, with the remaining 10% becoming infected from their wives.³ HIV prevalence in Southern Sudan

was 14% among men who reported sexual contacts with an FSW, but was 0% among men who denied such contacts.⁴

CONTEXT OF COMMERCIAL SEX IN MENA

This section highlights key social, economic, and political factors that force women to engage in sex work in MENA. This profession should not be seen as either strictly voluntary or forced,⁵ and it must be understood in terms of livelihood and gender perspective.⁶ Lack of marketable skills, low educational level, inability to engage in meaningful economic activity, lack of viable alternatives, and higher income through sex work are key factors in preventing FSWs from seeking other alternative professions and are contributing to their marginalization.⁷ Social and economic stresses, including drug use, divorce, legal and social restrictions on women's work, family troubles leading to runaway girls, domestic violence, history of being abused, survival while husband is in jail and unemployment, are increasingly forcing women to engage in sex work in MENA.⁸

⁴ McCarthy, Khalid, and El Tigani, "HIV-1 Infection in Juba, Southern Sudan."

⁵ ACORD, "Socio Economic Research."

⁶ ACORD, "Qualitative Socio Economic Research."

⁷ Ati, "HIV/AIDS/STIs Social and Geographical Mapping"; ACORD, "Qualitative Socio Economic Research."

⁸ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance in Pakistan* (Rounds I and II); Razzaghi et al., "Profiles of Risk"; Jenkins, "Report on Sex Worker Consultation in Iran"; Saleem, Adrien, and Razaque, "Risky Sexual Behavior"; Štulhofer and Božicevic, "HIV Bio-Behavioural Survey"; Sepehrad, "The Role of Women"; Dareini, "Rise in Iranian Prostitution"; Daher and Zayat, "A Matter of Life."

¹ Male sex workers (MSWs) are included among MSM.

² Morison et al., "Commercial Sex and the Spread of HIV."

³ Alrajhi, Halim, and Al-Abdely, "Mode of Transmission of HIV-1."

Table 4.1 HIV Prevalence among FSWs in MENA

Country	HIV prevalence among FSWs
Afghanistan	0.0% (World Bank 2008)
Algeria	1.7% (Fares et al. 2004; Institut de Formation Paramédicale de Parnet 2004) 2.0% (Fares et al. 2004) 9.0% (Fares et al. 2004) 10.0% (Unknown, "Statut de la réponse nationale") 3.0% (Algeria MOH [unknown]) 4.0% (Algeria MOH [unknown]) 2.8% (Alami 2009) 3.7% (Alami 2009) 3.9% (Alami 2009) 6.9% (Alami 2009) 10.7% (Alami 2009) 10.0% (Alami 2009)
Djibouti	3.9% (street-based; Etchepare 2001) 9.0% (street-based; Etchepare 2001) 41.4% (street-based; Etchepare 2001) 39.5% (street-based; Etchepare 2001) 51.3% (street-based; Etchepare 2001) 55.8% (street-based; Etchepare 2001) >50.0% (street-based; Etchepare 2001) 2.0% (Fox et al. 1989) 4.6% (street-based; Rodier et al. 1993) 41.7% (street-based; Rodier et al. 1993) 41.0% (street-based; Rodier et al. 1993) 36.0% (street-based; Rodier et al. 1993) 70.0% (street-based; Marcelin et al. 2001; Marcelin et al. 2002) 1.4% (bar-based; Etchepare 2001) 2.7% (bar-based; Etchepare 2001) 5.0% (bar-based; Etchepare 2001) 7.0% (bar-based; Marcelin et al. 2001; Marcelin et al. 2002) 14.2% (bar-based; Etchepare 2001) 15.3% (bar-based; Rodier et al. 1993) 21.7% (bar-based; Etchepare 2001) 25.6% (bar-based; Etchepare 2001) ≈50% (Philippon et al. 1997)
Egypt, Arab Republic of	0.8% (Egypt MOH and Population National AIDS Program 2006) 0.0% (Watts et al. 1993)
Iran, Islamic Republic of	0.0% (Jahani et al. 2005) 0.0% (Tassie [unknown]) 2.67% (WHO/EMRO Regional Database on HIV/AIDS)
Lebanon	0.0% (Mishwar 2008)
Morocco	1.4% (WHO/EMRO Regional Database on HIV/AIDS) 2.3% (Morocco MOH 2003–04, 2005; Khattabi and Alami 2005) 3.14% (Khattabi and Alami 2005) 2.03% (Khattabi and Alami 2005) 2.95% (Khattabi and Alami 2005) 2.52% (Khattabi and Alami 2005) 2.36% (Khattabi and Alami 2005) 0.9% (female prisoners imprisoned for sex work; Khattabi and Alami 2005) 0.0% (female prisoners imprisoned for sex work; Morocco MOH 2007) 4.41% (Khattabi and Alami 2005) 0.0% (Khattabi and Alami 2005) 1.95% (Khattabi and Alami 2005) 2.1% (Alami 2009) 0.33% (Morocco MOH 2007) 0.0% (Morocco MOH 2007)

Table 4.1 (Continued)

Country	HIV prevalence among FSWs
Pakistan	0.0% (Iqbal and Rehan 1996) 0.0% (Baqi et al. 1998) 0.0% (Bokhari et al. 2007) 0.5% (Bokhari et al. 2007) 0.2% (Pakistan National AIDS Control Program 2005) 0.02% (Pakistan National AIDS Control Program 2006–07) 0.2% (UNFPA 2009) 0.0% (Rawalpindi; Hawkes et al. 2009) 0.0% (Abbottabad; Hawkes et al. 2009)
Somalia	0.0% (Jama et al. 1987) 0.0% (Burans et al. 1990) 2.1% (Watts et al. 1994) 2.4% (Corwin et al. 1991) 8.3% (Corwin et al. 1991) 0.0% (Corwin et al. 1991) 0.6% (Ahmed et al. 1991) 5.2% (Testa and Kriitmaa 2009)
Sudan	0.0% (Burans et al. 1990) 16.0% (Southern Sudan; McCarthy, Khalid, and El Tigani 1995) 4.4% (Ahmed 2004d) 1.55% (FSWs and tea sellers; Basha 2006) 1.7% (Anonymous 2007)
Tunisia	2.3% (UNAIDS 2008)
Turkey	0.0% (Orak, Dalkiic, and Ozbal 1991) 0.0% (Gul et al. 2008) 0.0% (Tiras et al. 1998)
Yemen, Republic of	4.5% (Al-Serouri 2005; WHO, UNICEF, and UNAIDS 2006) 2.7% (Al-Serouri 2005; WHO, UNICEF, and UNAIDS 2006) 7.0% (Al-Serouri 2005; WHO, UNICEF, and UNAIDS 2006; Al-Qadhi 2001) 1.3% (Štulhofer and Božicevic 2008)

Economic pressures, acute poverty, and mere survival are repeatedly cited as the main immediate factors leading women to engage in sex work.⁹ Sex work is the only source of income for a large fraction of sex workers,¹⁰ and FSWs often carry the burden of supporting several children, husbands, parents, and other relatives, in addition to supporting themselves.¹¹ The payment for sex work is sometimes made not by cash, but rather by consumable commodities such as food and clothes, highlighting the sur-

vival nature of some of the sex work in MENA.¹²

Family disruption leading to economic pressure is often cited as a key cause of sex work. Failure in marriage, punishing husband or family out of grievances, and being forced by a husband or other male relatives to do sex work are commonly reported.¹³ FSWs often report being lured into this profession by people close to them.¹⁴ Male pimps are often the father, husband, or boyfriend of the FSW.¹⁵

⁹ Busulwa, "HIV/AIDS Situation Analysis Study"; Ati, "HIV/AIDS/STIs Social and Geographical Mapping"; ACORD, "Socio Economic Research"; ACORD, "Qualitative Socio Economic Research"; Zargooshi, "Characteristics of Gonorrhoea."

¹⁰ Anonymous, "Improving HIV/AIDS Response"; ACORD, "Socio Economic Research"; Syria National AIDS Programme, "HIV/AIDS Female Sex Workers."

¹¹ Ati, "HIV/AIDS/STIs Social and Geographical Mapping"; ACORD, "Socio Economic Research"; ACORD, "Qualitative Socio Economic Research."

¹² ACORD, "Socio Economic Research"; ACORD, "Qualitative Socio Economic Research."

¹³ Busulwa, "HIV/AIDS Situation Analysis Study"; ACORD, "Socio Economic Research"; ACORD, "Qualitative Socio Economic Research"; Daher and Zayat, "A Matter of Life"; Syria National AIDS Programme, "HIV/AIDS Female Sex Workers."

¹⁴ Yousif, "Health Education Programme"; Syria National AIDS Programme, "HIV/AIDS Female Sex Workers."

¹⁵ Soins Infirmiers et Développement Communautaire, "Mapping for FSW and IDU Report."

FSWs in MENA often report high levels of sexual violence and abuse.¹⁶ The abuse takes different forms including verbal, physical, sexual, or being pimped against their will.¹⁷ The perpetrators of the abuse are often clients, husbands, lovers, and neighbors as well as the police and other state actors.¹⁸ Eight percent of FSWs in Pakistan in one study reported being sexually violated by police in the last year and 35% reported providing free sex to police in the last year.¹⁹ Five percent of these FSWs reported that their first sex was forced.²⁰

Political conflicts and social and economic inequalities also fuel sexual exploitation and trafficking of women across national boundaries.²¹ Several countries in MENA are source or transit countries for women and children trafficked for the purpose of sexual exploitation at destination countries within MENA.²² The occupation of Iraq in 2003 has led to abductions of women and girls to be sold for prostitution, or being violently forced to engage in sex work for survival or because of economic necessity, both inside Iraq and in neighboring countries.²³

Though the vast majority of sex work in MENA is driven by economic necessity, there is evidence of “means-to-an-end” or lifestyle sex work involving middle class young women who use commercial sex to pay for education fees while attending universities, or to attain social prestige by purchasing luxury goods to maintain a higher lifestyle.²⁴ The recent rapid increase in the age at marriage among women creates a window of vulnerability where women may succumb to sex work with the lure of incentives and presents.²⁵ Young women sometimes find

themselves trapped or tricked into sex work by friends and colleagues already involved in sex work, either as a cover-up of their activities or as a silencing tactic.²⁶

FORMS OF COMMERCIAL SEX

Sex work is prevalent all over MENA and its forms are changing rapidly due to the changes in the socioeconomic conditions and the use of modern communications, such as mobile phones. Commercial sex, long an invisible trade in this part of the world, is now becoming visible in large cities, even in once very conservative and traditional societies.²⁷ It is taking place at different venues including homes, hotels, nightclubs, streets, brothels, Kothikhana (“grand houses”),²⁸ client homes,²⁹ massage parlors, “pimp”-run or individually run permanent houses,³⁰ “red flats,”³¹ beaches,³² rental houses near army bases and market places,³³ truck stops,³⁴ and in bazaars.³⁵

As in other regions, commercial sex has a complex tapestry and it is difficult to provide a clear-cut definition of this practice as it involves contacts with sex workers, other forms of transactional sex, and other nonregular sexual contacts.³⁶ It takes a variety of forms, including that of street children and runaway adolescents controlled by older adults³⁷; high-class mobile FSWs³⁸; mobile-phone networks³⁹; “call girls”⁴⁰;

²⁶ Ibid.

²⁷ Busulwa, “HIV/AIDS Situation Analysis Study”; Jenkins, “Report on Sex Worker Consultation in Iran.”

²⁸ Kothikhana are generally small premises that are rented by a madam and/or broker where a small number of FSWs engage in sex work (Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* [Rounds I, II, and III]); Blanchard, Khan, and Bokhari, “Variations in the Population Size.”

²⁹ ACORD, “Socio Economic Research.”

³⁰ Ati, “HIV/AIDS/STIs Social and Geographical Mapping.”

³¹ El-Gawhary, *Sex Tourism in Cairo*.

³² Štulhofer and Božicevic, “HIV Bio-Behavioural Survey.”

³³ ACORD, “Socio Economic Research”; ACORD, “Qualitative Socio Economic Research.”

³⁴ Štulhofer and Božicevic, “HIV Bio-Behavioural Survey.”

³⁵ World Bank, “Mapping and Situation Assessment.”

³⁶ Morison et al., “Commercial Sex”; Carael et al., “Clients of Sex Workers”; Lowndes et al., “Role of Core and Bridging Groups”; Aral and St. Lawrence, “The Ecology of Sex Work and Drug Use”; Aral et al., “The Social Organization of Commercial Sex.”

³⁷ Ati, “HIV/AIDS/STIs Social and Geographical Mapping.”

³⁸ Ibid.

³⁹ Busulwa, “HIV/AIDS Situation Analysis Study.”

⁴⁰ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹⁶ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I and II); Mayhew et al., “Protecting the Unprotected”; Štulhofer and Božicevic, “HIV Bio-Behavioural Survey”; Syria National AIDS Programme, “HIV/AIDS Female Sex Workers.”

¹⁷ Mayhew et al., “Protecting the Unprotected.”

¹⁸ Ibid.

¹⁹ Hawkes et al., “HIV and Other Sexually Transmitted.”

²⁰ Ibid.

²¹ Huda, “Sex Trafficking in South Asia.”

²² Ibid.

²³ Al-Ali, “Reconstructing Gender”; Al-Ali, “Iraqi Women: Untold Stories”; Hassan, “Iraqi Women under Occupation.”

²⁴ Busulwa, “HIV/AIDS Situation Analysis Study”; Algeria MOH, *Rapport de l'enquête nationale de séro-surveillance*; Jenkins, “Report on Sex Worker Consultation in Iran”; Ati, “HIV/AIDS/STIs Social and Geographical Mapping.”

²⁵ Ati, “HIV/AIDS/STIs Social and Geographical Mapping.”

sex work covered under other professions⁴¹; arrangement for clients through pimps/aunty⁴²; reliance on older clients⁴³; solicitation of sex at truck stops⁴⁴; FSWs accompanying truck drivers for a whole trip⁴⁵; and arranging for clients through taxis. In the more conservative parts of MENA, sex work is often based at homes with interaction with clients through phones, such as in Afghanistan.⁴⁶ Increasingly mobile phones are used to facilitate sex work, such as through female brokers in the Arab Republic of Egypt,⁴⁷ or simply by direct phone contacts with clients such as in Pakistan.⁴⁸ This is leading to a larger dispersion of the FSW population into the community.⁴⁹

PREVALENCE OF COMMERCIAL SEX

Knowledge of the sizes of commercial sex networks, including group size estimations of FSWs and the proportion of men who sexually contact FSWs, is needed to assess the HIV epidemic potential and to estimate the resources needed for HIV prevention in this priority group.

FSWs risk group size estimation

There are no reliable estimates of the number of FSWs in MENA. Globally speaking, sex work varies widely across regions and can be as high as 7% of the female population.⁵⁰ Sex workers are never a negligible part of the total population of a community.⁵¹

It is estimated that there are 30,000 to 60,000 FSWs in the Islamic Republic of Iran.⁵² It is also estimated that there are 5,000 FSWs in

the Republic of Yemen,⁵³ and 1,500 street-based FSWs in Djibouti.⁵⁴ In the three cities of Kabul, Jalalabad, and Mazar-i-Sharif in Afghanistan, there are an estimated 1,160 FSWs, including 898 in Kabul alone.⁵⁵

Few estimates are available on the prevalence of sex work among women in MENA. In three cities in Afghanistan, there were on average 1.9 FSWs per 1,000 women, with the highest concentration in Mazar-i-Sharif at 2.8 FSWs per 1,000 women.⁵⁶ In a study among hospital attendees in Morocco, 0.5% reported engaging in sex work.⁵⁷ In Pakistan, mapping has found that there are between 4.5 and 12.6 FSWs per 1,000 adult women, or between 4.2 and 11.4 FSWs per 1,000 adult men.⁵⁸ In Sudan, 1.4% of females in a mainly rural population reported engaging in commercial sex.⁵⁹ Also in Sudan, exchanging sex for money was reported by 0.5% of antenatal clinic (ANC) women attendees⁶⁰ and 1% of tea sellers.⁶¹

The above estimates suggest that the ratio of women in MENA who engage in sex work may range from about 1 to 10 FSWs per 1,000 adult women (0.1% up to 1%). This estimate is consistent with the prevalence of FSWs in Indonesia and Malaysia, two predominantly Muslim nations, at 0.4%⁶² and 0.9%,⁶³ respectively. It is also consistent with the global range of the percentage of women who engage in sex work, but it is on the low side of this range.⁶⁴

Clients of FSWs

Clients of sex workers come from all sectors of society and often include military personnel, police and other members of security forces,

⁴¹ Ati, "HIV/AIDS/STIs Social and Geographical Mapping."

⁴² Pakistan National AIDS Control Program, "Pilot Study in Karachi & Rawalpindi."

⁴³ Ibid.

⁴⁴ Farah and Hussein, "HIV Prevalence."

⁴⁵ Ibid.

⁴⁶ World Bank, "Mapping and Situation Assessment."

⁴⁷ Jenkins and Robalino, "HIV in the Middle East and North Africa."

⁴⁸ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II); Hawkes et al., "HIV and Other Sexually Transmitted Infections."

⁴⁹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

⁵⁰ Vandepitte et al., "Estimates of the Number of Female Sex Workers."

⁵¹ Ibid.

⁵² Ministry of Health and Medical Education of Iran, "Treatment and Medical Education"; Mostashari, UNODC, and Darabi, "Summary of the Iranian Situation on HIV Epidemic."

⁵³ Al-Serouri, "Assessment of Knowledge"; Lambert, "HIV and Development Challenges."

⁵⁴ Rodier et al., "Trends of Human Immunodeficiency Virus."

⁵⁵ World Bank, "Mapping and Situation Assessment."

⁵⁶ Ibid.

⁵⁷ Chaouki et al., "The Viral Origin of Cervical Cancer."

⁵⁸ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I); Blanchard, Khan, and Bokhari, "Variations in the Population Size."

⁵⁹ SNAP, UNICEF, and UNAIDS, "Baseline Study."

⁶⁰ Ahmed, *Antenatal*.

⁶¹ Ahmed, *Tea Sellers*.

⁶² Indonesia MOH, *National Estimates of Adult HIV Infection, Indonesia*.

⁶³ WHO, *Consensus Report*.

⁶⁴ Blanchard, Khan, and Bokhari, "Variations in the Population Size"; Vandepitte et al., "Estimates of the Number of Female Sex Workers"; Blanchard et al., "Variability in the Sexual Structure."

public officials, youth, truck drivers, sailors, migrant workers, traders, rich business people, single men with well-paying jobs, men with frequent travel, and Persian Gulf country tourists.⁶⁵ Several studies assessed the prevalence of sexual contacts with sex workers. Broadly speaking, levels of contacts appear comparable to those in other regions, but on the low side.⁶⁶ In Afghanistan, 39% of truck drivers reported having access to FSWs and 7% have had sex with FSWs in the last 12 months.⁶⁷ In Jordan, most voluntary counseling and testing (VCT) attendees reported contacts with sex workers as the reason for attending VCT services (Jordan National AIDS Program, personal communication). In Pakistan, 34% of truck drivers⁶⁸ and 34.7% of migrant workers⁶⁹ reported contacts with FSWs.⁷⁰

In Somalia, 48% of a group of healthy men reported contacts with FSWs.⁷¹ Also in Somalia, a group of predominantly soldiers attending sexually transmitted disease (STD) clinics reported contacts with sex workers at a frequency of 1.51 contacts per week.⁷² In Sudan, 3.1% of mainly rural populations in six states,⁷³ 7.6% of prisoners,⁷⁴ 71% of a group of truck drivers and prisoners,⁷⁵ and 57% of a group of soldiers, truck drivers, outpatients, and Ethiopian refugees reported contacts with FSWs.⁷⁶ Also in Sudan, 11.7% of military personnel,⁷⁷ 8.1% of truck drivers,⁷⁸ and 8.6% of prisoners⁷⁹ reported paying for sex. Among STD clinic attendees, 49.3% acquired their STD from sex workers.⁸⁰ Among mostly Sudanese refugees in Ethiopia, 46% of males reported having ever had sex with an FSW,

and 31% reported a sexual contact with an FSW within the last three months.⁸¹

The number of clients of sex workers is much bigger than that of the number of FSWs. In Pakistan, for example, the average number of clients per sex worker per month was 33.7.⁸² Therefore, the size of commercial sex networks is substantially bigger than that of IDUs and MSM risk networks, implying a substantially larger potential bridging population. The number of clients of sex workers in one study in Pakistan was found to be much larger than that of spouses of IDUs.⁸³

COMMERCIAL SEX AND RISK BEHAVIOR

This section reviews evidence on different aspects of sexual risk behavior among FSWs, including frequency of contacts with clients, nature of commercial sex networks, condom use, STI (sexually transmitted infection) transmission, anal and oral sex, and engagement of FSWs in injecting drug risk behavior.

Frequency of contacts with clients

The higher the frequency of sexual contacts with clients, the larger the potential for HIV to spread in commercial sex networks. Data suggest that FSWs in MENA have an average of about one client or less per *calendar* day, but a higher number per work day, broadly consistent with, but on the low side of, global trends.⁸⁴ In Afghanistan, FSWs reported an average of 13.1 clients per month in one study,⁸⁵ and in another study, 84% of them reported having one or two clients per working day, with 14% reporting three clients daily.⁸⁶ In the Islamic Republic of Iran, it is estimated that FSWs have five to nine customers per week,⁸⁷

⁶⁵ Busulwa, "HIV/AIDS Situation Analysis Study"; Action Aid Afghanistan, "HIV AIDS in Afghanistan"; Afi, "HIV/AIDS/STIs Social and Geographical Mapping"; ACORD, "Socio Economic Research."

⁶⁶ Carael et al., "Clients of Sex Workers."

⁶⁷ Action Aid Afghanistan, "HIV AIDS in Afghanistan."

⁶⁸ Agha, "Potential for HIV Transmission."

⁶⁹ Faisel and Cleland, "Study of the Sexual Behaviours."

⁷⁰ Agha, "Potential for HIV Transmission."

⁷¹ Ismail et al., "Sexually Transmitted Diseases in Men."

⁷² Burans et al., "HIV Infection Surveillance in Mogadishu, Somalia."

⁷³ SNAP, UNICEF, and UNAIDS, "Baseline Study."

⁷⁴ Assal, "HIV Prevalence."

⁷⁵ Burans et al., "Serosurvey of Prevalence."

⁷⁶ McCarthy et al., "Hepatitis B and HIV in Sudan."

⁷⁷ Ahmed, *Military*.

⁷⁸ Ahmed, *Truck Drivers*.

⁷⁹ Ahmed, *Prisoners*.

⁸⁰ Taha et al., "Study of STDs."

⁸¹ Holt et al., "Planning STI/HIV Prevention."

⁸² Blanchard, Khan, and Bokhari, "Variations in the Population Size."

⁸³ *Ibid.*

⁸⁴ Morison et al., "Commercial Sex"; Lau et al., "A Study on Female Sex Workers"; Strathdee et al., "Characteristics of Female Sex Workers"; Elmore-Meegan, Conroy, and Agala, "Sex Workers in Kenya"; Wilson et al., "Sex Worker."

⁸⁵ World Bank, "Mapping and Situation Assessment."

⁸⁶ Action Aid Afghanistan, "HIV AIDS in Afghanistan."

⁸⁷ Mostashari, UNODC, and Darabi, "Summary of the Iranian Situation on HIV Epidemic."

with another report indicating an average of nine customers per week.⁸⁸ In Lebanon, FSWs reported an average of 3.1 nonregular partners and 2.1 regular partners per week, with a monthly average of 11.7 sexual partners.⁸⁹ Almost all FSWs (97%) in another study had more than five clients within the last month.⁹⁰ Also in Lebanon, most FSWs reported three to seven clients each week.⁹¹

In Pakistan, 7%–48% of FSWs in different settings reported more than 20 clients last month, and more than 80% of the FSWs reported less than one paid client per day.⁹² The median number of clients per week in another study was three one-time clients and four regular clients.⁹³ In further studies from Pakistan, FSWs reported 4.5,⁹⁴ 4.6,⁹⁵ and 2.6⁹⁶ clients per workday and 31.6,⁹⁷ 36,⁹⁸ 33.1,⁹⁹ and 23¹⁰⁰ clients per month. Young FSWs were found to have the highest client volume.¹⁰¹ Another study from Pakistan reported a mean of 5.5 clients in the past week, with a mean of 1.7 new clients in the past week.¹⁰² This suggests that the number of new clients is relatively low, with many FSWs servicing a few regular clients.¹⁰³ The mean number of years in sex work was reported to be 13.9 years.¹⁰⁴

In Sudan, more than half of FSWs reported more than two clients per day in Khartoum State,¹⁰⁵ and an average of four clients per week

was reported in the Red Sea State.¹⁰⁶ The demand for sex work was found to rise during holidays, festivals, and at the end of the month.¹⁰⁷ In Southern Sudan, FSWs reported about two clients per day.¹⁰⁸ In the Syrian Arab Republic, 86.8% of FSWs reported one to three clients per day.¹⁰⁹ FSWs often report sexual activity with other sexual partners beyond sex work such as 53.8%¹¹⁰ and 43.2%¹¹¹ in two studies of FSWs in Pakistan, and 57%¹¹² in a study in Syria.

Alcohol consumption is associated with higher sexual risk behavior and HIV infection,¹¹³ and there is some evidence in MENA of alcohol and drug use in the context of commercial sex. In Pakistan, for example, in two studies, 27.4%¹¹⁴ and 28.2%¹¹⁵ of FSWs reported taking alcohol or drugs in the context of sex work in the last six months.

Structure of commercial sex networks

The data on the nature of commercial sex networks are limited. In parts of MENA, such as in Egypt, FSWs do not appear to form strong networks and do not have close ties.¹¹⁶ This pattern appears to hold true in Lebanon as well, where FSWs have limited interaction among themselves due to intense competition.¹¹⁷ In Southern Sudan, 92.8% of FSWs were working individually and not through mediators or organized sex work.¹¹⁸ Understanding the network structure of sex workers and their clients is important in understanding the transmission patterns of HIV

⁸⁸ Ministry of Health and Medical Education of Iran, "Treatment and Medical Education."

⁸⁹ Hermez et al., "HIV/AIDS Prevention among Vulnerable Groups."

⁹⁰ Mishwar, "An Integrated Bio-Behavioral Surveillance Study."

⁹¹ Rady, "Knowledge, Attitudes and Prevalence of Condom Use."

⁹² Pakistan National AIDS Control Program, "Pilot Study in Karachi & Rawalpindi."

⁹³ Bokhari et al., "HIV Risk in Karachi and Lahore, Pakistan."

⁹⁴ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

⁹⁵ Blanchard, Khan, and Bokhari, "Variations in the Population Size."

⁹⁶ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

⁹⁷ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

⁹⁸ Blanchard, Khan, and Bokhari, "Variations in the Population Size."

⁹⁹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹⁰⁰ Saleem, Adrien, and Razaque, "Risky Sexual Behavior."

¹⁰¹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹⁰² Hawkes et al., "HIV and Other Sexually Transmitted Infections."

¹⁰³ Ibid.

¹⁰⁴ Ibid.

¹⁰⁵ ACORD, "Qualitative Socio Economic Research."

¹⁰⁶ Ati, "HIV/AIDS/STIs Social and Geographical Mapping."

¹⁰⁷ Ibid.

¹⁰⁸ ACORD, "Socio Economic Research."

¹⁰⁹ Syria National AIDS Programme, "HIV/AIDS Female Sex Workers."

¹¹⁰ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹¹¹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹¹² Syria National AIDS Programme, "HIV/AIDS Female Sex Workers."

¹¹³ Mbulaiteye et al., "Alcohol and HIV"; Kaljee et al., "Alcohol Use"; Fisher, Bang, and Kapiga, "The Association between HIV Infection and Alcohol Use."

¹¹⁴ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹¹⁵ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹¹⁶ Family Health International, "Implementing AIDS Prevention and Care (IMPACT) Project."

¹¹⁷ Mishwar, "An Integrated Bio-Behavioral Surveillance Study."

¹¹⁸ ACORD, "Socio Economic Research."

and other STIs in commercial sex networks.¹¹⁹ Clustering of commercial sex networks into smaller subnetworks can reduce the overall STI prevalence among FSWs.¹²⁰ Given the limitations of the data, it is not possible to infer the connectivity of commercial sex networks in MENA.

Condom use

Reported condom use among FSWs varies substantially in MENA, although it appears to have been increasing in recent years. And while condom use is already at intermediate to high levels in several settings in MENA, it is still overall at low levels, particularly in the parts of MENA that are experiencing concentrated HIV epidemics among commercial sex workers, such as in Southern Sudan. This suggests that the majority of at-risk commercial sex acts in MENA are unprotected against HIV.

A number of studies documented condom use among FSWs in MENA. In Afghanistan, 36% of FSWs had ever used condoms.¹²¹ In Egypt, 6% of FSWs always used condoms,¹²² 56% had ever used condoms,¹²³ and 6.8% used condoms with noncommercial partners during last sex.¹²⁴ In the Islamic Republic of Iran, 24% and 83.2% of two FSW groups used condoms with the most recent client.¹²⁵ In studies in Lebanon, 28.1%, 34.8%, and 11.9% of FSWs reported that they always used condoms with nonregular clients, regular clients, and regular partners, respectively.¹²⁶ Almost 21% of these FSWs have never used condoms.¹²⁷ In a more recent study, 98%, 94%, and 43% of FSWs used condoms during last sex with a nonregular partner, a regular partner, and a regular client, respectively.¹²⁸

In Pakistan, 17%–18% of FSWs in different settings always used condoms and 19%–26% did not use condoms during the last month.¹²⁹ In another study, 29%–49% of FSWs used a condom with a one-time client during last sex, 26%–47% used a condom with a regular client during last sex, and 21% used a condom with a nonpaying male during last sex.¹³⁰ Condom use during anal or oral sex was found to be more limited than its use in vaginal sex; only 7.9% of FSWs used a condom during last anal sex and 32.4% during last oral sex.¹³¹ Also in Pakistan, 10% of migrant workers who had sex with FSWs used condoms.¹³²

In Sudan, 13% of FSWs used condoms regularly,¹³³ and as reported in different studies, 10.3%,¹³⁴ 24.6%,¹³⁵ 57.8%,¹³⁶ and 23%¹³⁷ had ever used condoms. In yet another study, only 2% of clients of FSWs used condoms during last sex.¹³⁸ According to studies in Syria, 13.2%, 20.6%, 51%, and 15.2% always used condoms, often used condoms, sometimes used condoms, and never used condoms, respectively.¹³⁹ In Tunisia, only 37% of FSWs always used condoms, and 65% had ever used condoms, even though these FSWs are legal sex workers with free access to primary care centers.¹⁴⁰ In the Republic of Yemen, 57.1% of FSWs used a condom during last paid sex, 28.8% used a condom during last nonpaid sex, 50% used condoms consistently with nonregular clients, and 58% used condoms consistently with regular clients.¹⁴¹ Further data on condom use among FSWs can be found in table 8.2.

Knowledge of condoms for HIV prevention, or as a birth control measure, appears to be rather high among FSWs, but still low in some

¹¹⁹ Ghani and Aral, "Patterns of Sex Worker-Client Contacts."

¹²⁰ Ibid.

¹²¹ World Bank, "Mapping and Situation Assessment."

¹²² El-Sayed et al., "Evaluation of Selected Reproductive Health Infections."

¹²³ Ibid.

¹²⁴ Egypt MOH and Population National AIDS Program, *HIV/AIDS Biological and Behavioral Surveillance Survey*.

¹²⁵ Jahani et al., "Distribution and Risk Factors."; Ardalan et al., "Sex for Survival."

¹²⁶ Hermez et al., "HIV/AIDS Prevention among Vulnerable Groups."

¹²⁷ Hermez, "HIV/AIDS Prevention through Outreach."

¹²⁸ Mishwar, "An Integrated Bio-Behavioral Surveillance Study."

¹²⁹ Pakistan National AIDS Control Program, "Pilot Study in Karachi & Rawalpindi."

¹³⁰ Bokhari et al., "HIV Risk in Karachi and Lahore, Pakistan."

¹³¹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance (Round II)*.

¹³² Faisel and Cleland, "Study of the Sexual Behaviours"; Faisel and Cleland, "Migrant Men."

¹³³ Ati, "HIV/AIDS/STIs Social and Geographical Mapping."

¹³⁴ Ahmed, *Sex Sellers*.

¹³⁵ ACORD, "Qualitative Socio Economic Research."

¹³⁶ Ati, "HIV/AIDS/STIs Social and Geographical Mapping."

¹³⁷ Anonymous, "Improving HIV/AIDS Response."

¹³⁸ SNAP, UNICEF, and UNAIDS, "Baseline Study."

¹³⁹ Syria National AIDS Programme, "HIV/AIDS Female Sex Workers."

¹⁴⁰ Hassen et al., "Cervical Human Papillomavirus Infection."

¹⁴¹ Štulhofer and Božicevic, "HIV Bio-Behavioural Survey."

MENA settings. Only 41%¹⁴² in Afghanistan and 17.2%,¹⁴³ 28%,¹⁴⁴ 45%,¹⁴⁵ and 45.1%¹⁴⁶ in studies in Sudan were aware of condoms. Condoms are often not seen as an HIV prevention measure, but as a contraceptive measure.¹⁴⁷ Between 37% and 77% of FSWs in Pakistan knew that condoms can prevent HIV.¹⁴⁸ The dominant mode of HIV prevention reported by FSWs in Sudan was minimizing the number of sexual partners.¹⁴⁹

Knowledge of condoms does not necessarily translate into actual use. A fraction of FSWs do not perceive condom use as necessary, such as 29.1% of FSWs in Syria.¹⁵⁰ Only a quarter of FSWs in Southern Sudan negotiate condom use with their clients.¹⁵¹ FSWs may not have the power to negotiate condom use,¹⁵² and fear insistence on condom use would upset customers and result in clients leaving them for other FSWs or offering a lower price.¹⁵³ Dire financial need undermines the ability of FSWs to negotiate condom use,¹⁵⁴ and partner refusal and low desirability are two other barriers to condom use. In Syria, 45.2% of FSWs reported partner refusal as the reason for not using condoms and 25.9% reported that they do not like using them.¹⁵⁵ Some FSWs are also willing not to use condoms in exchange for a higher price such as in Lebanon,¹⁵⁶ Sudan,¹⁵⁷ and the Republic of Yemen.¹⁵⁸

Access to condoms appears to be variable even within each MENA country. In the Republic of Yemen, FSWs in Aden reported easy access to condoms while other FSWs in other parts of the country reported difficulty in obtaining them.¹⁵⁹

In Egypt, 44% of FSWs reported difficulty in getting condoms and 89% reported difficulty in using them.¹⁶⁰ One-third to two-thirds of FSWs in different settings in Pakistan reported that condoms were readily available.¹⁶¹

Commercial sex and STI transmission

A number of studies have documented substantial levels of STIs among FSWs (chapter 10 on STIs). Furthermore, a number of studies have documented STI transmission during contacts with FSWs, confirming the presence of active commercial sex networks all over MENA and indicating the heightened risk of exposure to HIV and other STIs in these networks. In the Islamic Republic of Iran, 64% of gonorrhoea patients reported acquiring their infection through contacts with street-based FSWs.¹⁶² In Kuwait, 77% of STD clinic attendees reported acquiring their infection from FSWs.¹⁶³ A similar outcome was found in another study in Kuwait where the common source of STIs was contact with FSWs.¹⁶⁴ The contacts occurred both in (50%) and outside (48%) of Kuwait.¹⁶⁵

In Lebanon, a large fraction of the HIV infections acquired abroad were through contacts with FSWs.¹⁶⁶ In Pakistan, a history of urethritis or genital ulcer disease among male prisoners was associated with sex with FSWs.¹⁶⁷ The majority of Pakistanis who acquired HIV while working in the Persian Gulf region reported contacts with FSWs as the source of their infection.¹⁶⁸ Among truck drivers attending STD clinics in Pakistan, 40% reported contact with FSWs.¹⁶⁹ Also in Pakistan, 78% of STD clinic attendees who acquired STIs heterosexually reported that the source of infection was a sex

¹⁴² World Bank, "Mapping and Situation Assessment."

¹⁴³ ACORD, "Qualitative Socio Economic Research."

¹⁴⁴ Ati, "HIV/AIDS/STIs Social and Geographical Mapping."

¹⁴⁵ Ahmed, *Sex Sellers*.

¹⁴⁶ Anonymous, "Improving HIV/AIDS Response."

¹⁴⁷ ACORD, "Socio Economic Research"; Ahmed, *Sex Sellers*.

¹⁴⁸ Bokhari et al., "HIV Risk in Karachi and Lahore, Pakistan."

¹⁴⁹ ACORD, "Qualitative Socio Economic Research."

¹⁵⁰ Syria National AIDS Programme, "HIV/AIDS Female Sex Workers."

¹⁵¹ ACORD, "Socio Economic Research."

¹⁵² ACORD, "Socio Economic Research"; ACORD, "Qualitative Socio Economic Research."

¹⁵³ Ati, "HIV/AIDS/STIs Social and Geographical Mapping"; ACORD, "Qualitative Socio Economic Research."

¹⁵⁴ ACORD, "Socio Economic Research."

¹⁵⁵ Syria National AIDS Programme, "HIV/AIDS Female Sex Workers."

¹⁵⁶ Hermez et al., "HIV/AIDS Prevention among Vulnerable Groups."

¹⁵⁷ Ati, "HIV/AIDS/STIs Social and Geographical Mapping."

¹⁵⁸ Štulhofer and Božicevic, "HIV Bio-Behavioural Survey."

¹⁵⁹ Busulwa, "HIV/AIDS Situation Analysis Study."

¹⁶⁰ El-Sayed et al., "Evaluation of Selected Reproductive Health Infections."

¹⁶¹ Pakistan National AIDS Control Program, "Pilot Study in Karachi & Rawalpindi."

¹⁶² Zargooshi, "Characteristics of Gonorrhoea."

¹⁶³ Al-Mutairi et al., "Clinical Patterns."

¹⁶⁴ Al-Fouzan and Al-Mutairi, "Overview."

¹⁶⁵ Al-Owaish et al., "HIV/AIDS Prevalence."

¹⁶⁶ Pieniasek et al., "Introduction of HIV-2."

¹⁶⁷ Akhtar and Luby, "Risk Behaviours."

¹⁶⁸ Shah et al., "HIV-Infected Workers Deported"; Baqi, Kayani, and Khan, "Epidemiology and Clinical Profile of HIV/AIDS"; Khan et al., "HIV-1 Subtype A Infection."

¹⁶⁹ Khawaja et al., "HIV/AIDS and Its Risk Factors in Pakistan."

worker.¹⁷⁰ In Saudi Arabia, 90% of men who were infected with HIV heterosexually acquired it from FSWs.¹⁷¹ In Somalia, two studies reported that 40%¹⁷² and 54%¹⁷³ of STD clinic attendees reported contacts with FSWs. In Sudan, 49.3% of STD patients reported acquiring their infection from FSWs.¹⁷⁴ HIV prevalence in Southern Sudan was 14% among men who reported contacts with FSWs, but 0% among men who denied such contacts.¹⁷⁵

Anal sex, oral sex, and STIs as cofactors

Several studies have documented anal and oral sex practices in MENA. In Pakistan, FSWs in different cities reported having anal sex with a range of 0.6–4.1 clients last month.¹⁷⁶ In Sudan, about 55% of FSWs reported engaging in anal sex and 40% did so regularly.¹⁷⁷ Most often this was demanded or imposed by clients, but on occasion FSWs opted for anal sex to avoid pregnancy or to avoid having vaginal sex during menstruation.¹⁷⁸ The HIV transmission probability per coital act in unprotected receptive anal intercourse (0.0082)¹⁷⁹ is much higher than that of vaginal intercourse (0.0015).¹⁸⁰

Oral sex appears to be common and was reported by 40% of FSWs in a study in Sudan.¹⁸¹ In Pakistan, FSWs in different cities reported oral sex with a range of 0.6–3.8 clients last month.¹⁸²

Only 3% of FSWs in a study in Sudan reported refraining from sex while suffering from a reproductive tract infection, a practice of concern considering the biological association of HIV transmission and STI coinfections.¹⁸³

Engagement of FSWs in injecting drug risk behavior

FSWs report considerable levels of drug use both in injecting and noninjecting forms, and also report having sex with IDUs. These facts highlight the ease by which HIV can move between IDUs and FSWs. In particular, FSWs who inject drugs, or female IDUs who exchange sex for money or drugs, form subgroups at a heightened risk of HIV exposure, as has been seen in Asia.¹⁸⁴ These FSWs are highly marginalized and in urgent need of prevention and care programs.

Several studies have documented drug use among FSWs and sexual contacts with IDUs, but the data on female IDUs exchanging sex for money are limited. In Egypt, 9.3% of FSWs injected drugs and 78.8% used drugs.¹⁸⁵ In the Islamic Republic of Iran, 2% of a group of mainly FSWs injected drugs and 15.3% reported noninjecting drug use.¹⁸⁶ In another study, 2.5% of FSWs injected drugs and 60% used drugs.¹⁸⁷ In Pakistan, 20% of FSWs reported that they had clients whom they knew to inject drugs and 1%–2% of FSWs reported injecting drugs.¹⁸⁸ Also, in two studies in Pakistan, 3.3%¹⁸⁹ and 2.3%¹⁹⁰ of FSWs reported injecting drugs in the last six months and 13.5%¹⁹¹ and 9.9%¹⁹² had sex with IDUs. In yet more studies from Pakistan, 3% of FSWs reported injecting drugs in the last year,¹⁹³ 36% reported having sex with an IDU in the last year,¹⁹⁴ 20.3% reported IDUs as clients,¹⁹⁵ 22.4% reported lovers who inject drugs,¹⁹⁶ and 26% reported having a husband who injects drugs.¹⁹⁷

¹⁷⁰ Rehan, "Profile of Men."

¹⁷¹ Alrajhi, Halim, and Al-Abdely, "Mode of Transmission of HIV-1."

¹⁷² Burans et al., "HIV Infection Surveillance in Mogadishu, Somalia."

¹⁷³ Ismail et al., "Sexually Transmitted Diseases in Men."

¹⁷⁴ Omer et al., "Sexually Transmitted Diseases in Sudanese Males."

¹⁷⁵ McCarthy, Khalid, and El Tigani, "HIV-1 Infection in Juba, Southern Sudan."

¹⁷⁶ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹⁷⁷ Ati, "HIV/AIDS/STIs Social and Geographical Mapping."

¹⁷⁸ Ibid.

¹⁷⁹ Vittinghoff et al., "Per-Contact Risk."

¹⁸⁰ Wawer et al., "Rates of HIV-1 Transmission."

¹⁸¹ Ati, "HIV/AIDS/STIs Social and Geographical Mapping."

¹⁸² Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹⁸³ Korenromp et al., "Estimating the Magnitude."

¹⁸⁴ Commission on AIDS in Asia, *Redefining AIDS in Asia*.

¹⁸⁵ Egypt MOH and Population National AIDS Program, *HIV/AIDS Biological and Behavioral Surveillance Survey*.

¹⁸⁶ Jahani et al., "Distribution and Risk Factors."

¹⁸⁷ Tehrani and Malek-Afzalip, "Knowledge, Attitudes and Practices."

¹⁸⁸ Bokhari et al., "HIV Risk in Karachi and Lahore, Pakistan."

¹⁸⁹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹⁹⁰ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹⁹¹ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹⁹² Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹⁹³ Mayhew et al., "Protecting the Unprotected"; Hawkes et al., "HIV and Other Sexually Transmitted Infections."

¹⁹⁴ Hawkes et al., "HIV and Other Sexually Transmitted Infections."

¹⁹⁵ Mayhew et al., "Protecting the Unprotected."

¹⁹⁶ Ibid.

¹⁹⁷ Hawkes et al., "HIV and Other Sexually Transmitted Infections."

In Sudan, 4.8% of FSWs used drugs and 14.5% reported substance abuse among their clients.¹⁹⁸ In Syria and the Republic of Yemen, 10%¹⁹⁹ and 2%²⁰⁰ of FSWs injected drugs, respectively.

KNOWLEDGE OF HIV/AIDS

Levels of HIV knowledge among sex workers appear to vary substantially in MENA. In Afghanistan, only 4% of FSWs in one study had heard of HIV/AIDS,²⁰¹ but in another study most FSWs reported knowing of HIV/AIDS, though very few ever tested for it.²⁰² In Egypt, all FSWs were aware of HIV and some of its transmission modes, but still had misconceptions about its transmission.²⁰³ In the Islamic Republic of Iran, FSWs were found to be significantly less knowledgeable about HIV/AIDS than both youth and truck drivers.²⁰⁴

In Lebanon, almost all FSWs were aware of HIV/AIDS, its transmission modes, the condom's role in prevention, and other prevention measures.²⁰⁵ However, 21.5% of these FSWs perceived no chance of becoming infected with HIV, possibly because of condom use.²⁰⁶ In two studies in Pakistan, 60%²⁰⁷, and 68%–98%²⁰⁸ of FSWs reported ever hearing of HIV/AIDS, but only 15%–39% of FSWs felt at risk of HIV infection.²⁰⁹ In Somalia, both men and women not engaged in sex work were found to know more than FSWs about HIV/AIDS.²¹⁰ In Sudan, 75.5% of FSWs were aware of HIV and its symptoms, and 54.9% were aware of some of its transmission modes.²¹¹ In the Republic of Yemen, 85.9% of FSWs perceived no high risk of HIV infection.²¹²

FSWs seek treatment for STIs through self-treatment or through friends rather than through knowledgeable health personnel.²¹³ They continue to suffer from unavailability of medical and support services,²¹⁴ and continue to fear pursuing such services due to social stigmatization, marginalization, and law enforcement.²¹⁵ All of the above factors contribute to the precarious and vulnerable position that FSWs endure in MENA.

ANALYTICAL SUMMARY

Commercial sex is prevalent all over MENA, although at lower levels compared to other regions. Economic pressure, family disruption or dysfunction, and political conflicts are major pressures for commercial sex in MENA. Roughly 0.1% to 1% of women appear to exchange sex for money or other commodities, and a few percentage points of men report sexual contacts with FSWs. Accordingly, commercial sex networks are the largest of the three key priority group networks in MENA.

There is considerable evidence on HIV prevalence and risk behavior practices among FSWs in MENA. Earlier evidence suffered from methodological limitations, but the quality of evidence has improved significantly in recent years. Regardless, all evidence suggests that HIV prevalence continues to be at low levels among FSWs in most countries, though at levels much higher than those in the general population. HIV does not appear to be well established in many commercial sex networks in MENA. In three countries, however (Djibouti, Somalia, and Sudan), HIV prevalence has reached high levels, indicating concentrated HIV epidemics in at least parts of these countries. Nevertheless, HIV prevalence in these countries is at lower levels than those found in hyperendemic HIV epidemics in sub-Saharan Africa.

FSWs report considerable levels of sexual risk behavior including roughly one client per calendar day; low levels of condom use, particularly in areas of concentrated HIV epidemics among

¹⁹⁸ Ati, "HIV/AIDS/STIs Social and Geographical Mapping."

¹⁹⁹ UNAIDS, "Notes on AIDS in the Middle East and North Africa"; Syria National AIDS Programme, "HIV/AIDS Female Sex Workers."

²⁰⁰ Štulhofer and Božicevic, "HIV Bio-Behavioural Survey."

²⁰¹ Action Aid Afghanistan, "HIV AIDS in Afghanistan."

²⁰² World Bank, "Mapping and Situation Assessment."

²⁰³ Egypt MOH and Population National AIDS Program, *HIV/AIDS Biological and Behavioral Surveillance Survey*.

²⁰⁴ Tehrani and Malek-Afzalip, "Knowledge, Attitudes and Practices."

²⁰⁵ Hermez et al., "HIV/AIDS Prevention among Vulnerable Groups."

²⁰⁶ *Ibid.*

²⁰⁷ Ali and Khanani, *Interventions Aimed at Behavior Modification*.

²⁰⁸ Bokhari et al., "HIV Risk in Karachi and Lahore, Pakistan."

²⁰⁹ *Ibid.*

²¹⁰ Corwin et al., "HIV-1 in Somalia."

²¹¹ Anonymous, "Improving HIV/AIDS Response."

²¹² Štulhofer and Božicevic, "HIV Bio-Behavioural Survey."

²¹³ Tehrani and Malek-Afzalip, "Knowledge, Attitudes and Practices."

²¹⁴ Mohebbi, "Female Sex Workers and Fear of Stigmatisation."

²¹⁵ Zargooshi, "Characteristics of Gonorrhoea."

FSWs; anal and oral sex in addition to vaginal sex; having clients or sexual partners who inject drugs; and injecting drugs themselves. Considerable levels of STI prevalence other than HIV are found among FSWs. STD clinic attendees repeatedly report acquiring STDs through paid sex. Levels of comprehensive HIV knowledge among FSWs vary across the region, with both high and low levels being documented in different settings.

The above factors suggest a potential for further HIV spread among FSWs, but probably not at high levels in most countries, except for Djibouti, Somalia, and Sudan. Near universal male circumcision, with its efficacy against HIV acquisition (chapter 6), and the lower risk behavior compared to other regions may prevent massive or even concentrated HIV epidemics among FSWs from materializing in most countries in MENA for at least a decade, if ever. Furthermore, the dynamics of HIV infection among FSWs are different from those for MSM and IDUs. FSWs are infected by their clients who are at lower risk behavior than themselves, as opposed to MSM and IDUs who are infected by members of their own risk group.

Yet HIV prevalence among FSWs will be at levels much higher than those among the general population. Subgroups within FSWs may be particularly at high risk of HIV, such as those who inject drugs, those who have clients who inject drugs, and female IDUs who exchange sex for money or drugs, as well as FSWs with low socioeconomic status who have poor HIV knowledge or are not able to afford or negotiate condom use. These subgroups are highly marginalized and in dire need of prevention and care programs. Furthermore, all FSWs are in need of prevention and care services not only because of HIV, but also because of the considerable levels of other STIs in this population. Dedicated STI services for FSWs need to be established, and in settings where they are already established, they need to be expanded.

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Potential Bridging Populations and HIV

This chapter focuses on the biological evidence for the extent of human immunodeficiency virus (HIV) spread among potential bridging populations, the behavioral evidence for sexual and injecting risk practices among these population groups, and the context of bridging the infection to the general population in the Middle East and North Africa (MENA).

CONTEXT OF BRIDGING POPULATIONS IN MENA

Bridging populations are defined as the populations that bridge HIV infections from the high-risk priority groups to the low-risk general population. These conventionally include groups such as clients of female sex workers (FSWs), truck drivers, taxi drivers, military personnel, fishermen, sailors, migrant labor, and the sexual partners of injecting drug users (IDUs), FSWs, and men who have sex with men (MSM). A sizable segment of the MENA population belongs to these groups. Djibouti has a major trade corridor with Ethiopia and large military installations of foreign troops that facilitated a strong demand for an active and complex sex trade that caters to truck drivers, foreign military personnel, and the local population.¹ It is estimated that there are 2,000 international truck drivers

and 60,000 domestic drivers in Afghanistan,² and 1 million truck drivers in Pakistan.³ Migrant males constitute 15%–20% of all adult men in Pakistan.⁴

Given the limited HIV prevalence found in MENA, one must be cautious in labeling any population group in the region as a bridging population. The evidence on the role of conventionally defined bridging populations in the HIV epidemics in MENA needs to be well established. Based on current evidence as discussed below, one cannot conclude that there is a clear contribution of such populations in the HIV epidemic. Therefore bridging populations have been labeled here as *potential bridging populations* to highlight the specific nature of their context in MENA.

HIV PREVALENCE IN POTENTIAL BRIDGING POPULATIONS

HIV point-prevalence surveys of potential bridging populations are still limited in MENA. Table 5.1 lists available data. The low HIV prevalence found in these surveys, along with the context of HIV spread in the rest of risk groups, suggests that HIV spread may be still limited in

¹ El-Saharty and Ali, "An Effective Well-Coordinated Response to HIV in Djibouti."

² Ryan, "Travel Report Summary."

³ Agha, "Potential for HIV Transmission."

⁴ Faisal and Cleland, "Study of the Sexual Behaviours"; Faisal and Cleland, "Migrant Men."

Table 5.1 HIV Prevalence in Potential Bridging Populations in MENA

Country	HIV prevalence in potential bridging populations
Jordan	0.0% (military personnel; Jordan National AIDS Program, personal communication)
Iran, Islamic Republic of	0.0% (truck drivers; S. Seyed Alinaghi, personal communication [2009])
Morocco	1.0% (truck drivers; Bennani and Alami 2006) 0.0% (truck drivers; Morocco MOH 2007) 0.0% (sailors; Khattabi and Alami 2005) 0.28% (sailors; Bennani and Alami 2006) 0.62% (sailors; Morocco MOH 2007)
Pakistan	0.0% (truck drivers; Ahmed et al. 1995) 0.0% (truck drivers; Bokhari et al. 2007) 1.0% (truck drivers; Bokhari et al. 2007) 0.6% (seafarers; Mujeeb and Hafeez 1993)
Sudan	0.0% (truck drivers; Burans et al. 1990) 0.5% (truck drivers; Farah and Hussein 2006) 1.1% (truck drivers; Ahmed 2004b) 1.7% (military personnel; McCarthy et al. 1989) 0.5% (military personnel; Ahmed 2004a) 2.9% (military personnel; Yei town, Southern Sudan; SNAP, NSNAC, and UNAIDS 2006) 0.8% (military personnel; Rumbek town, Southern Sudan; SNAP, NSNAC, and UNAIDS 2006) 14% (clients of FSWs; Southern Sudan; McCarthy, Khalid, and El Tigani 1995)
Other	1.54% (truck drivers ^a ; Botros et al. 2007)

^aA complex network of truck drivers serving Europe, the Russian Federation, Caucasus, Central Asia, China, and the Middle East.

bridging populations in MENA, apart from Djibouti, Somalia, and Sudan.

POTENTIAL BRIDGING POPULATIONS AND RISK BEHAVIOR

Several studies have documented risk behaviors among potential bridging populations in MENA. In Afghanistan, 39% of truck drivers reported access to FSWs and 7% paid for sex in the last 12 months.⁵ In Djibouti, 22.7% of dockers had two or three wives and of those who had one wife, 53.2% of their wives were living away in Ethiopia.⁶ Among truck drivers, 14% were in polygamous unions, 24.8% had more than one sex partner, 18.4% had a nonregular sex partner, and 17.5% had contacted FSWs in the previous year.⁷ In the Islamic Republic of Iran, 38.3% of truck drivers reported premarital or extramarital sex and 35.2% had never used condoms.⁸

In Pakistan, 40% of truck drivers attending a sexually transmitted disease (STD) clinic reported contact with FSWs and 53% reported male same-sex contacts.⁹ Most truck drivers in one study were married, but they were away from their wives for up to two months at a time.¹⁰ Among them, 34% had sex with an FSW, 11.3% had sex with a male sex worker (MSW), and 49.3% had sex with a man. Most truckers had limited knowledge of HIV and were not aware that condoms can protect against HIV. Only 3%–6% of them used condoms during last sex with a nonspousal partner. In another study, 32.3% of truck drivers paid for sex with a female, 1.7% used a condom during last sex with an FSW, 21.9% had sex with a male or *hijra*, and 0% used condoms during last sex with a male or *hijra*.¹¹ Truck drivers in Pakistan are reported to have male helpers or “cleaners” who accompany them during their travel and who may be expected to have sex with the driver.¹² Syphilis

⁵ Action Aid Afghanistan, “HIV/AIDS in Afghanistan.”

⁶ O’ Grady, *WFP Consultant Visit to Djibouti Report*.

⁷ *Ibid.*

⁸ Tehrani and Malek-Afzalip, “Knowledge, Attitudes and Practices.”

⁹ Khawaja et al., “HIV/AIDS and Its Risk Factors in Pakistan.”

¹⁰ Agha, “Potential for HIV Transmission.”

¹¹ Bokhari et al., “HIV Risk in Karachi and Lahore, Pakistan.”

¹² Khawaja et al., “HIV/AIDS and Its Risk Factors in Pakistan.”

prevalence has been reported as 9.4% among truck drivers, indicating considerable prevalence of risk behaviors.¹³

Among urban migrant males in Pakistan, 63.5% had sex with one or more nonmarital partners, 34.7% had sex with an FSW, and 1.7% had sex with a man.¹⁴ About half of the nonmarital partners over the last year were FSWs and the other half were identified as female “friends.” Three-quarters of those who reported having sex with a female friend also reported having sex with an FSW. Most of the high-risk behaviors were concentrated, but not confined to, between puberty and marriage.

In Somalia, 30.3% of traveling merchants and drivers had more than one sexual partner in the previous year,¹⁵ and the majority of truck drivers reported contacts with FSWs.¹⁶ In Sudan, 2.4% of truck drivers had ever used condoms, 29.6% had premarital or extramarital sex, 12.9% had premarital sex, and 8.1% had paid for sex.¹⁷ In another study, 55% of truck drivers reported no current sexual partners, 13.4% reported one partner, 7.4% reported two partners, 10.8% reported three partners, and 13.4% reported more than three partners.¹⁸ Among them, 3.4% had sex before marriage, 0.2% had sex with males and females, 0.5% had sex only with males, and 72.1% had heard of condoms but only 8.9% ever used them.¹⁹ Among military personnel, 2.7% had ever used condoms, 42.5% had premarital or extramarital sex, 5.2% had premarital sex, and 11.7% had paid for sex.²⁰ In another study, 39.6% of sexually active military personnel had one sexual partner, 13.4% had two partners, 12.5% had three partners, and 31.2% had more than three partners.²¹

A study among truck drivers serving a complex network from Europe, the Russian Federation, Caucasus, Central Asia, China, and the Middle East found that 1.9% of the drivers

were IDUs.²² The study also reported prevalence of sexual contacts with FSWs and other males and that these contacts were associated with HIV prevalence.

Existing evidence suggests considerable levels of sexual risk behavior among potential bridging populations including sexual contacts with FSWs and other nonmarital females as well as other males. There is hardly any evidence on injecting drug practices among these population groups.

VULNERABILITY OF SEXUAL PARTNERS OF PRIORITY POPULATIONS

A key highlight of HIV epidemiology in MENA is the vulnerability of sexual partners of both priority populations and FSW clients to HIV infection, and their limited role in transmitting HIV to the general population. Women are especially vulnerable because most risk behaviors in MENA are practiced by men. The majority of women living with HIV in MENA were infected through their husbands or partners, who were mostly not aware of their infections.²³ Ninety-seven percent of women living with HIV in Saudi Arabia were infected by their husbands.²⁴ Seventy-six percent of women living with HIV in the Islamic Republic of Iran were also infected by their husbands, who were predominantly IDUs.²⁵ HIV infections are repeatedly found among pregnant women with no identifiable risk behaviors, suggesting that the risk factor is heterosexual sex with the spouse.²⁶ The average age at HIV infection among women in the West Bank and Gaza is close to a decade younger than that of men, and most women were infected by their husbands.²⁷

Given the low levels of risk behavior in the general population (chapters 6 and 10), sexual partners of priority populations appear to rarely engage in risky behavior (beyond sexual contacts with their partners who engage in risk

¹³ WHO/EMRO, “Prevention and Control.”

¹⁴ Faisel and Cleland, “Study of the Sexual Behaviours”; Faisel and Cleland, “Migrant Men.”

¹⁵ WHO/EMRO, “Presentation of WHO Somalia’s Experience.”

¹⁶ Burans et al., “HIV Infection Surveillance in Mogadishu, Somalia.”

¹⁷ Ahmed, *Truck Drivers*.

¹⁸ Farah and Hussein, “HIV Prevalence.”

¹⁹ Ibid.

²⁰ Ahmed, *Military*.

²¹ Sudan National HIV/AIDS Control Program, *HIV/AIDS/STIs Prevalence*.

²² Botros et al., “HIV Prevalence and Risk Behaviours.”

²³ McGirk, “Religious Leaders Key.”

²⁴ Alrajhi, Halim, and Al-Abdely, “Mode of Transmission of HIV-1.”

²⁵ Ramezani, Mohraz, and Gachkar, “Epidemiologic Situation”; Burrows, Wodak, and WHO, *Harm Reduction in Iran*.

²⁶ Aidaoui, Bouzbid, and Laouar, “Seroprevalence of HIV Infection.”

²⁷ UNAIDS, “Key Findings.”

behaviors), and probably rarely spread the infection further. In this sense, they are not a bridging population that would pass the infection into the general population. This aspect of HIV epidemiology in MENA could be one of the factors behind the consistently very low HIV prevalence found in the general population (chapter 6).

ANALYTICAL SUMMARY

A sizable fraction of the MENA population belongs to what can be labeled as *potential bridging populations*. Evidence on HIV prevalence, other STIs' prevalence, sexual risk behavior measures, and drug injecting practices among potential bridging populations remains rather limited. Existing evidence suggests considerable levels of sexual risk behavior among potential bridging populations, but limited HIV prevalence, except possibly for Djibouti, Somalia, and Sudan.

The limited HIV prevalence among potential bridging populations is probably a consequence of the low HIV prevalence among FSWs and the high coverage of male circumcision among men. In this sense, these populations are not key contributors to the dynamics of HIV infectious spread in MENA and are not effectively bridging populations capable of spreading the infection further to the general population.

Indeed, a key characteristic of sexual partners of priority populations in this region is their vulnerability to HIV, rather than their role in HIV spread. Sexual partners of priority groups are enduring a sizable proportion of the HIV disease burden, though they rarely transmit the infection further, except to their own children. Women are especially vulnerable because most risk behaviors are practiced by men. HIV prevention efforts in MENA should address this key vulnerability.

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General Population and HIV

This chapter focuses on the biological evidence for the extent of human immunodeficiency virus (HIV) spread among the general population, the behavioral evidence for sexual risk practices among this population group, and the context of the general population in the Middle East and North Africa (MENA).

HIV PREVALENCE IN THE GENERAL POPULATION

HIV prevalence has been measured in a number of general population groups in MENA. Prevalence levels are very low in all countries

with the exception Djibouti, Somalia, and Sudan. Tables 6.1–6.3 and C.1 (appendix c) list the results of available point-prevalence surveys in population-based and national surveys; among antenatal clinic (ANC) attendees and other pregnant women; blood donors; and other different subpopulation groups in MENA.

The data below indicate that there is no evidence of a substantial HIV epidemic in the general population in any of the MENA countries. There appears to be very limited HIV transmission within the general population in MENA, apart from Djibouti, Somalia, and Sudan. In these nations, HIV is already generalized in parts

Table 6.1 HIV Prevalence in Population-Based Surveys in MENA

Country	HIV prevalence
Djibouti	2.9% (national; Djibouti, Ministère de La Santé, and Association Internationale de Développement 2002) 3.4% (in Djibouti-ville; UNAIDS 2008) 1.1% (out of Djibouti-ville; UNAIDS 2008) 2.0% (Maslin et al. 2005) 2.2% (Maslin et al. 2005)
Iran, Islamic Republic of	0.0% (Hamadan province; Amini et al. 1993) 0.01% (Massarrat and Tahaghoghi-Mehrizi 2002)
Libya	0.13% (Libya National Center for the Prevention of and Control of Infectious Diseases 2005) 0.67% (Alkoufra; El-Gadi, Abudher, and Sammud 2008) 0.4% (Tripoli; El-Gadi, Abudher, and Sammud 2008)
Sudan	2.6% (national; SNAP 2005a) 2.0% (national; UNAIDS and WHO 2003) 1.6% (national; Sudan MOH 2006) 1.4% (national; SNAP 2008) 0.4% (Rumbek town, Southern Sudan; Kaiser et al. 2006) 4.4% (Yei town, Southern Sudan; Kaiser et al. 2006) 2.7% (in overall in Yei area; Southern Sudan; SNAP, NSNAC, and UNAIDS 2006)

Table 6.2 HIV Prevalence among ANC Attendees and Other Pregnant Women in MENA

Country	HIV prevalence
Afghanistan	0.0% (Todd et al. 2007; Todd et al. 2008)
Algeria	1.0% (Institut de Formation Paramédicale de Parnet 2004) 0.53% (Aidaoui, Bouzbid, and Laouar 2008) 0.7% (Algeria MOH [unknown]) 0.9% (Algeria MOH [unknown]) 0.2% (Alami 2009) 0.14% (Alami 2009) 0.09 (Alami 2009) 0.5% (Alami 2009) 0.23% (Alami 2009)
Djibouti	2.5% (Unknown 2002)
Iran, Islamic Republic of	0.02% (Ministry of Health and Medical Education of Iran 2006) ≈0.1% (WHO/EMRO 2007a) 0.5% (SeyedAlinaghi 2009) 0.05% (Sharifi-Mood and Keikha 2008)
Mauritania	0.4% (WHO 2002)
Morocco	0.03% (Khattabi and Alami 2005) 0.0025% (Khattabi and Alami 2005) 0.014% (Khattabi and Alami 2005) 0.0% (WHO/EMRO Regional Database on HIV/AIDS) 0.12% (Khattabi and Alami 2005; Morocco MOH 2006) 0.13% (UNAIDS/WHO 2005; Morocco MOH 2006) 0.04% (Elharti et al. 2002) 0.02% (Elharti et al. 2002) 0.01% (Elharti et al. 2002) 0.07% (Elharti et al. 2002) 0.15% (Khattabi and Alami 2005) 0.10% (Khattabi and Alami 2005) 0.08% (Alami 2009) 0.06% (Bennani and Alami 2006)
Somalia	0.0% (Jama et al. 1987) 0.9% (WHO 2004c) 0.9% (Somaliland; WHO 2004c) 1.4% (Somaliland; WHO 2004c) 1.3% (Somaliland; WHO 2004c; Somaliland Ministry of Health and Labour 2007) 0.7% (Somaliland Ministry of Health and Labour 2007) 1.6% (Somaliland Ministry of Health and Labour 2007) 0.0% (Somaliland Ministry of Health and Labour 2007) 2.3% (Somaliland Ministry of Health and Labour 2007) 0.6% (Somaliland Ministry of Health and Labour 2007) 1.1% (Somaliland Ministry of Health and Labour 2007) 1.6% (Somaliland Ministry of Health and Labour 2007) 2.7% (Somaliland Ministry of Health and Labour 2007) 0.0% (Somaliland Ministry of Health and Labour 2007) 1.3% (Somaliland Ministry of Health and Labour 2007) 2.2% (Somaliland Ministry of Health and Labour 2007) 0.8% (Somaliland Ministry of Health and Labour 2007) 1.0% (Puntland; WHO 2004b) 0.6% (central Somalia; WHO 2004c) 0.7% (refugees; UNHCR 2003) 1.4% (refugees; UNHCR 2005) 1.0% (refugees; UNHCR 2006–07a) 1.5% (refugees; UNHCR 2006–07a) 1.6% (refugees; UNHCR 2006–07a) 1.2% (refugees; UNHCR 2006–07a)

Table 6.2 (Continued)

Country	HIV prevalence
	0.6% (refugees; UNHCR 2006–07a)
	0.7% (refugees; UNHCR 2006–07a)
	1.9% (refugees; UNHCR 2006–07a)
	0.1% (refugees; PMTCT attendees; UNHCR 2006–07a)
Sudan	1.0% (national; Sudan National AIDS/STIs Program 2008; Sudan National HIV/AIDS Control Program 2005b)
	1.0% (Ahmed 2004b)
	0.58% (national; Sudan National AIDS/STIs Program 2008)
	0.5% (Gutbi and Eldin 2006)
	1.57% (IDPs; SNAP and UNAIDS 2006)
	0.26% (refugees; Sudan National AIDS/STIs Program 2008)
	0.27% (IDPs; Sudan National AIDS/STIs Program 2008)
	6–8% (Southern Sudan; UNAIDS and WHO 2003)
	3.4% (Southern Sudan; Southern Sudan AIDS Commission 2007)
	2.3% (Southern Sudan; NSNAC and UNAIDS 2006)
	0–11.1% (various locations; Southern Sudan; Southern Sudan AIDS Commission 2007)
	3.0% (Juba, Southern Sudan; Basha 2006)
	4.0% (Juba, Southern Sudan; Basha 2006)
	2.3% (Yei town; Southern Sudan; SNAP, NSNAC, and UNAIDS 2006; Kaiser et al. 2006)
	2.3% (Rumbek town; Southern Sudan; SNAP, NSNAC, and UNAIDS 2006; Kaiser et al. 2006)
	1.6% (Tambura; Southern Sudan; NSNAC and UNAIDS 2006)
	2.0% (Ezo; Southern Sudan; NSNAC and UNAIDS 2006)
	7.2% (Yambio; Southern Sudan; NSNAC and UNAIDS 2006)
	8.7% (Yambio; villages near main road; Southern Sudan; NSNAC and UNAIDS 2006)
	3.0% (Yambio; villages away from main road; Southern Sudan; NSNAC and UNAIDS 2006)
	0.19% (North Sudan; Sudan National AIDS/STIs Program 2008)
	0.66% (PMTCT attendees; North Sudan; SNAP 2008; NSNAC and UNAIDS 2006)
	0.14% (urban; North Sudan; Sudan National AIDS/STIs Program 2008)
	0.33% (rural; North Sudan; Sudan National AIDS/STIs Program 2008)
	2.0% (West Nile; North Sudan; Sudan MOH 2006)
	1.5% (Red Sea; North Sudan; Sudan National HIV/AIDS Control Program 2005b)
	0.0% (Alghadarif; North Sudan; Sudan National HIV/AIDS Control Program 2005b)
	0.0% (Kassala; North Sudan; Sudan National HIV/AIDS Control Program 2005b)
	0.0% (Upper Nile; North Sudan; Sudan National HIV/AIDS Control Program 2005b)
	0.98% (Algazira; North Sudan; Sudan National HIV/AIDS Control Program 2005b)
	0.0% (Algazira; North Sudan; SNAP and UNAIDS 2006)
	0.0% (Blue Nile; North Sudan; SNAP and UNAIDS 2006)
	0.0% (West Kurdufan; North Sudan; SNAP and UNAIDS 2006)
	0.0% (North Darfur; North Sudan; SNAP and UNAIDS 2006)
	2.2% (White Nile; North Sudan; Sudan National HIV/AIDS Control Program 2005b; SNAP and UNAIDS 2006)
	0.0% (Upper Nile; North Sudan; SNAP and UNAIDS 2006)
	1–5% (Khartoum; North Sudan; UNAIDS 2000)
	0.25% (Khartoum; North Sudan; Gutbi and Eldin 2006)
	0.5% (Khartoum 1; North Sudan; Sudan National HIV/AIDS Control Program 2005b; Gutbi and Eldin 2006)
	0.25% (Khartoum 2; North Sudan; Sudan National HIV/AIDS Control Program 2005b; Gutbi and Eldin 2006)
	0.25% (Khartoum 3; North Sudan; Sudan National HIV/AIDS Control Program 2005b; Gutbi and Eldin 2006)
	0.8% (Khartoum; North Sudan; Ahmed 2004b)
	1.38% (Khartoum; North Sudan; Gasmelseed et al. 2006)
	5.0% (refugees; IRC 2002)
	1.2% (refugees; UNHCR 2006–07b)
	0.8% (PMTCT attendees; UNHCR 2006–07b)

Note: IDP = internally displaced person; PMTCT = prevention of mother-to-child transmission.

Table 6.3 HIV Prevalence among Blood Donors in MENA

Country	HIV prevalence
Afghanistan	0.0% (Dupire et al. 1999) 0.0006% (Afghanistan Central Blood Bank 2006)
Algeria	0.01% (Unknown 2002) 0.02% (Unknown 2002) 0.08% (Unknown 2002) 0.01% (Unknown 2002)
Djibouti	0.0% (Marcelin et al. 2001) 1.9% (Dray et al. 2005) 3.4% (Massenet and Bouh 1997)
Egypt, Arab Republic of	0.0% (Constantine et al. 1990) 0.0% (El-Ghazzawi, Hunsmann, and Schneider 1987) 0.0% (Kandela 1993) 0.02% (Watts et al. 1993) 0.0% (Quinti et al. 1995)
Iran, Islamic Republic of	0.0018% (Rezvan, Abolghassemi, and Kafiabad 2007) 0.009% (Rezvan, Abolghassemi, and Kafiabad 2007) 0.005% (Rezvan, Abolghassemi, and Kafiabad 2007) 0.005% (Rezvan, Abolghassemi, and Kafiabad 2007) 0.0% (Pourshams et al. 2005) 0.003% (Khedmat et al. 2007)
Jordan	0.004% (Al Katheeb, Tarawneh, and Awidi 1988) 0.0% (Jordan National AIDS Program, personal communication)
Kuwait	0.01% (Kuwaitis; Ameen et al. 2005) 0.00% (non-Kuwaiti Arabs; Ameen et al. 2005)
Mauritania	0.6% (WHO 2002) 0.8% (WHO 2002)
Morocco	0.02% (Elmir et al. 2002; Elharti 2002)
Pakistan	0.15% (Abdul Mujeeb and Hashmi 1988) 0.0% (Mujeeb et al. 1991) 0.003% (Kayani et al. 1994) 0.052% (Pakistan National Institute of Health 1992) 0.064% (Pakistan National Institute of Health 1995) 0.02% (Kakepoto et al. 1996) 0.0% (Iqbal and Rehan 1996) 0–0.06% (Sultan, Mehmood, and Mahmood 2007) 0.0% (college students; Mujeeb, Aamir, and Mehmood 2006; Abdul Mujeeb, Aamir, and Mehmood 2000)
Qatar	0.03% (Qatar 2008)
Saudi Arabia	0.02% (Al Rasheed et al. 1988) 0.0% (El-Hazmi 2004) 0.0% (Alamawi et al. 2003)
Somalia	1.0% (Kulane et al. 2000) 0.8% (WHO 2003)
Sudan	0–11% (various locations; Southern Sudan; NSNAC and UNAIDS 2006) 7.0% (Labone; Southern Sudan; NSNAC and UNAIDS 2006) 13.5% (Chukudum; Southern Sudan; NSNAC and UNAIDS 2006) 12.7% (Yei; Southern Sudan; NSNAC and UNAIDS 2006) 0.05% (Hashim et al. 1997) 0.9% (Winsbury 1996) 0.8–1.8% (WHO/EMRO 2007a) 1.25% (SNAP 2008)

Table 6.3 (Continued)

Country	HIV prevalence
Turkey	0.005% (Afsar et al. 2008) 0.0% (Afsar et al. 2008) 0.0% (Afsar et al. 2008) 0.015% (Coskun et al. 2008) 0–0.66% (Arabaci et al. 2003)
West Bank and Gaza	0.006% (Maayan et al. 1994) 0.0% (Yassin et al. 2001)
Yemen, Republic of	0.1–0.3% (WHO/EMRO 2007a) 0.04% (Yemen National AIDS Control Programme 1998) 0.29% (Yemen National AIDS Control Programme 2001) 0.02% (WHO/EMRO Regional Database on HIV/AIDS)

of these countries, as defined technically by prevalence larger than 1% among pregnant women.¹

Southern Sudan is of particular concern and could already be in a state of general population HIV epidemic, but conclusive evidence is still lacking. Technically speaking, the HIV epidemics in Djibouti and parts of Somalia are already generalized, but the context of HIV infection and risk groups in these countries suggest that HIV dynamics are mainly focused around concentrated epidemics in the commercial sex networks. The generalization of the epidemic, being larger than 1% among pregnant women, mainly reflects the large commercial sex networks in these countries in the context of major trade corridors, large foreign military installations, and political conflict. HIV prevalence in these countries is also much lower than HIV prevalence in countries in sub-Saharan Africa that truly have a general population HIV epidemic.²

GENERAL POPULATION AND RISK BEHAVIOR

Data on sexual behavior among the general population continue to be rather limited. In particular, it does not appear that any nationwide sexual behavior survey has ever been conducted in MENA. Several studies, however, collected a reasonable amount of data in a few countries and these data provide a partial profile of sexual behavior in the general population. Below is a review of evidence on different aspects of risky

behavior among the general population, including the nature of sexual behavior, nonconventional marriage forms and polygamy, and the overall nature and trends of risky behavior. Further data on sexual risk behavior among key vulnerable subgroups in the general population, such as prisoners, youth, and mobile populations, can be found in chapter 9. Further data on condom use and HIV knowledge and attitudes in the general population can be found in chapter 8. Levels of sexually transmitted infections (STIs) in the general population can be found in chapter 10.

Nature of sexual behavior

Two case-control studies in Algeria and Morocco examining the epidemiology of human papillomavirus (HPV) infection, an STI that causes cervical cancer, provided valuable data on the sexual behavior of general population women who were in the control arm of this study. In the Algeria study, almost 30% of women reported more than one lifetime sexual partner, with 5% reporting three or more partners.³ Twenty-six percent of the women reported that their husbands had extramarital affairs with other women and 25% were unsure about their husbands' extramarital affairs. Thirty-four percent reported that their husbands had sex with female sex workers (FSWs) and 10% were unsure about their husbands' contacts with FSWs. Women in polygamous marriages (6% of women) were at higher risk of cervical cancer, suggesting that polygamy implies a higher level of sexual risk

¹ Pisani et al., "HIV Surveillance."

² UNAIDS/WHO, *AIDS Epidemic Update 2007*.

³ Hammouda et al., "Cervical Carcinoma in Algiers."

behavior than monogamy. Widowed and divorced women were also at higher risk of cervical cancer, also suggesting higher levels of sexual risk behavior. The pattern of apparently higher levels of risky behavior among widowed or divorced women was also seen in Djibouti, where single, divorced, separated, or widowed women were found to have significantly higher HIV prevalence (8.2%) compared to married women (2.3%).⁴

In the Morocco study, almost 20% of women reported more than one lifetime sexual partner, with 2% reporting more than three partners.⁵ Six percent reported having more than one partner before reaching 20 years of age, and 2% reported having nonspousal sexual partnerships. One woman out of 203 women reported engaging in sex work. The study also reported a mean of 1.3 lifetime sexual partners, a median of 1, and a range of 1–4, and that the median age at first sex was 18 years. Condom use was limited with only 16% of women having ever used condoms. Polygamous unions were reported by 12% of women and polygamy was associated with cervical cancer, although not with statistical significance as in the Algeria study.⁶

A behavioral surveillance study among the general population in Juba, Southern Sudan, also provided valuable data.⁷ Thirty-one percent of unmarried men 15–24 years of age and 62% of unmarried men 25–49 years of age had ever had sex.⁸ Among women, the corresponding percentages were 8 and also 8, respectively.⁹ Casual sex in the last year was reported by 11.7% of men and 1.5% of women.¹⁰ The mean number of casual partners in the last year among those who had casual sex was two for both men and women.¹¹ Casual sex was found to be much more common among unmarried men (19%) than married men (4%).¹² In the last year, 1.7% of men¹³ reported paying for sex and 0.2% of

women reported exchanging sex for money.¹⁴ Three percent of women, but no men, reported ever being forced to have sex.¹⁵

Other studies have provided further data on sexual behavior. In Afghanistan, studies found that 0.2% and 0.7% of spouses reported that their husbands engaged in extramarital sexual contacts with men or boys, and other women, respectively.¹⁶ In the Islamic Republic of Iran, among runaways and other women seeking safe haven, 40% of those sexually active reported that their first sexual contact was with someone other than their husband, and 6% reported a history of rape.¹⁷ In another study, 38% of clients of FSWs were married, suggesting that marriage does not preclude contact with FSWs.¹⁸

In Lebanon, 62.8% of the general population in one study had their first sexual intercourse prior to age 20, 32.1% had multiple sexual partners, 22.4% had casual sex, and 36% had paid for sex.¹⁹ In another study, 52% of men were sexually active before age 20, and 22% of unmarried men had sexual relations with non-regular partners.²⁰ In a third study, 30.8% of the general population was sexually active but unmarried, and 13% of them had nonspousal regular partners.²¹ Of those who reported nonspousal regular partners, almost 20% had more than one partner. Of the respondents, 33.3% had their sexual debut between the ages of 15 and 20 years, and 42.9% were sexually active by age 25.²² Among the sexually active population, 16.8% had nonregular sexual partners and 31.4% paid money or gifts for sex.²³

In Pakistan, 6% of general population respondents had extramarital affairs and only 5% had ever used condoms.²⁴ In another study, the average frequency of coital acts, whether marital or extramarital, was 3.5 per week.²⁵ In

⁴ Unknown, "Surveillance des infections à VIH."

⁵ Chaouki et al., "The Viral Origin of Cervical Cancer."

⁶ Hammouda et al., "Cervical Carcinoma in Algiers."

⁷ UNHCR, "HIV Behavioural Surveillance Survey."

⁸ Ibid.

⁹ Ibid.

¹⁰ Ibid.

¹¹ Ibid.

¹² Ibid.

¹³ Ibid.

¹⁴ Ibid.

¹⁵ Ibid.

¹⁶ Todd et al., "Seroprevalence and Correlates of HIV" (2008).

¹⁷ Hajjabdolbaghi et al., "Insights from a Survey."

¹⁸ Zargooshi, "Characteristics of Gonorrhoea."

¹⁹ Lebanon National AIDS Control Program, "General Population Evaluation Survey."

²⁰ WHO/EMRO, "Prevention and Control of Sexually Transmitted Infections."

²¹ Jurjus et al., "Knowledge, Attitudes, Beliefs, and Practices."

²² Ibid.

²³ Ibid.

²⁴ Raza et al., "Knowledge, Attitude and Behaviour."

²⁵ Naim and Bhutto, "Sexuality during Pregnancy."

Oman, 13% of male members of social clubs reported extramarital relations in the last year.²⁶ In Somalia, 34% of general population men and 22.5% of general population women had more than one sexual partner in the previous year.²⁷ The average age at first sex was 17 years for males and 15 years for females.²⁸ Also in Somalia, 32% of women attending STD (sexually transmitted disease) clinics were unmarried,²⁹ and 4% of pregnant women attending ANC centers were also unmarried.³⁰ Among Somali refugees in Kenya, HIV prevalence was associated with polygamy, although not with statistical significance.³¹

In Sudan, 14.9% of males and 5.7% of females of mainly rural populations in six states reported extramarital sex at the present time, but only 2.2% of males and 1.2% of females used condoms during last sex.³² Sexual contacts between males were reported by 2% of the males, and commercial sex was reported by 3.1% of males and 1.4% of females.³³ In further studies from Sudan, 12% of adults reported a nonregular sexual partner in the last year,³⁴ and premarital or extramarital sex was reported by 14.4% of university students,³⁵ 5.4% of ANC women attendees,³⁶ 10.3% of tea sellers,³⁷ and 15.3% of tuberculosis (TB) patients.³⁸ Furthermore, premarital sex was reported by 1.2% of ANC women attendees,³⁹ 0.5% of tea sellers,⁴⁰ and 1% of TB patients.⁴¹ In Southern Sudan, 44% of sexually active men and 4% of women reported that they have had sex with another person apart from their spouse or regular sexual partner.⁴² Median age at first sex was

13.8 for males and 18 for females.⁴³ Recent extramarital sex was reported by 4.5% of males and 1.7% of females.⁴⁴

Nonconventional marriage forms and polygamy

Anecdotal evidence suggests an increasing prevalence of nonconventional forms of marriage in MENA.⁴⁵ One of these forms is *zawaj al-muta'a* or *sigheh* (temporary marriage), sanctioned among Shiites, but not among Sunnis, and common in the Islamic Republic of Iran and Lebanon.⁴⁶ This form of marriage is legally permitted in the Islamic Republic of Iran and consists of a marriage contract between a man and a woman agreeing, often privately and verbally, to marry each other for a fixed term that can range from 1 hour to 99 years.⁴⁷ *Sigheh* appears to be common in the Islamic Republic of Iran, such as among divorced women with limited financial resources.⁴⁸ It was also encouraged by political leaders following the Islamic Revolution and is seen as an alternative to premarital or extramarital sex.⁴⁹ Over a quarter of the youth (27.1%) in the Islamic Republic of Iran and almost half of the truck drivers (43.3%) found *sigheh* more acceptable than extramarital sex.⁵⁰ Institutionalizing temporary marriages through the construction of "chastity houses," where women would be paid for sex according to some established rules, was suggested by some scholars in the Islamic Republic of Iran, but this was never enacted.⁵¹

Another form of nonconventional marriage is *'urfi* marriage (clandestine marriage).⁵² This form is religiously sanctioned among Sunnis and Shiites, but has no legal bearings. It is most common in the Arab Republic of Egypt and there is anecdotal evidence suggesting that it is increasing in prevalence in this country.⁵³ While there are no reliable estimates of the number of

²⁶ Jenkins and Robalino, "HIV in the Middle East and North Africa."

²⁷ WHO/EMRO, "Presentation of WHO Somalia's Experience."

²⁸ WHO, *2004 First National Second Generation HIV/AIDS/STI Sentinel Surveillance Survey (Somalia)*.

²⁹ Somaliland Ministry of Health and Labour, *Somaliland 2007*.

³⁰ WHO, *2004 First National Second Generation HIV/AIDS/STI Sentinel Surveillance Survey (Somalia)*.

³¹ UNHCR, *HIV Sentinel Surveillance among Antenatal Clients*.

³² SNAP, UNICEF, and UNAIDS, "Baseline Study on Knowledge."

³³ Ibid.

³⁴ SNAP, *Situation Analysis*.

³⁵ Ahmed, *University Students*.

³⁶ Ahmed, *Antenatal*.

³⁷ Ahmed, *Tea Sellers*.

³⁸ Ahmed, *TB Patients*.

³⁹ Ahmed, *Antenatal*.

⁴⁰ Ahmed, *Tea Sellers*.

⁴¹ Ahmed, *TB Patients*.

⁴² NSNAC and UNAIDS, *HIV/AIDS Integrated Report South Sudan*.

⁴³ Ibid.

⁴⁴ Ibid.

⁴⁵ Rashad and Osman, "Nuptiality in Arab Countries."

⁴⁶ Roudi-Fahimi and Ashford, "Sexual & Reproductive Health."

⁴⁷ Mohammad et al., "Sexual Risk-Taking Behaviors among Boys"; Haeri, "Temporary Marriage."

⁴⁸ Aghajanian, *Family and Family Change in Iran*.

⁴⁹ Haeri, "Temporary Marriage."

⁵⁰ Tehrani and Malek-Afzalip, "Knowledge, Attitudes and Practices."

⁵¹ Sepehrad, "The Role of Women"; Recknagel and Gorgin, "Iran."

⁵² Roudi-Fahimi and Ashford, "Sexual & Reproductive Health"; DeJong et al., "The Sexual and Reproductive Health of Young People."

⁵³ Beamish, "Adolescent Reproductive Health in Egypt."

'urfi marriages, there were nearly 10,000 cases of contested paternity due to 'urfi marriages in Egyptian courts in 1998.⁵⁴

A third type of nonconventional marriage is "travelers' marriage," including "summer marriages" and *jawaz* (or *nikah al misyar*). Summer marriages typically occur between wealthy tourists from rich MENA countries and poor women or girls from poor MENA countries, and last only for the duration of the summer, after which the marriage is often dissolved.⁵⁵ *Jawaz al misyar* is common mainly in the Persian Gulf region and is an arrangement by which a man marries without the housing and financial responsibilities that are expected from him in a conventional marriage.⁵⁶ The couples continue to live separately from each other and see each other when they please. *Jawaz al misyar* is generally sanctioned among Sunnis, but is forbidden among Shiites.

There is very limited evidence on the levels of sexual risk behavior implied by these kinds of marriages and whether they are effectively a "legitimization" of premarital and extramarital sex. One study in the Islamic Republic of Iran reported that temporary marriages appear to be associated with exposure to STIs. Twenty-four percent of male gonorrhea patients reported acquiring the infection from temporary wives.⁵⁷

Although polygamy is common in MENA, it appears to be in decline.⁵⁸ The percentage of women in polygamous unions is estimated (not necessarily from representative populations) at 6% in Algeria,⁵⁹ 6.8% in Jordan,⁶⁰ 12.5% in Kuwait,⁶¹ 3% in Lebanon,⁶² 12% in Morocco,⁶³ 5% in the Syrian Arab Republic,⁶⁴ and 26% in the United Arab Emirates.⁶⁵ Among Somali refugees in Kenya, 18.7% of married women were in polygamous unions.⁶⁶ In Sudan, the percentage of people of different population groups who reported having more than one husband/

wife was 0% among university students,⁶⁷ 7% among military personnel,⁶⁸ 24.2% among married military personnel,⁶⁹ 14.5% among prisoners,⁷⁰ 12.6% among truck drivers,⁷¹ 13% among internally displaced persons,⁷² 14.2% among tea sellers,⁷³ 1.8% among street children,⁷⁴ 11.8% among ANC women attendees,⁷⁵ 14.1% among FSWs,⁷⁶ 13.3% among TB patients,⁷⁷ 15.7% among STD clinic attendees,⁷⁸ and 15.7% among suspected AIDS patients.⁷⁹ There was no definition given to distinguish whether these percentages represent sequential or polygamous marriages or whether these marriages include spousal relationships not necessarily sanctioned by religion or state. These measures, however, suggest the prevalence of multiple marriages in Sudan.

Concurrency of sexual partnerships and heterogeneity in sexual risk behavior are conducive to the spread of HIV in the population.⁸⁰ Polygamy has been associated with higher risk of exposure to STIs in sub-Saharan Africa.⁸¹ The permissive attitudes toward polygamy have been suggested as an explanation of higher HIV rates among a minority of Muslim communities in sub-Saharan Africa.⁸² Polygamy was found to be associated with cervical cancer in two studies in Algeria⁸³ and Morocco.⁸⁴ Nevertheless, lower STI prevalence was reported among women in polygamous marriages compared to women in nonpolygamous marriages in the United Arab Emirates.⁸⁵ The association between polygamy

⁵⁴ Rashad et al., "Marriage in the Arab World."

⁵⁵ DeJong et al., "The Sexual and Reproductive Health of Young People."

⁵⁶ Rashad et al., "Marriage in the Arab World."

⁵⁷ Zargooshi, "Characteristics of Gonorrhoea."

⁵⁸ Foster, "Young Women's Sexuality in Tunisia."

⁵⁹ Hammouda et al., "Cervical Carcinoma in Algiers."

⁶⁰ Naffa, "Jordanian Women: Past and Present."

⁶¹ Chaleby, "Women of Polygamous Marriages."

⁶² Jurjus et al., "Knowledge, Attitudes, Beliefs, and Practices."

⁶³ Chaouki et al., "The Viral Origin of Cervical Cancer."

⁶⁴ Roudi-Fahimi and Ashford, "Sexual & Reproductive Health."

⁶⁵ Ghazal-Aswad et al., "Prevalence of Chlamydia Trachomatis Infection."

⁶⁶ UNHCR, *HIV Sentinel Surveillance among Antenatal Clients*.

⁶⁷ Ahmed, *University Students*.

⁶⁸ Ahmed, *Military*.

⁶⁹ Sudan National HIV/AIDS Control Program, *HIV/AIDS/STIs Prevalence*.

⁷⁰ Ahmed, *Prisoners*.

⁷¹ Ahmed, *Truck Drivers*.

⁷² Ahmed, *Internally Displaced People*.

⁷³ Ahmed, *Tea Sellers*.

⁷⁴ Ahmed, *Street Children*.

⁷⁵ Ahmed, *Antenatal*.

⁷⁶ Ahmed, *Sex Sellers*.

⁷⁷ Ahmed, *TB Patients*.

⁷⁸ Ahmed, *STDs*.

⁷⁹ Ahmed, *AIDS Patients*.

⁸⁰ Kretzschmar and Morris, "Measures of Concurrency in Networks"; Morris, "Sexual Networks and HIV"; Watts and May, "The Influence of Concurrent Partnerships"; May and Anderson, "The Transmission Dynamics."

⁸¹ Obasi et al., "Antibody to Herpes Simplex Virus Type 2."

⁸² Kapiga, "Determinants of Multiple Sexual Partners"; Kapiga and Lugalla, "Sexual Behaviour Patterns."

⁸³ Hammouda et al., "Cervical Carcinoma in Algiers."

⁸⁴ Chaouki et al., "The Viral Origin of Cervical Cancer."

⁸⁵ Ghazal-Aswad et al., "Prevalence of Chlamydia Trachomatis Infection."

and STI risk of exposure is complex in MENA, because polygamy tends to be associated with closed sexual networks rather than open and intertwined networks.⁸⁶ However, the above evidence does give credence to the possibility that polygamy could be associated with higher risk of exposure to STIs within the context of this region.

Overall nature and trends of sexual risk behavior

The above evidence suggests that the levels of sexual risk behavior among the general population in MENA appear to be rather low in comparison to other regions.⁸⁷ The MENA population views sex outside of marriage very negatively, particularly for women.⁸⁸ Premarital sex is one of the leading causes of suicide among young women. In Algeria, 30% of women who commit suicide are pregnant but unmarried.⁸⁹ In Turkey, hymen examination is the most frequent cause of suicide among young Turkish women.⁹⁰

Most of the sexual risk behavior appears to be practiced by men rather than women. Nevertheless, women endure a large share of the STD burden through exposures to infected husbands. Sex with an infected partner was found to be a significant predictor of women's exposure to STDs in Egypt.⁹¹ Infection with STDs in Morocco was more associated with male rather than female sexual behavior.⁹²

Most of the sexual risk behavior appears to be concentrated in, but not confined to, youth and before marriage. Eighty-one percent of STD clinic attendees in Kuwait were either single or married patients living alone.⁹³ Most of them were in the 21–30 years age group. Nonetheless, sexual risk exists for all age groups, its form varying depending on the age group.

There appears to be a substantial gap in age in sexual partnerships between men and women, with women marrying older men.

Intergenerational sex puts women at higher risk of exposure to STIs.⁹⁴ Among women who had cervical cancer and reported first marriage/intercourse before age 15 in Morocco, 57% married a husband in the 20–30 years age range and 19% married a husband older than 30 years of age.⁹⁵ Intergenerational sex has been implicated as the main reason behind the large gap in HIV prevalence between men and women in sub-Saharan Africa.⁹⁶ Though age at marriage has increased rapidly over the last three decades,⁹⁷ a substantial fraction of women still marry at an early age. Early age at marriage was found to be associated with higher risk of exposure to STIs in two studies of women in MENA.⁹⁸

While the overall levels of sexual risk behaviors appear to be rather low, there are indications that they are increasing in MENA. Behavioral surveys in Lebanon and Turkey suggest increased risky behavior among youth.⁹⁹ Anecdotal evidence points to increases in sexual activity, sexual risk behavior, and STIs among boys and girls.¹⁰⁰

MALE CIRCUMCISION

Male circumcision is nearly universal in MENA,¹⁰¹ and there is extensive scientific evidence for its protective effects against HIV, including a measured efficacy of 60% against HIV infection established in three randomized clinical trials.¹⁰² Southern Sudan is the only part of MENA where universal male circumcision is not the norm. A study in Juba, Southern Sudan, found that only 44% of men were circumcised (90% of Muslim men and 39% of non-Muslim men).¹⁰³ The prevalence of male circumcision is

⁸⁶ Huff, "Male Circumcision: Cutting the Risk?"

⁸⁷ Wellings et al., "Sexual Behaviour in Context"; Durex, "Global Sex Survey 2005."

⁸⁸ Sakalli-Ugurlu and Glick, "Ambivalent Sexism."

⁸⁹ International Planned Parenthood Federation, "Unsafe Abortion."

⁹⁰ Gursoy and Vural, "Nurses' and Midwives' Views."

⁹¹ Mostafa and Roshdy, "Risk Profiles."

⁹² Ryan et al., "Reproductive Tract Infections."

⁹³ Al-Mutairi et al., "Clinical Patterns."

⁹⁴ Chaouki et al., "The Viral Origin of Cervical Cancer"; Burchell et al., "Chapter 6."

⁹⁵ Chaouki et al., "The Viral Origin of Cervical Cancer."

⁹⁶ Hallett et al., "Behaviour Change"; Gregson et al., "Sexual Mixing Patterns."

⁹⁷ Rashad, "Demographic Transition."

⁹⁸ Chaouki et al., "The Viral Origin of Cervical Cancer"; Hassen et al., "Cervical Human Papillomavirus Infection."

⁹⁹ Kassak et al., "Final Working Protocol"; Yamazhan et al., "Attitudes towards HIV/AIDS."

¹⁰⁰ Busulwa, "HIV/AIDS Situation Analysis Study."

¹⁰¹ Weiss et al., "Male Circumcision."

¹⁰² Avert et al., "Randomized, Controlled Intervention Trial"; Bailey et al., "Male Circumcision"; Gray et al., "Male Circumcision."

¹⁰³ UNHCR, "HIV Behavioural Surveillance Survey."

probably lower in the rural areas in Southern Sudan, out of Juba. Male circumcision should be considered as a prevention intervention for HIV in Southern Sudan. It must be stressed, however, that male circumcision is only partially protective and does not fully prevent HIV infection.

Female "circumcision," more appropriately labeled as female genital mutilation, is also prevalent in several MENA countries and is not associated with any protective effects against HIV.¹⁰⁴ The prevalence of female genital mutilation is estimated at 98% in Djibouti,¹⁰⁵ 97.3% in Egypt,¹⁰⁶ 94% in southern Somalia,¹⁰⁷ 89% in Sudan,¹⁰⁸ and 22.6% in the Republic of Yemen.¹⁰⁹ Although three-quarters of girls in Egypt undergo this procedure by medically trained personnel,¹¹⁰ this may not be the case in other countries. Female genital mutilation is associated with infections and other health complications that may potentially put females, biologically speaking, at higher risk of HIV infection.¹¹¹

ANALYTICAL SUMMARY

There is considerable evidence on the levels of HIV prevalence among the general population in MENA. HIV prevalence is very low in all countries, except Djibouti, Somalia, and Sudan. There is no evidence for a substantial HIV epidemic in the general population in any of the MENA countries.

Apart from Djibouti, Somalia, and Sudan, there appears to be very limited HIV transmission within the general population. Southern Sudan is of particular concern and could be already in a state of general population HIV epidemic, but conclusive evidence is still lacking. Though the HIV epidemic in Djibouti and parts

of Somalia is technically already generalized, the epidemiology of HIV infection in these nations suggests that there is no sustainable general population epidemic. The dynamics of HIV infection in these nations are focused mainly around concentrated epidemics in commercial sex networks in the context of special circumstances of risk and vulnerability largely not present in the rest of the MENA countries. HIV prevalence in these countries is still at levels much lower than those found in the hyperendemic HIV epidemics in sub-Saharan Africa.

Sexual behavior data in the general population in MENA remain rather limited. Existing evidence suggests that sexual risk behaviors in the general population are present, but at rather low levels in comparison to other regions. Spousal sexual partnerships in MENA seem to be in a state of change with nonconventional forms of marriage increasing in prevalence. Levels of sexual risk behavior appear to be increasing, particularly among youth, though probably not to a level that can support an HIV epidemic in the general population. Available sexual risk behavior measures suggest limited potential for a sustainable HIV epidemic in the general population in at least the foreseeable future, if ever.

STI prevalence data, including herpes simplex virus type 2 (HSV-2), HPV, syphilis, gonorrhea, and chlamydia, indicate low prevalence of these infections among the general population in MENA in comparison to other regions (chapter 10). Unsafe abortions are also at low levels in MENA compared to other regions (chapter 10). These proxy measures of sexual risk behavior imply low levels of risky behavior in MENA. This further indicates limited potential for a sustainable HIV epidemic in the general population.

Male circumcision is almost universal in MENA,¹¹² and is associated with a biological efficacy against HIV infection.¹¹³ Male circumcision is associated with lower HIV prevalence at the population level,¹¹⁴ and its role in HIV dynamics appears to be "quarantining" HIV sustainable transmission to within higher risk groups with

¹⁰⁴ DeJong et al., "The Sexual and Reproductive Health of Young People."

¹⁰⁵ Roudi-Fahimi and Ashford, "Sexual & Reproductive Health."

¹⁰⁶ El-Zanaty and Way, *Egypt Demographic and Health Survey*.

¹⁰⁷ Scott et al., "Low Prevalence of Human Immunodeficiency Virus-1."

¹⁰⁸ Sudan Department of Statistics, *Sudan Demographic and Health Survey 1989/1990*.

¹⁰⁹ Roudi-Fahimi and Ashford, "Sexual & Reproductive Health"; Yemen Central Statistical Organization, *Yemen Demographic, Maternal and Child Health Survey 1997*.

¹¹⁰ Roudi-Fahimi and Ashford, "Sexual & Reproductive Health."

¹¹¹ Obermeyer, "The Consequences of Female Circumcision"; Obermeyer, "The Health Consequences of Female Circumcision"; Bailey, Neema, and Othieno, "Sexual Behaviors."

¹¹² Weiss et al., "Male Circumcision."

¹¹³ Auvert et al., "Randomized, Controlled Intervention Trial"; Bailey et al., "Male Circumcision"; Gray et al., "Male Circumcision."

¹¹⁴ Weiss et al., "Male Circumcision"; Drain et al., "Male Circumcision."

limited inroads into the general population.¹¹⁵ This further indicates limited potential for a sustainable HIV epidemic in the general population.

At a global level, there is no evidence for a sustainable general population HIV epidemic apart from specific parts of sub-Saharan Africa.¹¹⁶ It is inconceivable that MENA will be the exception to this pattern after consistently very low HIV prevalence in the general population over the two decades since the virus's introduction into the MENA population in the 1980s.

All of the above considerations affirm that it is unlikely that the MENA region will experience a sustainable or substantial HIV epidemic in the general population in at least the foreseeable future, if ever. Nevertheless, prevention resources in MENA continue to be focused among the general population, as opposed to priority groups, despite its lowest risk of HIV exposure of all HIV risk groups. HIV programs focused on the general population in MENA should stress stigma reduction, rather than personal risk reduction, and prevention efforts should be focused on priority populations.

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Further Evidence Related to HIV Epidemiology in MENA

This chapter covers other relevant aspects of human immunodeficiency virus (HIV) epidemiology in the Middle East and North Africa (MENA) gleaned from various sources and available data.

HIV AND SEXUALLY TRANSMITTED DISEASE CLINIC ATTENDEES, VOLUNTARY COUNSELING AND TESTING ATTENDEES, AND SUSPECTED AIDS PATIENTS

HIV prevalence among sexually transmitted disease (STD) clinic attendees, voluntary counseling and testing (VCT) attendees, and suspected AIDS (acquired immune deficiency syndrome) patients has been reported for several MENA countries. Table D.1 (appendix D) lists the results of available point-prevalence surveys among these populations. Since STD clinic and VCT attendees are more likely to represent people who visited these centers because of perceived risks, the level of HIV prevalence among these populations hints at the risk of HIV exposure in a part of the population with specific identifiable risk behaviors.

There are also few measures of risky behavior among these population groups. A study on STD clinic attendees in Pakistan found that 55% acquired the STD heterosexually, 11.6% homosexually, and 18.4% bisexually.¹ Among STD

clinic attendees² and suspected AIDS patients³ in Sudan, 5.4% and 0% reported ever using a condom, 13.2% and 17.4% reported premarital and extramarital sex, 0.8% and 8.7% reported premarital sex, and 3.9% and 4.3% paid for sex, respectively. Consistently in MENA, studies report that the main source of the STD infection is sexual contact with female sex workers (FSWs), such as in the Islamic Republic of Iran,⁴ Kuwait,⁵ Pakistan,⁶ Somalia,⁷ and Sudan.⁸

Analytical summary

These results suggest that apart from Djibouti, Somalia, and Sudan, HIV prevalence among STD clinic and VCT attendees is generally low. HIV has clearly made inroads into the heterosexual high-risk networks in Djibouti, Somalia, and Sudan. The limited prevalence in the rest of the countries is likely a consequence of the low levels of HIV prevalence in the priority groups, FSWs in particular, since the main reason for attending an STD clinic in the region is sexual contact with FSWs.

² Ahmed, *STDs*.

³ Ahmed, *AIDS Patients*.

⁴ Zargooshi, "Characteristics of Gonorrhoea."

⁵ Al-Mutairi et al., "Clinical Patterns"; Al-Fouzan and Al-Mutairi, "Overview."

⁶ Rehan, "Profile of Men."

⁷ Burans et al., "HIV Infection Surveillance in Mogadishu, Somalia";

Ismail et al., "Sexually Transmitted Diseases in Men."

⁸ Omer et al., "Sexually Transmitted Diseases in Sudanese Males."

¹ Rehan, "Profile of Men."

Available data illustrate that the passive facility-based surveillance at STD clinics and VCT centers is to a large extent not capturing the dynamics of HIV transmission in MENA. An active surveillance among priority populations incorporating an integrated biobehavioral surveillance methodology would be a much more effective approach in generating interpretable data on HIV epidemiology in MENA.

HIV/AIDS AMONG TUBERCULOSIS PATIENTS

HIV/AIDS among tuberculosis (TB) patients is a useful indicator of the maturity of the HIV epidemic in a given setting because it reflects the presence of advanced HIV or AIDS cases in the population. Table D.2 (appendix D) summarizes the results of available point-prevalence surveys among TB patients.

Analytical summary

Available prevalence surveys among TB patients suggest that apart from Djibouti, Somalia, and Sudan, HIV prevalence among TB patients is generally low. HIV has clearly been making inroads into a subset of the populations in Djibouti, Somalia, and Sudan for at least a decade. The limited prevalence among TB patients in the rest of MENA countries is probably a consequence of either the recent introduction of HIV into high-risk networks or the very low levels of HIV prevalence in the whole population, except possibly for small pockets of high-risk priority groups.

FURTHER POINT-PREVALENCE SURVEYS

Table D.3 (appendix D) lists a summary of point-prevalence surveys extracted from the United Nations Joint Programme on HIV/AIDS (UNAIDS) epidemiological facts sheets on each MENA country over the years. Some of the data reported here are gleaned from country-based case notification surveillance reports⁹ or are provided through national-level agencies. These surveys may not be conducted using sound methodology or internationally accepted guide-

lines for HIV surveillance. There is also very limited information on the populations on which these measurements were made. Given these limitations, the prevalence levels may not be representative of the populations that they are supposed to represent. However, despite these limitations, these measures are useful to corroborate the rest of the point-prevalence surveys discussed in the previous chapters and, indeed, convey the same picture of HIV epidemiology in MENA.

Analytical summary

The further point-prevalence surveys in table D.3 are generally consistent with those reported in the previous chapters and follow similar patterns. Injecting drug users (IDUs) and men who have sex with men (MSM) are the key priority groups for HIV infectious spread in MENA, followed by FSWs, but mainly in Djibouti, Somalia, and Sudan. There is very limited HIV prevalence in the general population.

The fluctuations among some of these data may suggest a lack of representation. To maximize the explanatory power of point-prevalence data, MENA countries need to conduct point-prevalence measurements using consistent and standard methodology and internationally accepted guidelines for HIV surveillance.

HIV-POSITIVE RESULTS EXTRACTED FROM HIV/AIDS CASE NOTIFICATION SURVEILLANCE REPORTS

Many countries in MENA routinely test different population groups for HIV. These groups include blood tissue and organ donors, blood recipients, pregnant women, marriage applicants, university students, public sector employees, out-migrants (for visa to work abroad), in-migrants (for residency or visa renewal), prisoners, TB patients, suspected AIDS cases, VCT attendees, STD clinic attendees, sexual contacts of people living with HIV (PLHIV), “bar girls,” FSWs, MSM, drug users, and IDUs.

The results of 53 million HIV tests reported to the World Health Organization (WHO), as part of the HIV/AIDS case notification surveillance reports, show an overall prevalence of

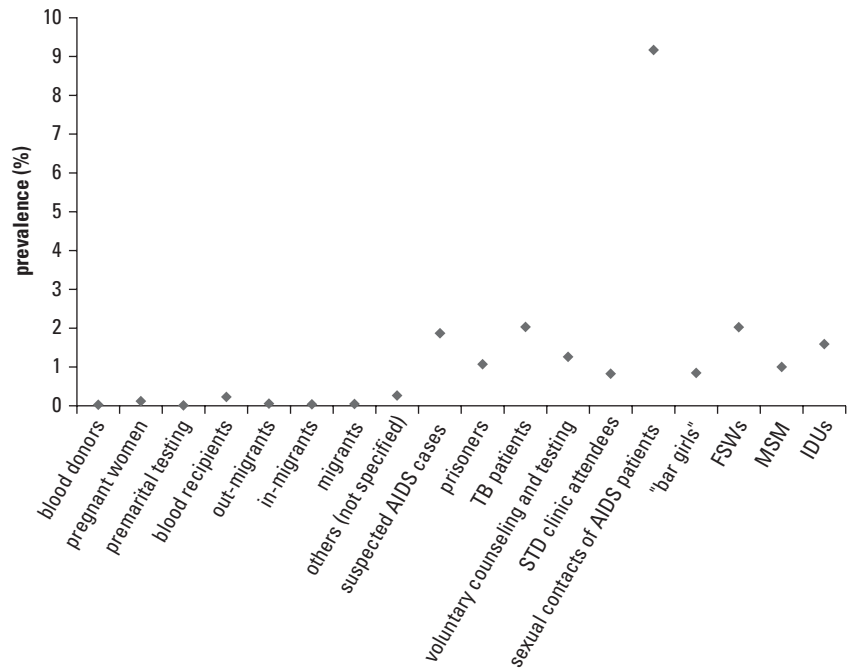
⁹ WHO/EMRO Regional Database on HIV/AIDS.

0.09%.¹⁰ Figure 7.1 displays the percentage of these tests that were positive among different population groups.¹¹ Figure 7.2 shows the distribution of HIV tests by population group. Not all countries report these tests and among those that do, they may not do so consistently. Therefore, these point-prevalence measurements may be subject to different kinds of selection bias, such as reflecting measurements from a few countries as opposed to others. There is also substantial intercountry and inter-population variability in HIV prevalence across these measures, suggesting the lack of representation.

The pattern emerging in these testing reports is that of consistently very low HIV prevalence in the general population in the majority of countries. HIV prevalence is nearly nil among blood donors, pregnant women, marriage applicants, kidney donors, and migrants. In over 3 million HIV tests conducted in the Syrian Arab Republic over eight years up to 2003, less than 300 HIV cases were identified.¹² Most HIV infections are found among priority and vulnerable populations, their sexual partners, or in populations with suspected infection or identifiable risks. Even in these populations, the majority of testing reports show relatively low HIV prevalence.

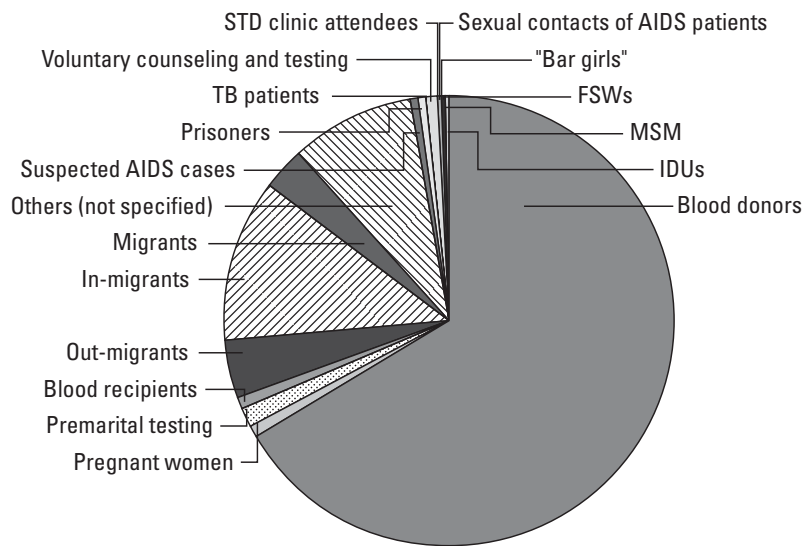
It is evident in figure 7.2 that the vast majority of HIV tests in MENA are conducted on populations at low risk of HIV infection. This suggests that resources may not be prioritized for testing the priority groups at high risk of infection. HIV testing in MENA appears to be disconnected with the reality of HIV epidemiology in the region. The reported numbers of positive tests have also fluctuated substantially in several countries in

Figure 7.1 Fraction of HIV Tests That Are Positive in Different Population Groups in MENA



Source: WHO/EMRO Regional Database on HIV/AIDS.

Figure 7.2 Distribution of HIV Tests in MENA by Population Group



Source: WHO/EMRO Regional Database on HIV/AIDS.

recent years. These fluctuations confirm the nonsustained and sporadic nature of HIV testing and the lack of standard and effective methodological surveillance by MENA countries. The Islamic Republic of Iran, for example, observed two large blips in reported cases in 1996 and 2001, which turned out to be

¹⁰ Ibid.

¹¹ Ibid.

¹² Syria National AIDS Programme, "HIV/AIDS Female Sex Workers."

due to two testing campaigns in prisons in these respective years.¹³

Analytical summary

HIV prevalence in HIV testing surveys is generally consistent with the levels reported in the previous chapters and follows a similar pattern. There is very limited HIV prevalence in the general population. Most HIV infections are found among priority and vulnerable populations, their sexual partners, or in populations with suspected infection or identifiable risks.

Resources are not prioritized to testing high-risk priority groups. HIV testing appears to be disconnected with the reality of HIV epidemiology in MENA.

The fluctuations in the testing results suggest a lack of representation and nonsustained and sporadic HIV testing. There is no consistent, standard, and effective methodological surveillance in the countries of the region. Surveillance capacity needs to be enhanced and HIV testing procedures need to be standardized to generate interpretable data on HIV epidemiology. Tens of millions of HIV tests are routinely conducted every year in MENA, but these valuable data sources are not being utilized because of a lack of scientific capacity and methodological rigor.

DISTRIBUTION BY SEX OF REPORTED HIV CASES

Until recently, the vast majority of HIV infections in most countries in MENA were found among men. Men were 10, 4.4, 8.5, 1.6, 7, 3, and 2 times as likely as women to be infected in Bahrain,¹⁴ Israel (Arab Israelis),¹⁵ Lebanon,¹⁶ Morocco,¹⁷ Pakistan,¹⁸ Saudi Arabia,¹⁹ and

Sudan,²⁰ respectively. The percentages of HIV infections that are among men are 81% in the Arab Republic of Egypt,²¹ 94% in the Islamic Republic of Iran,²² 81.75% in Lebanon,²³ 70% in Oman,²⁴ 88.4% (up to 1997) in Pakistan,²⁵ and 79.4% in the West Bank and Gaza.²⁶ In Lebanon, the disease burden among men has even increased. The ratio of males versus females was 3.6 to 1 in the years 1984 to 1998,²⁷ but it increased to 8.5 to 1 by 2004.²⁸

Nevertheless, the overall pattern in MENA appears to include an increasing proportion of females among HIV cases, such as in Algeria, Djibouti, Morocco, Pakistan, Sudan, and the Republic of Yemen.²⁹ In Algeria, the ratio of men to women decreased from 5.1 at the beginning of the epidemic to 1.1 in 2004.³⁰ The proportion of infections in women in Morocco has steadily increased to reach almost 50%, compared to 20% only five years earlier.³¹ The ratio of men to women in the Republic of Yemen decreased from 4 to 1 in 1995, to 2 to 1 in 1999, and to 1 to 1 in 2000.³² In Djibouti, the country with the highest HIV prevalence in MENA, women are already more affected by the disease than men. The prevalence is 3.6% among women and 3.1% among men in Djibouti-ville, and 1.7% among women and 0.3% among men in the rest of the country.³³

Analytical summary

Most HIV infections in most MENA countries continue to be among men. This reflects the reality that most risk behaviors are practiced by

¹³ Gheiratmand et al., "Uncertainty on the Number of HIV/AIDS Patients."

¹⁴ Al-Haddad et al., "HIV Antibodies."

¹⁵ Chemtob and Srour, "Epidemiology of HIV Infection."

¹⁶ Jurjus et al., "Knowledge, Attitudes, Beliefs, and Practices."

¹⁷ Elharti et al., "Some Characteristics of the HIV Epidemic in Morocco."

¹⁸ Rajabali et al., "HIV and Homosexuality in Pakistan"; UNAIDS and WHO, *AIDS Epidemic Update 2006*.

¹⁹ UNAIDS and WHO, *AIDS Epidemic Update 2006*.

²⁰ Sudan National HIV/AIDS Control Program, *Annual Report*.

²¹ WHO/EMRO Regional Database on HIV/AIDS.

²² Iran Center for Disease Management, *AIDS/HIV Surveillance Report*.

²³ Kassak et al., "Final Working Protocol."

²⁴ Tawilah and Tawil, *Visit to Sultane of Oman*.

²⁵ Khan and Hyder, "HIV/AIDS among Men."

²⁶ UNAIDS, "Key Findings."

²⁷ Kalaajieh, "Epidemiology of Human Immunodeficiency Virus."

²⁸ Jurjus et al., "Knowledge, Attitudes, Beliefs, and Practices."

²⁹ UNAIDS, "Notes on AIDS in the Middle East and North Africa"; Iqbal and Rehan, "Sero-Prevalence of HIV"; Kayani et al., "A View of HIV-I Infection in Karachi."

³⁰ Algeria MOH, "Rapport de l'enquête nationale de séro-surveillance."

³¹ UNAIDS, "Notes on AIDS in the Middle East and North Africa"; Morocco MOH, "Situation épidémiologique"; Elharti et al., "Some Characteristics of the HIV Epidemic in Morocco."

³² Lambert, "HIV and Development Challenges"; Al-Serouri, *HIV/AIDS Situation and Response Analysis Report*.

³³ WHO, "Summary Country Profile."

men rather than women. However, the proportion of females among PLHIV appears to be increasing. This pattern may suggest a maturation of the second wave of infection spread from men with identifiable risk behaviors to their wives, who are vulnerable to the infection despite engaging in no risky behavior of their own. HIV infections are repeatedly found among women with no identifiable risk behaviors, suggesting that the risk factor is heterosexual sex with the spouse.³⁴

TRANSMISSION MODES

All transmission modes reported globally have been documented in MENA. There is considerable variability in which transmission mode is most common across MENA countries (table 7.1). Of the total number of reported HIV infections in the WHO/EMRO database of HIV/AIDS case notification surveillance reports,³⁵ the main transmission mode is unprotected vaginal and anal sex, followed by drug injection.³⁶ In a substantial percentage of HIV infections, the transmission mode continues to be characterized as unknown, such as in Saudi Arabia, where 26% of HIV infections appear to be with no reported identifiable risk factors.³⁷ Table 7.1 lists the transmission modes for a number of MENA countries.

Analytical summary

The MENA region is experiencing the same HIV transmission modes that exist in the rest of the regions. There is variability in the dominant transmission modes across MENA countries, reflecting the status of HIV dynamics in these countries. In countries with apparently no significant endemic transmission of HIV, the dominant mode is that of heterosexual sex, apparently reflecting mainly exogenous HIV infections related to exposures abroad among the nationals of these countries, or HIV transmissions to their sexual partners upon their

return. In the rest of the countries with endogenous HIV epidemics, the dominant transmission mode reflects the nature of the epidemics in these countries. For example, the dominant transmission mode in the Islamic Republic of Iran is injecting drug use, while the dominant mode in Sudan is heterosexual sex, echoing the nature of the epidemics in these two countries.

PATTERN OF EXOGENOUS HIV EXPOSURES IN MENA

HIV epidemiology in MENA exhibits one key aspect not captured in the conceptual framework used to understand HIV epidemiology (chapter 1). In a few MENA countries, there appears to be very limited endemic transmission of HIV in all of the population groups within the country, including priority populations. The number of newly diagnosed HIV infections continues to be rather stable, at low frequency with the majority reflecting sexual and injecting exposures abroad among the nationals of these countries, or HIV transmissions to their sexual partners upon their return.³⁸ The high mobility and migration levels are the drivers of this pattern, which has been persistent since the discovery of the epidemic, and continues to be seen even among recent HIV infections. In Jordan, in 450 out of 501 notified HIV/AIDS cases by 2006, HIV infections were acquired abroad.³⁹ In Lebanon, 45.36% of notified HIV/AIDS cases up to 2004 were linked to travel abroad.⁴⁰ Half of reported AIDS cases in the Republic of Yemen were linked to a travel history abroad.⁴¹ It bears notice that some of these exposures, though exogenous to the country of the national, may still reflect exposures in another MENA country.

Analytical summary

HIV epidemiology in a few MENA countries appears to be dominated by the pattern of exogenous HIV exposures among the nationals

³⁴ Aidaoui, Bouzbid, and Laouar, "Seroprevalence of HIV Infection."

³⁵ WHO/EMRO Regional Database on HIV/AIDS.

³⁶ UNAIDS, "Notes on AIDS in the Middle East and North Africa."

³⁷ UNAIDS and WHO, *AIDS Epidemic Update 2006*.

³⁸ WHO/EMRO Regional Database on HIV/AIDS; L. J. Abu-Raddad, personal discussions with members of National AIDS Programs in MENA during 2006–9.

³⁹ Jordan National AIDS Program, personal communication.

⁴⁰ Jurjus et al., "Knowledge, Attitudes, Beliefs, and Practices."

⁴¹ WHO, UNICEF, and UNAIDS, "Yemen, Epidemiological Facts Sheets."

Table 7.1 HIV Transmission Modes for a Number of MENA Countries

Country	Heterosexual transmission	Homosexual transmission	Injecting drug transmission	Blood or blood products transmission	Mother-to-child transmission
Algeria	45.71% (Algeria MOH [unknown])				
Egypt, Arab Republic of	50.0% (UNAIDS and WHO 2005)	20.0% (UNAIDS and WHO 2005)			
Iran, Islamic Republic of			87.0% (Iran Center for Disease Management 2004) 82.0% (Gouya 2006) 78.0% (Hamadan province; Ghannad et al. 2009)	1.8% (Ministry of Health and Medical Education of Iran 2006) 0.35% (Hamadan province; Ghannad et al. 2009)	0.5% (Ministry of Health and Medical Education of Iran 2006) 1.0% (Hamadan province; Ghannad et al. 2009)
Jordan	52.0% (Jordan National AIDS Program, personal communication)		4.3% (Anonymous 2006)	31.0% (Jordan National AIDS Program, personal communication) 19.0% (UNAIDS 2006b)	1.7% (Anonymous 2006)
Kuwait	48.0% (Al-Fouzan and Al-Mutairi 2004)				
Lebanon	53.0% (Lebanon National AIDS Control Program 2008) 53.9% (up to 1998; Kalaajieh 2000) 56.0% (Kassak et al. 2008)	16.0% (Lebanon National AIDS Control Program 2008) 15.68% (Jurjus et al. 2004)	6.0% (Lebanon National AIDS Control Program 2008)	7.0% (Lebanon National AIDS Control Program 2008) 8.5% (up to 1998; Kalaajieh 2000)	3.0% (Lebanon National AIDS Control Program 2008) 4.3% (Kalaajieh 2000)
Morocco	77.0% (Elharti et al. 2002) 72.0% (Elharti et al. 2002) 80.0% (Alami 2009) 83.0% (Morocco MOH [unknown])	7.0% (Elharti et al. 2002) 4.0% (Alami 2009)	11.0% (Elharti et al. 2002) 4.0% (Alami 2009)	0.62% (Elharti et al. 2002) 1.0% (Alami 2009)	4.63% (Elharti et al. 2002) 3.0% (Alami 2009)
Pakistan		3.2% (Khan and Hyder 1998) 7.0% (Rajabali et al. 2008; UNAIDS and WHO 2006)			
Qatar	Main transmission mode (Qatar 2008)				

Table 7.1 (Continued)

Country	Heterosexual transmission	Homosexual transmission	Injecting drug transmission	Blood or blood products transmission	Mother-to-child transmission
Saudi Arabia	37.9% (Al-Mazrou et al. 2005)	2.5% (Al-Mazrou et al. 2005)	1.3% (Al-Mazrou et al. 2005)	25.0% (Al-Mazrou et al. 2005)	6.5% (Al-Mazrou et al. 2005)
	46.0% (Alrajhi, Halim, and Al-Abdely 2004)	5.0% (Alrajhi, Halim, and Al-Abdely 2004)	2.0% (Alrajhi, Halim, and Al-Abdely 2004)	26.0% (Alrajhi, Halim, and Al-Abdely 2004)	12.0% (Alrajhi, Halim, and Al-Abdely 2004)
Sudan	97.0% (UNAIDS and WHO 2007; SNAP, UNICEF, and UNAIDS 2005; Farah and Hussein 2006)				
Syrian Arab Republic	70.0% (Syria National AIDS Programme 2004)	8.0% (Syria National AIDS Programme 2004)	4.0% (Syria National AIDS Programme 2004)	12.0% (Syria National AIDS Programme 2004)	3.0% (Syria National AIDS Programme 2004)
Tunisia	56.3% (Kilani et al. 2007)	6.5% (men; Hsairi and Ben Abdallah 2007)	37.1% (Hsairi and Ben Abdallah 2007)		
	75.0% (women; Zouiten et al. 2002)				
	67.2% (women; Hsairi and Ben Abdallah 2007)				
	25.7% (men; Hsairi and Ben Abdallah 2007)				
West Bank and Gaza	52.0% (UNAIDS 2007)	1.0% (UNAIDS 2007)	4.7% (UNAIDS 2007)	17.6% (UNAIDS 2007)	
Yemen, Republic of	77.3% (Lambert 2007)	16.0% (Lambert 2007)			6.8% (Lambert 2007)

of these countries, or HIV transmissions to their sexual partners upon their return. The weak surveillance systems of priority populations prevent us from definitively concluding whether this is indeed the dominant epidemiologic pattern in these countries. HIV could be still spreading among some of the priority groups, or within pockets of these populations, without awareness of this endemic spread. However, there is no evidence to date that such considerable endemic transmission exists in these countries.

Effective and repeated surveillance of priority populations (IDUs, MSM, and FSWs) is key for these countries to conclusively confirm that HIV spread is indeed limited in priority

populations. This could also facilitate the detection of emerging epidemics and would offer a window of opportunity for targeted prevention at an early phase of an epidemic. Pakistan is a relevant example; after nearly two decades of an epidemiologic pattern of exogenous HIV exposures, HIV found its way to priority populations and has spread rapidly among IDUs and, to some extent, MSM.⁴² Monitoring recent infections and examining the nature of exposures could also be useful in detecting emerging endemic transmission chains in these countries.

⁴² Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Rounds I, II, and III).

PARENTERAL HIV TRANSMISSIONS OTHER THAN INJECTING DRUG USE

Transmission of blood-borne pathogens occurs routinely in resource-limited settings and is considered a major public health problem in the developing world.⁴³ MENA is no exception to this rule, and there appears to be a lack of sufficient resources for screening blood and sterilizing medical equipment in several countries, including Afghanistan, Pakistan, Somalia, and the Republic of Yemen.⁴⁴ MENA as a whole suffers from high prevalence of unnecessary medical injections and transfusions, reuse of needles and syringes, needlestick injuries among health care workers (HCWs), and scarifications.⁴⁵ Public health systems are overstretched, leading to some careless attitudes toward safety measures.⁴⁶

Standard precautions are not routinely implemented in public health care, and even less so in private practices such as among dentists⁴⁷ and in hemodialysis centers.⁴⁸ Injections are the preferred mode of therapy even when alternative modes are equally effective,⁴⁹ and some health practitioners see this as an opportunity for charging additional fees.⁵⁰ Injections by non-medical providers are rampant,⁵¹ such as in Afghanistan, where they were reported by 38%

of the participants of a study.⁵² Financial limitations contribute to the reuse of syringes.⁵³

Blood transfusions are performed even when not medically indicated⁵⁴; a considerable share of the population reported such procedures. From 6.7% to 14.2% of diverse population groups in Sudan reported receiving a blood transfusion at least once in their lifetime.⁵⁵ Reuse of nonsterile blades and needles is not uncommon. Five percent of university students in Afghanistan used the nonsterile injecting needles of others and 20.8% used the nonsterile shaving sets of another person.⁵⁶ Thirty-one percent of university students and 19.4% of military personnel in Sudan used the nonsterile blades of others, and 4.8% and 8.6% used nonsterile needles with others, respectively.⁵⁷

Occupational injuries among HCWs are common, such as in Morocco where they were found to be at high frequency, although they were rarely declared.⁵⁸ Forty-nine percent of HCWs in Egypt,⁵⁹ 58.9% in Morocco,⁶⁰ and 45% in Pakistan⁶¹ reported a needlestick injury in the previous year.⁶² Percutaneous injuries among HCWs in MENA are caused by needle recapping, handling of trash bags or linens, collision with sharps, concealed sharps, restless patients, handling and passing of devices, and invasive interventions such as surgery.⁶³

The incidence of occupational exposures to infected blood and other fluids in the Islamic Republic of Iran, including exposures to fluids infected with HIV, hepatitis C virus (HCV), and hepatitis B virus (HBV), was documented at a rate of 53% exposures per person per year.⁶⁴ The

⁴³ Kane et al., "Transmission of Hepatitis"; Simonsen et al., "Unsafe Injections."

⁴⁴ Khawaja et al., "HIV/AIDS and Its Risk Factors in Pakistan"; World Bank Group, "World Bank Update 2005"; World Bank, *HIV/AIDS in Afghanistan*; WHO/EMRO, "Progress Report on HIV/AIDS and '3 by 5'"; UNAIDS, "Country Alignment and Harmonisation Support"; WHO/EMRO, *Progress towards Universal Access to HIV Prevention*; Luby et al., "Evaluation of Blood Bank Practices."

⁴⁵ Khawaja et al., "HIV/AIDS and Its Risk Factors in Pakistan"; World Bank Group, "World Bank Update 2005"; Yerly et al., "Nosocomial Outbreak"; Khattab et al., "Report on a Study of Women Living with HIV"; Burans et al., "Serosurvey of Prevalence"; Zafar et al., "Knowledge, Attitudes and Practices"; Hossini et al., "Knowledge and Attitudes"; Yemen MOH, *National Strategic Framework*; Kennedy, O'Reilly, and Mah, "The Use of a Quality-Improvement Approach."

⁴⁶ Zafar et al., "Knowledge, Attitudes and Practices."

⁴⁷ Askarian, Mirzaei, and McLaws, "Attitudes, Beliefs, and Infection Control"; Askarian, Mirzaei, and Cookson, "Knowledge, Attitudes, and Practice."

⁴⁸ Kabbash et al., "Risk Perception and Precautions."

⁴⁹ Janjua et al., "Population Beliefs"; Altaf et al., "Determinants of Therapeutic Injection Overuse."

⁵⁰ Janjua, Akhtar, and Hutin, "Injection Use."

⁵¹ Janjua, Akhtar, and Hutin, "Injection Use"; Janjua, "Injection Practices."

⁵² Todd et al., "Prevalence of Human Immunodeficiency Virus Infection."

⁵³ Janjua, "Injection Practices."

⁵⁴ Abdul Mujeeb, "Blood Transfusion."

⁵⁵ Ahmed, *Sex Sellers*; Ahmed, *Antenatal*; Ahmed, *Tea Sellers*; Ahmed, *Military*; Ahmed, *Truck Drivers*; Ahmed, *University Students*; Ahmed, *TB Patients*; Ahmed, *Internally Displaced People*; Ahmed, *Street Children*.

⁵⁶ Mansoor et al., "Gender Differences in KAP."

⁵⁷ Sudan National HIV/AIDS Control Program, *HIV/AIDS/STIs Prevalence*; Ahmed, *STDs*; Ahmed, *AIDS Patients*.

⁵⁸ Hossini et al., "Knowledge and Attitudes"; Laraqui et al., "Assessing Knowledge, Attitude, and Practice."

⁵⁹ Kabbash et al., "Risk Perception and Precautions."

⁶⁰ Laraqui et al., "Assessing Knowledge."

⁶¹ Zafar et al., "Knowledge, Attitudes and Practices."

⁶² Ibid.

⁶³ Kuruuzum et al., "Risk of Infection"; Jahan, "Epidemiology of Needlestick Injuries."

⁶⁴ Hadadi et al., "Occupational Exposure."

incidence of needlestick injuries in Saudi Arabia was estimated at 11% per nurse per year and 6% per doctor per year.⁶⁵ There is not sufficient knowledge of risks of needlestick injuries even among HCWs.⁶⁶ Despite what appeared to be good knowledge, the performance of HCWs for universal blood precautions in public hemodialysis units in Egypt was poor, and performance was worse in private units.⁶⁷

At 4.3 per year, MENA has the highest rate of injections per person per year of all regions.⁶⁸ In Egypt, 26.8% of women in the 2005 Demographic and Health Survey reported receiving an injection in the last six months, with an average number of two injections.⁶⁹ MENA also has the highest levels of all regions of incidences of HBV (58.3%) and HCV infections (81.7%) attributable to contaminated injections.⁷⁰ It is estimated that 7.2% of HIV infections in the region are due to contaminated injections.⁷¹ Every year in MENA, contaminated injections appear to be the cause of 2.5 million HBV infections, 645,000 HCV infections, and 2,200 HIV infections.⁷² Reuse of needles and syringes; major and minor surgery; hospitalization; a history of invasive procedures; a history of dental procedures; high levels of injections; medical abortion; and formal and informal health care were repeatedly linked to HCV infection in MENA.⁷³

Egypt has witnessed the world's largest iatrogenic transmission of blood-borne pathogens during the era of parenteral antischistosomal therapy.⁷⁴ This led to a massive increase in HCV and HBV infections in the general population, and today Egypt has the world's highest HCV prevalence.⁷⁵ The largest documented nosocomial (contracted as a result of being hospitalized)

outbreak in HIV/AIDS history occurred in a children's hospital in Libya and involved 402 children, 19 mothers (through breastfeeding), and two nurses.⁷⁶ The first documented HIV outbreak in renal dialysis centers in the history of the HIV epidemic occurred in Egypt,⁷⁷ which had a second HIV outbreak in renal dialysis centers as well.⁷⁸ HCV incidence among hemodialysis patients in Morocco was very high at 9.41% per person per year,⁷⁹ and moderately high in the Islamic Republic of Iran at 1.8% per person per year,⁸⁰ suggesting elevated levels of nosocomial transmissions. Incidence of blood-borne diseases was found to be common in dialysis centers in Jordan.⁸¹

There is at least one documented HIV infection in MENA that resulted from *hijamah* (traditional medicine practice of phlebotomy by applying glass cupping and skin scarification).⁸² A history of *hijamah* has been associated with HCV infection in two Iranian studies.⁸³

Parenteral transmission of HIV has been documented in several MENA countries and HIV prevalence has been measured among a number of populations at risk of parenteral HIV infection. Table 7.2 lists these HIV prevalence measurements. The sizable prevalence in these studies reflects infections that occurred mostly before improvements in safety precautions were implemented. Meanwhile, the nil prevalence mainly reflects point-prevalence surveys after safety precautions were implemented.

The above factors pose a concern as to whether there is substantial parenteral HIV transmission in MENA beyond IDU, and whether such transmission accounts for some of the HIV infections where apparently there are no identifiable risk behaviors. To address this question, and given the limitations on HIV data, the authors conducted a review of HCV prevalence in MENA.

⁶⁵ Jahan, "Epidemiology of Needlestick Injuries."

⁶⁶ Moghimi et al., "Knowledge, Attitude, and Practice."

⁶⁷ Kabbash et al., "Risk Perception and Precautions."

⁶⁸ Hauri, Armstrong, and Hutin, "The Global Burden of Disease."

⁶⁹ Measure DHS, "Egypt: Demographic and Health Survey 2005."

⁷⁰ Hauri, Armstrong, and Hutin, "The Global Burden of Disease."

⁷¹ Ibid.

⁷² Ibid.

⁷³ Barut et al., "Analysis of Risk Factors"; Idrees and Riazuddin, "Frequency Distribution"; Stoszek et al., "Prevalence of and Risk Factors"; Khan et al., "Prevalence of Hepatitis 'B' and 'C'"; Gulcan et al., "Evaluation of Risk Factors"; Abbas et al., "Prevalence and Mode of Spread"; Younus, Siddiqi, and Akhtar, "Reassessment of Selected Healthcare"; Ben Alaya Bouafif et al., "A Case Control Study."

⁷⁴ Frank et al., "The Role of Parenteral Antischistosomal Therapy."

⁷⁵ Waked et al., "High Prevalence of Hepatitis C."

⁷⁶ Yerly et al., "Nosocomial Outbreak"; Visco-Comandini et al., "Monophyletic HIV Type 1"; de Oliveira et al., "Molecular Epidemiology."

⁷⁷ Hassan et al., "HIV Infection."

⁷⁸ El Sayed et al., "Epidemic Transmission."

⁷⁹ Sekkat et al., "Prevalence of Anti-HCV Antibodies."

⁸⁰ Nemati et al., "Hepatitis C Virus Infection."

⁸¹ Al Hijazat and Ajlouni, "Hepatitis B Infection."

⁸² Alrajhi, Halim, and Al-Abdely, "Mode of Transmission."

⁸³ Zali et al., "Anti-HCV Antibody"; Hosseini Asl, Avijgan, and Mohamadnejad, "High Prevalence."

Table 7.2 HIV Prevalence among Populations at Risk of Parenteral HIV Infection (excluding IDUs)

Country	HIV prevalence among populations at risk of parenteral HIV infection
Bahrain	1.6% (children with hereditary hemolytic anemias; Al-Mahroos and Ebrahim 1995)
Egypt, Arab Republic of	4.8% (blood or blood products recipients; Watts et al. 1993)
Iran, Islamic Republic of	0.0% (thalassemia patients; Mirmomen et al. 2006) 0.0% (thalassemia patients; Ansar and Kooloobandi 2002) 0.0% (thalassemia patients; Alavian, Gholami, and Masarrat 2002) 0.0% (thalassemia patients; Javadzadeh, Attar, and Taher Yavari 2006) 0.0% (thalassemia patients; Khamispor and Tahmasebi 1999) 0.0% (thalassemia patients; Basiratnia, HosseiniAsl, and Avijegan 1999) 0.0% (thalassemia patients; Kadivar et al., 2001) 0.0% (thalassemia patients; Nakhaie and Talachian 2003) 0.0% (thalassemia patients; Rezvan, Abolghassemi, and Kafiabad 2007) 0.0% (thalassemia patients; Marcelin et al. 2001) 0.0% (multitransfused thalassaemic children; Karimi and Ghavanini 2001b) 0.71% (multitransfused patients with hemophilia; Karimi and Ghavanini 2001a) 2.3% (hemophiliacs; Alavian, Ardeshiri, and Hajarizadeh 2001) 0.0% (hemophiliacs; Karimi, Yarmohammadi, and Ardeshiri 2002) 0.9% (hemophiliacs; Torabi et al. 2006) 1.4% (hemophiliacs; Javadzadeh, Attar, and Taher Yavari 2006) 0.0% (hemophiliacs; Mansour-Ghanaei et al. 2002) 0.0% (hemophiliacs; Khamispor and Tahmasebi 1999)
Jordan	0.0% (multitransfused patients; Al-Sheyyab, Batieha, and El-Khateeb 2001)
Lebanon	6.0% (multitransfused patients; Mokhbat et al. 1989)
Morocco	0.0% (hemodialysis patients; Boulaajaj et al. 2005)
Pakistan	0.98% (multitransfused patients; Mujeeb and Hafeez 1993; hemodialysis patients; Khamispor and Tahmasebi 1999)
Qatar	38.5% (children with thalassemia; Novelli et al. 1987)
Saudi Arabia	1.3% (multitransfused thalassaemic and sickle cell disease patients; El-Hazmi and Ramia 1989) 0.0% (children undergoing cancer therapy; Bakir et al. 1995)
Tunisia	0.0% (hemodialysis patients; Hmida et al. 1995) 8.6% (hemophiliacs; Langar et al. 2005)

HCV is a major cause of chronic liver disease and hepatocellular carcinoma.⁸⁴ HCV prevalence is a powerful proxy of the potential spread of HIV through the parenteral transmission modes in different populations,⁸⁵ and HCV is the most prevalent transfusion-transmitted infection.⁸⁶ It is also a better proxy of parenteral transmissions than HBV, which has other major nonparenteral trans-

mission modes.⁸⁷ Table D.4 (appendix D) summarizes the review of HCV prevalence. Although overall the region has the second highest HCV prevalence after sub-Saharan Africa,⁸⁸ this is largely due to the contribution of the high prevalence found in Egypt⁸⁹ and Pakistan.⁹⁰ For the rest of the countries, intermediate prevalence levels are found in the general population. These levels are not

⁸⁴ Colombo, Rumi, and Ninno, "Treatment of Chronic Hepatitis C in Europe."

⁸⁵ Goldmann, "Blood-Borne Pathogens and Nosocomial Infections"; Walker et al., "Epidemiology: Sexual Transmission of HIV in Africa"; Schmid et al., "Transmission of HIV-1."

⁸⁶ Rezvan, Abolghassemi, and Kafiabad, "Transfusion-Transmitted Infections."

⁸⁷ Maayan et al., "Exposure to Hepatitis."

⁸⁸ WHO, *Global Surveillance and Control of Hepatitis C*; WHO, *Weekly Epidemiological Record*.

⁸⁹ Frank et al., "The Role of Parenteral Antischistosomal Therapy."

⁹⁰ Raja and Janjua, "Epidemiology of Hepatitis C Virus Infection in Pakistan"; Khokhar, Gill, and Malik, "General Seroprevalence of Hepatitis C"; Aslam et al., "Association between Smallpox Vaccination and Hepatitis C."

dissimilar to those found in the Americas, Asia, and Europe.⁹¹

Table D.4 suggests the following regarding the parenteral transmission of blood-borne pathogens in MENA:

1. There is ongoing transmission of HCV in the general population, largely at intermediate levels.
2. There are specific population groups that are at high risk of infection, such as hemodialysis patients, multitransfused patients, and household contacts of HCV-infected patients.⁹²
3. There is ongoing blood-borne transmission in health facilities as evidenced by the higher prevalence of HCV among HCWs and hospitalized patients.
4. HCV prevalence is high among prisoners, suggesting that IDU and the use of nonsterile injecting and noninjecting utensils are common in prisons.
5. There is not sufficient awareness about the dangers of reusing the nonsterile injection equipment of others, as suggested by the higher prevalence among diabetes patients, who likely use self-administered or relative-administered injections.
6. Persons in certain professional categories might be at higher risk of becoming infected, or transmitting the infection, due to exposures to bodily fluids, such as barbers, who appear to have about a fivefold higher HCV prevalence than the general population (5% in Morocco⁹³ and 2.8% in Turkey⁹⁴). HCV infection at barber shops has also been suggested in Pakistan.⁹⁵ Studies of traditional barbers in Morocco and Pakistan have shown that the risk of blood-borne infectious diseases was not known to barbers nor to their customers and that the hygiene conditions were

deficient.⁹⁶ This is also of concern because there is a tradition in MENA of barbers practicing medicine.⁹⁷

HCV prevalence is a proxy for the cumulative risk of parenteral transmission over an extended period of time and may not be representative of recent trends. It is plausible that more stringent safety precautions have been implemented recently. Improvements in blood safety measures have reduced HIV infections due to contaminated blood in MENA from 12.1% in 1993 to 0.4% in 2003.⁹⁸ In Lebanon and the West Bank and Gaza, no new HIV cases through blood transfusion have been detected for several years.⁹⁹ In the Islamic Republic of Iran, HCV prevalence among thalassemia patients decreased from 22.8% to 2.6% following the implementation of blood donor screening.¹⁰⁰ Also in the Islamic Republic of Iran, HCV prevalence among hemodialysis patients decreased from 18% in 2001 to 12% in 2006 in one study,¹⁰¹ and from 14.4% in 1999 to 4.5% in 2006 in another study.¹⁰² Similar reductions were also achieved for HBV in both the Islamic Republic of Iran and Turkey.¹⁰³ In Egypt, 95% of women in the 2005 Demographic and Health Survey reported that the medical provider followed basic injection safety procedures.¹⁰⁴

Nevertheless, improvements in safety measures may not have been uniform across MENA. A study in Pakistan observed an increase in HCV prevalence in recent years.¹⁰⁵ There is evidence of ongoing HCV incidence at the household and population levels in Egypt,¹⁰⁶ and intrafamilial and household clustering of HCV infection in Pakistan.¹⁰⁷

⁹¹ Sy and Jamal, "Epidemiology of Hepatitis C Virus (HCV) Infection."

⁹² Ali et al., "Hepatitis B and Hepatitis C in Pakistan."

⁹³ Zahraoui-Mehadji et al., "Infectious Risks."

⁹⁴ Candan et al., "Prevalence of Hepatitis."

⁹⁵ Raja and Janjua, "Epidemiology of Hepatitis C Virus Infection in Pakistan"; Ali et al., "Hepatitis B and Hepatitis C in Pakistan"; Khattak et al. "Factors Influencing Hepatitis C."

⁹⁶ Zahraoui-Mehadji et al., "Infectious Risks"; Janjua and Nizamy, "Knowledge and Practices of Barbers."

⁹⁷ Zahraoui-Mehadji et al., "Infectious Risks."

⁹⁸ UNAIDS, "Notes on AIDS in the Middle East and North Africa."

⁹⁹ UNAIDS, "Key Findings"; Jurjus et al., "Knowledge, Attitudes, Beliefs, and Practices."

¹⁰⁰ Mirmomen et al., "Epidemiology of Hepatitis."

¹⁰¹ Taziki and Espahbodi, "Prevalence of Hepatitis."

¹⁰² Alavian et al., "Hepatitis B and C."

¹⁰³ Rezvan, Abolghassemi, and Kafiabad, "Transfusion-Transmitted Infections"; Alavian et al., "Hepatitis B and C"; Kocak et al., "Trends in Major Transfusion-Transmissible Infections."

¹⁰⁴ Measure DHS, "Egypt: Demographic and Health Survey 2005."

¹⁰⁵ Mujeeb and Pearce, "Temporal Trends in Hepatitis B and C."

¹⁰⁶ Mujeeb and Pearce, "Temporal Trends in Hepatitis B and C"; Saleh et al., "Incidence and Risk Factors"; Mohamed et al., "Transmission of Hepatitis C Virus between Parents and Children"; Magder et al., "Estimation of the Risk of Transmission."

¹⁰⁷ Abbas et al., "Prevalence and Mode of Spread of Hepatitis."

Analytical summary

There have been steady improvements in recent years in MENA in safety measures related to HIV parenteral transmission modes, but a few countries are still lagging in achieving acceptable standards. In line with this progress, HIV parenteral transmissions, other than IDU, have been in decline in most MENA countries and have reached very low levels. Despite this progress, isolated HIV outbreaks, particularly in health care facilities, could still occur as they have in the past.

Some HIV infectious spread may be present along the same pathways that HCV is using to spread in MENA. The parenteral transmission modes other than IDU, however, are unlikely to be large enough to sustain an HIV epidemic considering that HIV transmission probability per exposure is much lower than that of HCV.¹⁰⁸ Despite the presence of exposures to blood and bodily fluids, the low endemicity of HIV, as well as HCV and HBV, in most of the region limits the infection risk to these pathogens.¹⁰⁹ Earlier speculation that the sub-Saharan Africa HIV epidemic was driven by unsafe injections¹¹⁰ proved to be incorrect.¹¹¹ Yet, more precautions, including educational programs,¹¹² need to be implemented to avoid the unnecessary spread of HIV and other blood-borne pathogens along the parenteral transmission modes.

HIV MOLECULAR EPIDEMIOLOGY

Molecular epidemiology research in MENA is still limited, though such research could be valuable in tracking the evolution of the epidemic among different risk groups, understanding sexual and injecting risk networks of priority groups, and identifying transmission pathways among the populations of the region.¹¹³ Several studies in MENA have examined the nature of HIV subtypes present in the region and have

suggested the transmission pathways in the population.

In Algeria, despite substantial HIV subtype diversity,¹¹⁴ subtype B was found to be the dominant strain, particularly in the north of the country, accounting for 56% of the samples studied.¹¹⁵ There is, however, a high diversity in the recombinant subtypes in the southern part of Algeria bordering sub-Saharan Africa, with origins found in the vicinity of Algeria, such as in Niger.¹¹⁶

In Djibouti, an analysis of 34 isolates found that 73% were of subtype C, 18% of recombinant forms including CRF02_AG, 6% of subtype D, and 3% of subtype A.¹¹⁷ Another study in Djibouti found subtype C to be the most prevalent, with the presence of subtypes A and D along with recombinant types.¹¹⁸ Among French military personnel who served in Djibouti, mostly subtype C infections were found, though subtypes A and B were also found.¹¹⁹

An analysis of viral sequences among IDUs in the Islamic Republic of Iran found confined variability, suggesting the epidemic in the Islamic Republic of Iran is recent.¹²⁰ The viral sequences were found to be strongly related and formed a single cluster within subtype A, related, though not necessarily directly, to Ugandan and Kenyan isolates.¹²¹ Interestingly, there was a lack of strong phylogenetic correlation between the sequences from the Islamic Republic of Iran and other Middle Eastern countries.¹²² The virus may have been introduced to Iranian IDUs by a pilgrim visiting Mashhad, the Islamic Republic of Iran's holiest city.¹²³ Meanwhile, the analyses indicated that all hemophiliacs infected with HIV in the Islamic Republic of Iran are infected with HIV subtype B.¹²⁴ This suggests that there have been two parallel epidemics in

¹⁰⁸ Goldmann, "Blood-Borne Pathogens and Nosocomial Infections"; Gerberding, "Management of Occupational Exposures to Blood-Borne Viruses."

¹⁰⁹ Kuruuzum et al., "Risk of Infection."

¹¹⁰ Gisselquist et al., "Let It Be Sexual"; Gisselquist et al., "HIV Infections."

¹¹¹ Schmid et al., "Transmission of HIV-1."

¹¹² Mishal et al., "Risk of Transmission."

¹¹³ Sanders-Buell et al., "A Nascent HIV Type 1 Epidemic"; Piyasirisilp et al., "A Recent Outbreak"; McCutchan et al., "HIV-1 and Drug Trafficking."

¹¹⁴ Bouzeghoub et al., "First Observation."

¹¹⁵ Bouzeghoub et al., "High Diversity of HIV Type 1 in Algeria."

¹¹⁶ *Ibid.*

¹¹⁷ Maslin et al., "Epidemiology and Genetic Characterization."

¹¹⁸ *Ibid.*

¹¹⁹ Lasky et al., "Presence of Multiple Non-B Subtypes."

¹²⁰ Tagliamonte et al., "HIV Type 1 Subtype A"; Naderi et al., "Molecular and Phylogenetic Analysis."

¹²¹ Tagliamonte et al., "HIV Type 1 Subtype A."

¹²² Tagliamonte et al., "HIV Type 1 Subtype A"; Naderi et al., "Molecular and Phylogenetic Analysis."

¹²³ Tagliamonte et al., "HIV Type 1 Subtype A."

¹²⁴ Sarrami-Forooshani et al., "Molecular Analysis."

different risk populations in the Islamic Republic of Iran. The HIV epidemic among IDUs in Kabul, Afghanistan, has also been linked through sequence analyses to the Iranian epidemic.¹²⁵ One other study from the Islamic Republic of Iran supports a close link between the virus subtypes circulating in the Islamic Republic of Iran and Afghanistan.¹²⁶

In Lebanon, a complex HIV subtype distribution pattern was found representing the infection's travel history from its point of origination.¹²⁷ Even within a single subtype, high levels of genetic intrasubtype diversity were found, suggesting multiple introductions of the virus to Lebanon.¹²⁸

A study of a nosocomial HIV outbreak in a children's hospital in Libya linked the virus to a strain originating in West Africa.¹²⁹ In Morocco, 93.5% of HIV infections were found to be of subtype B.¹³⁰ More recent data, however, suggest an increasing diversity of subtypes, with 34% of the cases carrying nonsubtype B viruses.¹³¹ In the West Bank and Gaza, subtype B was also dominant and the phylogenetic tree analyses indicated multiple introductions of HIV into the population.¹³² Subtype A was the only subtype observed among a group of IDUs in Pakistan.¹³³

In Saudi Arabia, high strain diversity suggesting multiple introductions was found, with subtypes C, G, B, D, and A accounting for 39.3%, 25%, 17.9%, 3.6%, and 1.8% of the infections, respectively.¹³⁴ Two kinds of sequences (CRF25_cpx and CRF43_02G) were found to form distinct subclusters, suggesting a transmission network within Saudi Arabia.¹³⁵

In Sudan, 50% of the strains from blood donors in Khartoum were of subtype D and 30% of subtype C, with limited frequencies of subtypes A, B, and recombinant forms.¹³⁶ Some of the D subtype strains clustered with those in

East Africa, while others clustered with those in West Africa. The majority of strains were similar to those in Uganda, Kenya, and Ethiopia.

In Tunisia, subtype B was by far the dominant subtype.¹³⁷ In a study of 19 strains in the Republic of Yemen, 47.3% were of subtype B, 31.6% of subtype C, 10.5% of subtype D, 5.3% of subtype A, and 5.3% were recombinant forms.¹³⁸ Of the two subtype D strains, one clustered with strains from Uganda and the other with strains from Cameroon. The one subtype A strain was similar to a Cameroon variant. Overall, the strains found in the study suggest multiple introductions of HIV to the Republic of Yemen from East and West Africa, Europe, and India.

Analytical summary

It is difficult to draw firm conclusions from just a few studies, including a small number of HIV isolates that may be reflecting transmission patterns from the past. More often than not though, sequence analyses indicate multiple distinct subtypes in the isolated strains.¹³⁹ This suggests multiple introductions rather than endemic existence of genetically diverse HIV subtypes in a number of MENA countries. The diversity found in Algeria, Lebanon, Saudi Arabia, the West Bank and Gaza, and the Republic of Yemen may suggest that HIV dynamics are mainly driven by exogenous exposures, generally among the nationals of these countries while abroad, or HIV transmissions to their sexual partners upon their return. Most endogenous HIV infections could be direct transmissions from index cases following multiple introductions. HIV dynamics are not dominated by a specific epidemic in one or multiple risk groups.

On the other hand, the dominance of specific subtypes with limited sequence variability in Djibouti, the Islamic Republic of Iran, and Sudan, in addition to possibly two subclusters in Saudi Arabia, suggests that HIV infections are occurring in transmission chains that have been propagating locally for at least several years. This suggests a local epidemic-type HIV transmission in one or multiple risk groups.

¹²⁵ Sanders-Buell et al., "A Nascent HIV Type 1 Epidemic."

¹²⁶ Soheilli et al., "Presence of HIV-1 CRF35_AD in Iran."

¹²⁷ Pieniazek et al., "Introduction of HIV-2."

¹²⁸ *Ibid.*

¹²⁹ de Oliveira et al., "Molecular Epidemiology."

¹³⁰ Elharti et al., "HIV-1 Diversity in Morocco."

¹³¹ Morocco MOH, "Situation épidémiologique."

¹³² Gehring et al., "Molecular Epidemiology of HIV in Israel."

¹³³ Khan et al., "HIV-1 Subtype A."

¹³⁴ Badreddine et al., "Identification and Characterization of HIV Type 1."

¹³⁵ Yamaguchi et al., "Identification of New CRF43_02G and CRF25_cpx."

¹³⁶ Hierholzer et al., "HIV Type 1 Strains."

¹³⁷ Ben Halima et al., "First Molecular Characterization."

¹³⁸ Saad et al., "HIV Type 1 Strains."

¹³⁹ Earhart, "The Molecular Epidemiology of HIV-1 in Central Asia."

Needless to say, the above data show that HIV has no borders and is entering the region from multiple sources through nationals of MENA countries.

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Condom Knowledge and Use and HIV/AIDS Knowledge and Attitudes

This chapter discusses condom knowledge and its use in the Middle East and North Africa (MENA) populations, and then delineates the characteristics of HIV/AIDS (human immunodeficiency virus/acquired immune deficiency syndrome) knowledge and attitudes in this region.

KNOWLEDGE OF CONDOM AS A PREVENTION METHOD AND ITS USE

Levels of general condom knowledge, levels of condom knowledge as a means of HIV prevention, and levels of condom use have been documented in different populations in multiple studies in MENA. Tables 8.1 and 8.2 summarize these levels for a number of MENA countries. Condom knowledge varies substantially within MENA, and it is rather low in resource-limited settings.

Condom knowledge does not necessarily mean condom knowledge as *a means of HIV prevention*. Parts of the populations have heard of condoms as a birth control method, but are not aware of its use for HIV prevention. Among rural populations in Sudan, 31.6% had heard of condoms, but only 4% identified them as a means of HIV prevention.¹ Avoidance of nonsanctioned sex is often cited as a means of HIV prevention rather than safe sex. Only 0.4% of tourism and industrial workers in the Arab Republic of Egypt reported knowing condoms can be used for HIV prevention.²

Condom knowledge as a means of HIV prevention does not necessarily relate to actual condom use. Only a fraction of those who are aware of the efficacy of condoms against HIV actually use condoms,³ and they may do so out of pregnancy concerns rather than for HIV prevention.⁴ Of those who use condoms, only a small minority use them consistently. In a nutshell, consistent condom use for HIV prevention is limited in MENA and the majority of at-risk sexual acts are not protected against HIV infection. Condom use is low even among the priority populations (table 8.2).

Repeatedly, pharmacies are cited as the most accessible source for condoms.⁵ Several priority populations have reported limitations in condom accessibility and difficulty in using them, such as in Egypt, where 44% of female sex workers (FSWs) and 22% of men who have sex with men (MSM) had trouble obtaining condoms, and 89% of FSWs and 38% of MSM had trouble using them.⁶ The most cited reasons for not using condoms are high condom prices,⁷

³ Hajiabdolbaghi et al., "Insights from a Survey"; Ministry of Health and Medical Education of Iran, *AIDS/HIV Surveillance Report*, Syria MOH, *HIV/AIDS Female Sex Workers*.

⁴ Faisal and Cleland, "Study of the Sexual Behaviours."

⁵ Mohammad et al., "Sexual Risk-Taking Behaviors"; Hermez et al., "HIV/AIDS Prevention"; Jurjus et al., "Knowledge, Attitudes, Beliefs, and Practices."

⁶ El-Sayed et al., "Evaluation of Selected Reproductive Health Infections."

⁷ Tehrani and Malek-Afzalip, "Knowledge, Attitudes and Practices"; Ministry of Health and Medical Education of Iran, *AIDS/HIV Surveillance Report*.

¹ SNAP, UNICEF, and UNAIDS, "Baseline Study on Knowledge."

² El-Sayyed, Kabbash, and El-Gueniedy, "Knowledge, Attitude and Practices."

Table 8.1 General Knowledge of Condoms including HIV Prevention, in Different Populations Groups in MENA

Country	Knowledge of condoms	Knowledge of condom use for HIV prevention
Afghanistan	25.0% (TB patients; Todd et al. 2007) 41.0% (FSWs; World Bank 2008)	
Egypt, Arab Republic of	10.0% (adolescents; El-Tawila et al. 1999)	60.0% (general population; Kabbash et al. 2007) 49.3% (MSM; El-Sayyed, Kabbash, and El-Gueniedy 2008)
Iran, Islamic Republic of	Majority (adolescents; Mohammadi et al. 2006)	Majority (adolescents; Mohammadi et al. 2006) 53.0% (adolescents; Yazdi et al. 2006) 42.0% (adolescents; prevent STIs; Mohammadi et al. 2006) 49.0% (university students; Simbar, Tehrani, and Hashemi 2005) 62.0% (male university students; Simbar, Tehrani, and Hashemi 2005) 39.0% (female university students; Simbar, Tehrani, and Hashemi 2005) 10.0% (prisoners; Khawaja et al. 1997) Nearly all (FSWs; Ministry of Health and Medical Education of Iran 2004)
Jordan	84.4% (general population women; Measure DHS 1998)	33.0% (general population women; Measure DHS 2003)
Lebanon	84.1% (general population; Jurjus et al. 2004)	
Morocco	37.5% (general population women; Morocco MOH 2004) 53.8% (youth; Morocco MOH, with GTZ, 2007) 73.4% (FSWs; Morocco MOH 2007)	37.5% (general population women; Zidouh [unknown]) 53% (youth; Morocco MOH, with GTZ, 2007) 53% (FSWs; Morocco MOH 2007)
Pakistan	94.0% <i>hijras</i> (Khan et al. 2008)	58.7% (obstetrics and gynecology clinic attendees; Haider et al. 2009) 19.5% (ever-married women; Measure DHS 2007) Minority (truck drivers; Agha 2000) 37%–77% (FSWs; Bokhari et al. 2007) 60.4% (FSWs; Pakistan National AIDS Control Program 2005) 64.0% (FSWs; Pakistan National AIDS Control Program 2006–07) 46.6% (IDUs; Pakistan National AIDS Control Program 2005) 44.3% (IDUs; Pakistan National AIDS Control Program 2006–07) 44.0% (IDUs; Pakistan National AIDS Control Program 2008) 63.7% (MSWs; Pakistan National AIDS Control Program 2005) 54.0% (MSWs; Pakistan National AIDS Control Program 2006–07) 61.7% (MSWs; Pakistan National AIDS Control Program 2008) 57.0% (HSWs; Pakistan National AIDS Control Program 2005) 50.2% (HSWs; Pakistan National AIDS Control Program 2006–07) 66.5% (HSWs; Pakistan National AIDS Control Program 2008) 69.0% <i>hijras</i> (Khan et al. 2008)
Somalia	23.0% (women under age 24; Population Studies Research Institute 2000)	
Sudan	71.9% (university students; Sudan National HIV/AIDS Control Program 2004) One-third (general population; Ahmed 2004b) 21.1% (general population; Southern Sudan; NSNAC and UNAIDS 2006) 89.0% (general population; men; Southern Sudan; UNHCR 2007) 71.0% (general population; women; Southern Sudan; UNHCR 2007) 31.6% (rural populations; SNAP, UNICEF, and UNAIDS 2005) 72.1% (truck drivers; Farah and Hussein 2006) 63.9% (prisoners; Assal 2006) 65.2% (military personnel; Sudan National HIV/AIDS Control Program 2004) 45.0% (FSWs; Sudan National HIV/AIDS Control Program 2004) 60.9% (FSWs; Yousif 2006) 17.2% (FSWs; ACORD 2006) 28.0% (FSWs; Ati 2005)	18.5% (street children; Ahmed 2004h) 27.4% (university students; Ahmed 2004i) 4.0% (rural populations; SNAP, UNICEF, and UNAIDS 2005) 5.2% (ANC women attendees; Ahmed 2004b) 10.2% (general population; Southern Sudan; NSNAC and UNAIDS 2006) 78.0% (general population; men; Southern Sudan; UNHCR 2007) 58.0% (general population; women; Southern Sudan; UNHCR 2007) 5.0% (tea sellers; Ahmed 2004j) 11.3% (internally displaced persons; Ahmed 2004c) 2.0% (police officers; Abdelwahab 2006) 5.7% (military personnel; Ahmed 2004d) 9.1% (prisoners; Ahmed 2004e) 7.5% (truck drivers; Ahmed 2004k) 12.8% (TB patients; Ahmed 2004i) 8.5% (STD clinic attendees; Ahmed 2004g) 4.3% (suspected AIDS patients; Ahmed 2004a) 5.3% (truck drivers; Farah and Hussein 2006) 17.0% (FSWs; Sudan National HIV/AIDS Control Program 2004) 17.3% (FSWs; Ahmed 2004f)

Table 8.1 (Continued)

Country	Knowledge of condoms	Knowledge of condom use for HIV prevention
	45.0% (FSWs; Sudan National HIV/AIDS Control Program 2004) 45.1% (FSWs; Anonymous 2007)	
Syrian Arab Republic		38.0% (IDUs; Syria Mental Health Directorate 2008)
Tunisia	89.2% (MSM; Hsairi and Ben Abdallah 2007)	
West Bank and Gaza		67.0% (youth; PFPPA 2005)
Yemen, Republic of	48.3% (general population, marginalized minority, and returnees from extended work abroad; Busulwa 2003)	28.5% (youth; Al-Serouri 2005) 49.4% (high school students; Raja and Farhan 2005) 51.9% (high school students; Gharamah and Baktayan 2006) 20.7% (general population, marginalized minority, and returnees from extended work abroad; Busulwa 2003)

Note: ANC = antenatal clinic; HSW = *hijra* sex worker; IDU = injecting drug user; STD = sexually transmitted disease; TB = tuberculosis.

Table 8.2 Condom Use among Different Population Groups in MENA

Country	Condom use
Afghanistan	0.0% (ever use; IDUs; Sanders-Buell et al. 2007) 17.0% (ever use; commercial sex; IDUs; World Bank 2008) 36.0% (ever use; FSWs; World Bank 2008)
Djibouti	48.4% (ever use; sexually active high school students; Rodier et al. 1993) 24.2% (always; sexually active high school students; Rodier et al. 1993) Rare (STD clinic attendees; Wassef et al. 1989) Not common (unlicensed FSWs; Wassef et al. 1989) Common (bar hostesses; Wassef et al. 1989)
Egypt, Arab Republic of	90.0% (casual sex; tourism workers; El-Sayed et al. 1996) 23.9% (contraceptive method; general population; Kabbash et al. 2007) Low (regular use; university students; Refaat 2004) 34.1% (ever use; regular partners; IDUs; Egypt MOH and Population National AIDS Program 2006) 12.8% (ever use; nonregular noncommercial partners; IDUs; Egypt MOH and Population National AIDS Program 2006) 11.8% (ever use; with CSWs; IDUs; Egypt MOH and Population National AIDS Program 2006) 66.0% (ever use; IDUs; Elshimi, Warner-Smith, and Aon 2004) 20.0% (ever use; IDUs; El-Sayed et al. 2002) 9.0% (always; IDUs; El-Sayed et al. 2002) 44.0% (ever use; FSWs; El-Sayed et al. 2002) 6.8% (last sex act with a noncommercial partner; FSWs; Egypt MOH and Population National AIDS Program 2006) 6.0% (always; FSWs; El-Sayed et al. 2002) 56.0% (ever use; FSWs; El-Sayed et al. 2002) 6.8% (last sex; noncommercial partners; IDUs; Egypt MOH and Population National AIDS Program 2006) 47.0% (ever use; MSM; El-Sayed et al. 2002) 19.0% (regularly; MSM; El-Rahman 2004) 2.0% (consistent; MSM; El-Sayed 1994) 19.0% (consistent; MSM; El-Sayed et al. 2002) 19.2% (consistent; MSM; El-Sayyed, Kabbash, and El-Gueniedy 2008) 9.2% (last commercial sex; MSM; Egypt MOH and Population National AIDS Program 2006) 12.7% (last noncommercial sex; MSM; Egypt MOH and Population National AIDS Program 2006) 21.0% (ever use; MSM; El-Sayed 1994) 47.9% (ever use; MSM; El-Sayyed, Kabbash, and El-Gueniedy 2008)

(continued)

Table 8.2 (Continued)

Country	Condom use
Iran, Islamic Republic of	71.7% (ever use; youth; Mohammad et al. 2007) 48.0% (ever use; university students; Simbar, Tehrani, and Hashemi 2005) 64.8% (ever use; truck drivers; Tehrani and Malek-Afzalip 2008) 89.0% (recent use; clients of FSWs; Zargooshi 2002) 53.0% (ever use; IDUs; Zamani et al. 2005) 52.0% (ever use; IDUs; Narenjiha et al. 2005) 37.0% (last sex; IDUs; Zamani et al. 2005) 11.3%–12.4% (ever use; IDU prisoners; Farhoudi et al. 2003) 52.0% (ever use; FSWs; Tehrani and Malek-Afzalip 2008) 50.0% (ever use; FSWs; Ministry of Health and Medical Education of Iran 2004) 24%–83.2% (last client; FSWs; Jahani et al. 2005; Ardalan et al. 2002) 19.4% (last anal sex; steady partners; MSM; Eftekhar et al. 2008) 59.5% (last anal sex; commercial sex partners; MSM; Eftekhar et al. 2008) 59.9% (last anal sex; casual partners; MSM; Eftekhar et al. 2008)
Jordan	Moderately high (nonmarital sex; youth; UNAIDS and WHO 2005) 4.0% (last sex; general population women; Measure DHS 2003)
Kuwait	1.5% (recent use; STD clinic attendees; Al-Mutairi et al. 2007)
Lebanon	7.0% (current use; married women; Kulczycki 2004) 24.0% (current use; married women; Kulczycki 2004) 32.0% (ever use; general population; Lebanon National AIDS Control Program 1996) 25.0% (last sex regular partnerships; general population; Jurjus et al. 2004) 71.7% (last sex nonregular partnerships; general population; Jurjus et al. 2004) 15.3% (ever use; general population; Jurjus et al. 2004) 23.4% (last sex while drunk; prisoners; Mishwar 2008) 88.0% (ever use; IDUs; Aaraj [unknown]) 59.0% (ever use; IDUs; Ingold 1994) 5.8% (last sex; regular; IDUs; Aaraj [unknown]; Hermez et al. [unknown]) 34.6% (last sex; casual sex; IDUs; Aaraj [unknown]; Hermez et al. [unknown]) 39.3% (last sex; commercial sex, IDUs; Aaraj [unknown]; Hermez et al. [unknown]) 28.1% (always; nonregular clients; FSWs; Hermez et al. [unknown]) 34.8% (always; regular clients; FSWs; Hermez et al. [unknown]) 11.9% (always; regular partners; FSWs; Hermez et al [unknown]) 79.0% (ever use; FSWs; Hermez [unknown]) 98.0% (last sex; FSWs; Mishwar 2008) 94.0% (last sex; FSWs; Mishwar 2008) 43.0% (last sex; FSWs; Mishwar 2008) 80.0% (last sex; FSWs; Rady 2005) 32.3% (consistent; regular client; FSWs; Lebanon National AIDS Control Program 2008) 26.2% (consistent; nonclient; FSWs; Lebanon National AIDS Control Program 2008) 35.1% (consistent; vaginal sex; FSWs; Lebanon National AIDS Control Program 2008) 13.9% (consistent; oral sex; FSWs; Lebanon National AIDS Control Program 2008) 36.1% (consistent; anal sex; FSWs; Lebanon National AIDS Control Program 2008) 88.0% (ever use; MSM; Aaraj [unknown]) 47.1% (always; regular partners; MSM; Hermez et al.; Dewachi 2001) 54.5% (always; noncommercial casual partner; MSM; Hermez et al. [unknown]; Dewachi 2001) 47.0% (last anal sex; regular partner; MSM; Mishwar 2008) 66.0% (last anal sex; noncommercial casual partner; MSM; Mishwar 2008)
Morocco	16.0% (ever use; general population women; Chaouki et al. 1998) 9.0% (regular use; incarcerated women; El Ghrari et al. 2007) 10.0% (always; males; mainly IDUs; Asouab 2005; Morocco MOH [unknown]) 8.1% (usually; males; mainly IDUs; Asouab 2005) 38.4% (rarely; males; mainly IDUs; Asouab 2005) 43.6% (never; males; mainly IDUs; Asouab 2005) 22.0% (always; females; mainly IDUs; Asouab 2005; Morocco MOH [unknown])

Table 8.2 (Continued)

Country	Condom use
	4.9% (usually; females; mainly IDUs; Asouab 2005)
	29.3% (rarely; females; mainly IDUs; Asouab 2005)
	43.9% (never; females; mainly IDUs; Asouab 2005)
	59.0% (consistent; vaginal sex; FSWs; Alami 2009)
	9.7% (almost always; vaginal sex; FSWs; Alami 2009)
	22.2% (sometimes; vaginal sex; FSWs; Alami 2009)
	26.1% (consistent; anal sex; FSWs; Alami 2009)
	10.9% (almost always; anal sex; FSWs; Alami 2009)
	13.0% (sometimes; anal sex; FSWs; Alami 2009)
Oman	53%–69% (ever use; IDUs; Oman MOH 2006)
	12%–25% (always; IDUs; Oman MOH 2006)
	68%–100% (last year; MSM; IDUs; Oman MOH 2006)
Pakistan	7.0% (contraceptive method; general population; Measure DHS 2007)
	6.0% (ever use; general population; Raza et al. 1998)
	10.0% (commercial sex; migrant workers; Faisal and Cleland 2006)
	25.0% (sex with a female friend; migrant workers; Faisal and Cleland 2006)
	3%–6% (last sex with a nonspousal partner; truck drivers; Agha 2000)
	1.7% (last sex with FSW; truck drivers; Bokhari et al. 2007)
	0.0% (last sex with male or <i>hijra</i> ; truck drivers; Bokhari et al. 2007)
	40.0% (ever use; IDUs; Emmanuel and Fatima 2008)
	37.5% (ever use; IDUs; Lahore; Kuo et al. 2006)
	14.2% (ever use; IDUs; Quetta; Kuo et al. 2006)
	7.0% (ever use; IDUs; Parviz et al. 2006)
	34.0% (ever use; IDUs; Altaf et al. 2007)
	10.0% (ever use; IDUs; Haque et al. 2004)
	17%–34% (last commercial sex; IDUs; Bokhari et al. 2007)
	10%–25% (last anal sex sold to a man; IDUs; Bokhari et al. 2007)
	22%–39% (last vaginal or anal sex sold to a woman; IDUs; Bokhari et al. 2007)
	7%–13% (last anal sex paid to a man or <i>hijra</i> ; IDUs; Bokhari et al. 2007)
	46%–66% (not used last 6 months; nonpaid partners; IDUs; Pakistan National AIDS Control Program 2005)
	49%–86% (not used last 6 months; commercial sex; IDUs; Pakistan National AIDS Control Program 2005)
	45.0% (last sex; IDUs; Platt et al. 2009)
	32.0% (last sex; IDUs; Platt et al. 2009)
	17%–18% (always; FSWs; Pakistan National AIDS Control Program 2005)
	74%–81% (last month; FSWs; Pakistan National AIDS Control Program 2005)
	29%–49% (last sex; one-time client; FSWs; Bokhari et al. 2007)
	26%–47% (last sex; regular client; FSWs; Bokhari et al. 2007)
	21.0% (last sex; noncommercial partners; FSWs; Bokhari et al. 2007)
	17.0% (consistent last month; FSWs; Saleem, Adrien, and Razaque 2008)
	68.0% (ever use; FSWs; Pakistan National AIDS Control Program 2005)
	34.0% (last sex; noncommercial partners; FSWs; Pakistan National AIDS Control Program 2005)
	18.0% (consistent last month; FSWs; Pakistan National AIDS Control Program 2005)
	23.0% (consistent last month; FSWs; Pakistan National AIDS Control Program 2006–07)
	34.0% (last vaginal sex; FSWs; Blanchard, Khan, and Bokhari 2008)
	45.0% (last vaginal sex; FSWs; Pakistan National AIDS Control Program 2006–07)
	38.0% (last commercial vaginal sex; FSWs; Hawkes et al. 2009)
	12.0% (consistent last month during commercial vaginal sex; FSWs; Hawkes et al. 2009)
	61.0% (last commercial anal sex; FSWs; Hawkes et al. 2009)
	54.0% (last commercial oral sex; FSWs; Hawkes et al. 2009)
	46.0% (last sex with husband; FSWs; Hawkes et al. 2009)
	15.0% (consistent last month with husband; FSWs; Hawkes et al. 2009)
	7.9% (last anal sex; FSWs; Pakistan National AIDS Control Program 2006–07)
	32.4% (last oral sex; FSWs; Pakistan National AIDS Control Program 2006–07)
	3.1% (consistent; MSWs; Saleem, Adrien, and Razaque 2008)

(continued)

Table 8.2 (Continued)

Country	Condom use
	24.0% (last anal sex; MSWs; Pakistan National AIDS Control Program 2005)
	13.0% (last oral sex; MSWs; Pakistan National AIDS Control Program 2005)
	34.0% (last commercial sex; MSWs; Pakistan National AIDS Control Program 2008)
	32.5% (last sex; noncommercial partners; MSWs; Pakistan National AIDS Control Program 2008)
	7.1% (consistent last month; MSWs; Pakistan National AIDS Control Program 2005)
	8.0% (consistent last month; MSWs; Pakistan National AIDS Control Program 2006–07)
	24.0% (consistent last month; commercial sex; MSWs; Pakistan National AIDS Control Program 2008)
	22.2% (consistent last month; noncommercial partners; MSWs; Pakistan National AIDS Control Program 2008)
	21.0% (last anal sex; HSWs; Pakistan National AIDS Control Program 2005)
	15.0% (last oral sex; HSWs; Pakistan National AIDS Control Program 2005)
	32.3% (last commercial sex; HSWs; Pakistan National AIDS Control Program 2008)
	26.0% (last sex; noncommercial partners; HSWs; Pakistan National AIDS Control Program 2008)
	7.5% (consistent last month; HSWs; Pakistan National AIDS Control Program 2005)
	5.6% (consistent last month; HSWs; Pakistan National AIDS Control Program 2006–07)
	19.7% (consistent last month; commercial sex; HSWs; Pakistan National AIDS Control Program 2008)
	19.6% (consistent last month; noncommercial partners; HSWs; Pakistan National AIDS Control Program 2008)
	20%–52% (ever use; <i>hijras</i> ; Pakistan National AIDS Control Program 2005)
	20.0% (ever use; <i>hijras</i> ; Baqi et al. 1999)
	4.0% (consistent; <i>hijras</i> ; Saleem, Adrien, and Razaque 2008)
	18.0% (last sex; one-time client; <i>hijras</i> ; Khan et al. 2008)
	12.0% (last receptive anal sex; one-time client; <i>hijras</i> ; Khan et al. 2008)
	15.0% (last sex; regular client; <i>hijras</i> ; Khan et al. 2008)
	13.0% (last receptive anal sex; regular client; <i>hijras</i> ; Khan et al. 2008)
	9.0% (last sex; MSWs; Bokhari et al. 2007)
	17.0% (last month; nonpaying female; MSWs; Bokhari et al. 2007)
	23.0% (last commercial anal sex; <i>banthas</i> ; Hawkes et al. 2009)
	31.0% (last commercial anal sex; <i>khotkis</i> ; Hawkes et al. 2009)
	25.0% (last commercial anal sex; <i>khusras</i> ; Hawkes et al. 2009)
	10.0% (consistent last month during commercial anal sex; <i>banthas</i> ; Hawkes et al. 2009)
	8.0% (consistent last month during commercial anal sex; <i>khotkis</i> ; Hawkes et al. 2009)
	4.0% (consistent last month during commercial anal sex; <i>khusras</i> ; Hawkes et al. 2009)
	10.0% (last commercial oral sex; <i>banthas</i> ; Hawkes et al. 2009)
	8.0% (last commercial oral sex; <i>khotkis</i> ; Hawkes et al. 2009)
	4.0% (last commercial oral sex; <i>khusras</i> ; Hawkes et al. 2009)
	0.0% (last sex with <i>gyria</i> ; <i>banthas</i> ; Hawkes et al. 2009)
	27.0% (last sex with <i>gyria</i> ; <i>khotkis</i> ; Hawkes et al. 2009)
	7.0% (last sex with <i>gyria</i> ; <i>khusras</i> ; Hawkes et al. 2009)
	0.0% (consistent last month with <i>gyria</i> ; <i>banthas</i> ; Hawkes et al. 2009)
	8.0% (consistent last month with <i>gyria</i> ; <i>khotkis</i> ; Hawkes et al. 2009)
	7.0% (consistent last month with <i>gyria</i> ; <i>khusras</i> ; Hawkes et al. 2009)
Somalia	12.7% (ever use; general population men; WHO 2004)
	5.0% (ever use; general population women; WHO 2004)
	2.6% (recent use; general population; Scott et al. 1991)
	14.0% (last sex; general population women; WHO/EMRO 2000)
	15.2% (last sex; general population men; WHO/EMRO 2000)
	10.3% (last sex; merchants/drivers; WHO/EMRO 2000)
Sudan	5.8% (ever use; street children; Ahmed 2004h)
	6.2% (ever use; university students; Ahmed 2004i)
	37.6% (ever use; university students; Sudan National HIV/AIDS Control Program 2004)
	3.6% (consistent; university students; Sudan National HIV/AIDS Control Program 2004)
	1.2% (last sex; rural population females; SNAP, UNICEF, and UNAIDS 2005)
	2.2% (last sex; rural population males; SNAP, UNICEF, and UNAIDS 2005)
	3.0% (last year; general population; Southern Sudan; NSNAC and UNAIDS 2006)
	2.0% (last sex with casual partner; general population; Sudan National HIV/AIDS Control Program 2004)

Table 8.2 (Continued)

Country	Condom use
	2.7% (ever use; ANC women attendees; Ahmed 2004b)
	5.0% (last sex with spouse; men; Southern Sudan; UNHCR 2007)
	1.0% (last sex with spouse; women; Southern Sudan; UNHCR 2007)
	31.0% (last sex with spouse; refugees; men; Southern Sudan; UNHCR 2007)
	5.0% (last sex with spouse; refugees; women; Southern Sudan; UNHCR 2007)
	46.3% (last sex with casual partner; men; Southern Sudan; UNHCR 2007)
	0.0% (last sex with casual partner; women; Southern Sudan; UNHCR 2007)
	22.5% (consistent with casual partner; men; Southern Sudan; UNHCR 2007)
	0.0% (consistent with casual partner; women; Southern Sudan; UNHCR 2007)
	0.0% (last sex with commercial partner; men; Southern Sudan; UNHCR 2007)
	0.0% (last sex with commercial partner; women; Southern Sudan; UNHCR 2007)
	16.0% (ever use among sexually active; men; Southern Sudan; UNHCR 2007)
	3.0% (ever use among sexually active; women; Southern Sudan; UNHCR 2007)
	1.0% (ever use; tea sellers; Ahmed 2004j)
	3.0% (ever use; internally displaced persons; IGAD 2006)
	5.0% (ever use; internally displaced persons; Ahmed 2004c)
	0.0% (ever use; Sudanese women refugees; Holt et al. 2003)
	8.9% (ever use; truck drivers; Farah and Hussein 2006)
	2.4% (ever use; truck drivers; Ahmed 2004k)
	2.7% (ever use; military personnel; Ahmed 2004d)
	4.0% (ever use; prisoners; Ahmed 2004e)
	15.8% (ever use; prisoners; Assal 2006)
	1.7% (ever use; TB patients; Ahmed 2004i)
	5.4% (ever use; STD clinic attendees; Ahmed 2004g)
	0.0% (ever use; suspected AIDS patients; Ahmed 2004a)
	10.4% (ever used; military personnel; Sudan National HIV/AIDS Control Program 2004)
	1.7% (consistent; military personnel; Sudan National HIV/AIDS Control Program 2004)
	2.0% (last sex; clients of FSWs; SNAP, UNICEF, and UNAIDS 2005)
	2.1% (regularly; FSWs and tea sellers; Basha 2006)
	10.3% (ever use; FSWs; Ahmed 2004f)
	16.7% (ever use; FSWs; Yousif 2006)
	13.0% (regularly; FSWs; Ati 2005)
	24.6% (ever use; FSWs; ACORD 2006)
	57.8% (ever use; FSWs; Ati 2005)
	23.0% (ever use; FSWs; Anonymous 2007)
	86.2% (ever use; MSM; Elrashied 2006)
	50.9% (every time or almost every time; MSM; Elrashied 2006)
	58.5% (last commercial sex; MSM; Elrashied 2006)
	48.5% (last noncommercial sex; MSM; Elrashied 2006)
	72.9% (ever use; MSM; Elrashied 2006)
	89.4% (last six months; female partners; MSM; Elrashied 2006)
Syrian Arab Republic	13.2% (always; FSWs; Syria MOH 2004)
	20.6% (often; FSWs; Syria MOH 2004)
	51.0% (sometimes; FSWs; Syria MOH 2004)
	15.2% (never; FSWs; Syria MOH 2004)
	39.0% (less than half the time; Syria Mental Health Directorate 2008)
	21.0% (more than half the time; Syria Mental Health Directorate 2008)
	19.0% (consistent; Syria Mental Health Directorate 2008)
	27.0% (less than half the time; commercial sex; Syria Mental Health Directorate 2008)
	5.0% (more than half the time; commercial sex; Syria Mental Health Directorate 2008)
	17.0% (consistent; commercial sex; Syria Mental Health Directorate 2008)
Tunisia	65.0% (ever use; FSWs; Hassen et al. 2003)
	37.0% (always; FSWs; Hassen et al. 2003)
	27.0% (sometimes; FSWs; Hassen et al. 2003)
	46.4% (last nonpaid sex; MSM; Hsairi and Ben Abdallah 2007)

(continued)

Table 8.2 (Continued)

Country	Condom use
	19.7% (consistent during nonpaid sex; MSM; Hsairi and Ben Abdallah 2007) 53.7% (last sex with females; MSM; Hsairi and Ben Abdallah 2007) 55.4% (last paid sex; MSM; Hsairi and Ben Abdallah 2007)
Turkey	70.0% (always; FSWs; Gul et al. 2008)
Yemen, Republic of	57.1% (last paid sex; FSWs; Štulhofer and Božicevic 2008) 28.8% (last nonpaid sex; FSWs; Štulhofer and Božicevic 2008) 50.0% (consistent; nonregular clients; FSWs; Štulhofer and Božicevic 2008) 58.0% (consistent; regular clients; FSWs; Štulhofer and Božicevic 2008)

Note: ANC = antenatal clinic; CSW = commercial sex worker; HSW = *hijra* sex worker; IDU = injecting drug user; STD = sexually transmitted disease; TB = tuberculosis.

partner refusal,⁸ pharmacies are too far,⁹ not thinking of them as necessary,¹⁰ or fear of imprisonment if caught possessing them (such as for FSWs and MSM).¹¹ Condom accessibility varies by population group. In Pakistan, condom accessibility at any time varied between 5.9% among truck drivers and 67.5% among FSWs.¹²

Condom use as a contraception method also appears to be low in MENA. In Jordan, 84.4% of women knew about condoms, but only 2.4% reported using them for family planning.¹³ Several factors have been cited for their limited use as a contraception method including reduced sexual pleasure, inconvenience, adverse experiences, gender-related issues, and social stigma attached to condoms as a birth control method.¹⁴ Nevertheless, effective national family planning programs appear to have increased condom knowledge and its use for HIV prevention, such as in the Islamic Republic of Iran, where relatively higher levels of condom knowledge and use can be found.¹⁵ The Islamic Republic of Iran also appears to be the only MENA country to possess a condom manufacturing facility, which produces 45 million condoms per year.¹⁶

There appears to be a gender gap in condom knowledge. In the Islamic Republic of Iran, male college students were almost twice as likely as females, 62% versus 39%, to know about condoms as a sexually transmitted infection (STI) prevention method.¹⁷ Lack of culturally sensitive and gender-specific information appears to contribute to this gap, suggesting the need for targeted, gender-specific, and culturally sensitive information regarding condom use for HIV prevention.¹⁸ Men in MENA also appear to have a negative attitude toward condom use.¹⁹

Analytical summary

Condom knowledge varies in MENA and tends to be low in resource-limited settings. Although a substantial fraction of the MENA population knows about condoms, people are not as aware about their use for HIV prevention. Condom knowledge as a means of HIV prevention does not translate into actual condom use. And even when condoms are used for HIV prevention, they are not used consistently. Condom use is low even among the priority populations that are at the highest risk of infection. Though condoms are accessible from pharmacies in many parts of MENA, they are less accessible in other parts, particularly in resource-limited settings. All of these factors indicate that the majority of at-risk sexual acts in MENA are not protected against HIV infection.

⁸ Tehrani and Malek-Afzalip, "Knowledge, Attitudes and Practices."

⁹ Hermez et al., "HIV/AIDS Prevention."

¹⁰ Khan et al., "Correlates and Prevalence of HIV."

¹¹ Rajabali et al., "HIV and Homosexuality in Pakistan"; Lebanon National AIDS Control Program, "A Case Study."

¹² Bokhari et al., "HIV Risk in Karachi and Lahore, Pakistan."

¹³ Measure DHS, "Jordan Demographic and Health Survey 1997."

¹⁴ Kulczycki, "The Sociocultural Context."

¹⁵ Hajiabdolbaghi et al., "Insights from a Survey"; Roudi, "Iran's Revolutionary Approach."

¹⁶ Mehryar, Ahmad-Nia, and Kazemipour, "Reproductive Health in Iran."

¹⁷ Simbar, Tehrani, and Hashemi, "Reproductive Health Knowledge."

¹⁸ Lazarus et al., "HIV/AIDS Knowledge."

¹⁹ Ibid.

Knowledge of condoms as a means of HIV prevention needs to be increased and their use for safe sex must be highlighted. This would be best achieved through culturally sensitive and gender-specific awareness programs.

HIV/AIDS KNOWLEDGE AND ATTITUDES

One of the few areas relevant to HIV/AIDS for which there has been ample research in MENA is that of the levels of HIV/AIDS knowledge and attitudes in different population groups. The evidence confirms the variability in the levels of knowledge and nature of attitudes across and within MENA countries, but there are still key features that characterize much of HIV/AIDS knowledge and attitudes in this region.

Levels of HIV/AIDS basic knowledge

In the majority of MENA populations, the level of HIV/AIDS basic knowledge is high. In Egypt, 84.4% of ever-married women reported knowing about HIV/AIDS.²⁰ In Pakistan, 86.8% of migrant workers had heard of HIV/AIDS.²¹ This high basic knowledge level has been seen in the majority of studies (table E.1 in appendix E). In some settings in MENA, however, low levels of basic knowledge have also been documented. In Afghanistan, 50.8% of women were aware of HIV/AIDS in one study and only 20% knew that HIV is sexually transmitted.²² This limited basic knowledge has been observed in a minority of studies (table E.1 in appendix E).

Levels of HIV/AIDS comprehensive knowledge

Despite widespread basic knowledge, the level of comprehensiveness of HIV/AIDS knowledge is inadequate.²³ In Egypt, only 6.1% of ever-married women had comprehensive knowledge of HIV/AIDS.²⁴ In Somalia, only 4% of young women had comprehensive knowledge of HIV/AIDS.²⁵

²⁰ Measure DHS, "Egypt: Demographic and Health Survey 2005."

²¹ Faisal and Cleland, "Study of the Sexual Behaviours."

²² Todd et al., "Seroprevalence and Correlates of HIV."

²³ Abolfotouh, "The Impact of a Lecture"; Farghaly and Kamal, "Study of the Opinion and Level of Knowledge about AIDS."

²⁴ Measure DHS, "Egypt: Demographic and Health Survey 2005."

²⁵ Somaliland Ministry of Health and Labour, *Somaliland 2007 HIV/Syphilis Seroprevalence Survey*.

Many people may have heard of HIV/AIDS, but are unaware of its different transmission modes and clinical manifestations of infection and disease.²⁶ Knowledge of transmission modes is biased by the sociocultural context, where some transmission modes, such as sharing of injections, can be widely known, but other transmission modes, such as sexual relations within marriage, are not thought of as a transmission mode.²⁷ This pattern of low comprehensive knowledge has been seen in many studies (table E.2 in appendix E).

A few studies, however, have identified fairly good levels of comprehensive knowledge in specific populations, including a general population group in the Islamic Republic of Iran²⁸ and prisoners, FSWs, MSM, and injecting drug users (IDUs) in Lebanon.²⁹ Comparing knowledge, attitudes, and practices (KAP) surveys in Sudan from 2002 and 2005 found a substantial improvement in HIV/AIDS knowledge.³⁰ The level of HIV/AIDS knowledge appears to be steadily improving.

Levels of HIV/AIDS misinformation

There is a high level of misinformation and many misconceptions about HIV/AIDS in MENA.³¹ In the Islamic Republic of Iran, one-third of high school students believed that HIV can be transmitted by mosquitoes.³² In Saudi Arabia, 49% of health care workers (HCWs) identified casual kissing as a transmission mode.³³ In Sudan, one-fifth of antenatal clinic (ANC) attendees believed they could acquire HIV by sharing a meal with an HIV-positive person.³⁴ This high level of misinformation has been seen in many other studies (table E.3 in appendix E).

Perception of risk of HIV infection

Most people in MENA do not consider themselves at risk of HIV infection. In Djibouti, 80%

²⁶ Genc et al., "AIDS Awareness and Knowledge."

²⁷ UNAIDS, "Key Findings."

²⁸ Montazeri, "AIDS Knowledge and Attitudes."

²⁹ Mishwar, "An Integrated Bio-Behavioral Surveillance Study"; Rady, "Knowledge, Attitudes and Prevalence."

³⁰ SNAP, UNICEF, and UNAIDS, "Baseline Study on Knowledge."

³¹ Abolfotouh, "The Impact of a Lecture"; Farghaly and Kamal, "Study of the Opinion and Level of Knowledge about AIDS."

³² Tavoosi et al., "Knowledge and Attitude."

³³ Mahfouz et al., "Knowledge and Attitudes."

³⁴ Ahmed, *Antenatal*.

of high school students reported not being at risk of HIV infection.³⁵ In Jordan, 82% of general population women reported not being at risk for HIV at all.³⁶ In the Republic of Yemen, 95.1% of secondary school students believed that young people are not susceptible to HIV infection.³⁷

Attitudes toward people living with HIV

Attitudes toward people living with HIV (PLHIV) vary within and between populations, though generally the norm is that of negative and discriminatory attitudes. Different studies have documented both tolerant and intolerant attitudes, often even within the same population. In Egypt, 99% of general population women did not accept all four positive attitudes toward PLHIV, including caring for patients with AIDS-related illness, buying from HIV-positive shopkeepers, allowing HIV-positive women to teach, and being willing to disclose the infection of a family member.³⁸ The stigma, discrimination, and phobia are most worrying among HCWs. There is an environment of risk exaggeration in dealing with PLHIV,³⁹ such as among nurses in both Egypt⁴⁰ and the Islamic Republic of Iran.⁴¹ Over half of Kuwaiti physicians would avoid contact with PLHIV.⁴² These negative attitudes have been seen in many other studies (table E.4 in appendix E).

There is an immense stigma and human rights issues surrounding HIV in MENA.⁴³ Fear of stigmatization and feelings of anxiety, hopelessness, and depression are frequently reported by PLHIV.⁴⁴ High profile violations of basic rights of PLHIV have been widely reported.⁴⁵ The rights to confidentiality and consent are repeatedly violated.⁴⁶ Several aspects of human sexuality

are deemed unacceptable.⁴⁷ The attitudes toward PLHIV depend strongly on the social acceptability of the transmission mode by which people become infected.⁴⁸ Religiosity has been associated with both positive⁴⁹ and negative⁵⁰ attitudes toward PLHIV.

The negative attitudes may be due in part to the invisible nature of the epidemic.⁵¹ As a consequence of low HIV prevalence, most people have never been in contact with a patient with an AIDS-related illness. In the Syrian Arab Republic, only 2.8% of FSWs reported knowing a relative or a friend who was HIV positive.⁵² The lack of comprehensive and proper knowledge of HIV/AIDS is a major factor in discriminatory attitudes. In the Islamic Republic of Iran, positive attitudes were found to be directly correlated with higher knowledge of this disease.⁵³ The increasing visibility of HIV in MENA may lead to improved attitudes toward PLHIV.

Despite prevailing negative attitudes, several studies have documented positive attitudes in a few MENA populations. In the Islamic Republic of Iran, 84% of general population respondents supported the social rights of PLHIV to work and study,⁵⁴ and 95% said that patients with AIDS-related illness deserve respect as human beings.⁵⁵ In Libya, 91% of high school students supported providing free care to PLHIV.⁵⁶ In Morocco, 68% of general population women said they would take care of PLHIV.⁵⁷ Encouragingly, there appears to be a trend of decreasing discrimination and stigmatization toward PLHIV. In Jordan, the percentages of youth who believed that PLHIV have the right to keep their illness a secret has increased from 18% in 1994,⁵⁸ to 29% in 1999,⁵⁹ and to 34.3% in 2005.⁶⁰

³⁵ Rodier et al., "HIV Infection."

³⁶ Measure DHS, "Jordan: Demographic and Health Survey 1997."

³⁷ Gharamah and Baktayan, "Exploring HIV/AIDS Knowledge."

³⁸ Measure DHS, "Egypt: Demographic and Health Survey 2005."

³⁹ Duyan, Agalar, and Sayek, "Surgeons' Attitudes toward HIV/AIDS in Turkey."

⁴⁰ Shouman and Fotouh, "The Impact of Health Education."

⁴¹ Askarian et al., "Knowledge about HIV Infection."

⁴² Fido and Al Kazemi, "Survey of HIV/AIDS Knowledge."

⁴³ DeJong et al., "The Sexual and Reproductive Health."

⁴⁴ Kabbash et al., "Needs Assessment."

⁴⁵ Moszynski, "Egyptian Doctors."

⁴⁶ Mobeireek et al., "Information Disclosure and Decision-Making."

⁴⁷ Mohammadi et al., "Reproductive Knowledge, Attitudes and Behavior."

⁴⁸ Badahdah, "Saudi Attitudes towards People Living with HIV/AIDS."

⁴⁹ Paruk et al., "Compassion or Condemnation?"

⁵⁰ Badahdah, "Saudi Attitudes towards People Living with HIV/AIDS."

⁵¹ UNAIDS, "Key Findings."

⁵² Syria MOH, "HIV/AIDS Female Sex Workers."

⁵³ Mazloomi and Baghianimoghaddam, "Knowledge and Attitude"; Hedayati-Moghaddam, "Knowledge of and Attitudes."

⁵⁴ Montazeri, "AIDS Knowledge and Attitudes in Iran."

⁵⁵ IRIB, "Poll of Teheran Public on AIDS (2006)."

⁵⁶ El-Gadi, Abudher, and Sammad, "HIV-Related Knowledge and Stigma."

⁵⁷ Zidouh, "VIH/SIDA et Infections sexuellement transmissibles."

⁵⁸ Jordan National AIDS Control Programme, *Report on the National KABP Survey* (1994).

⁵⁹ Jordan National AIDS Control Programme, *Report on the National KABP Survey* (1999).

⁶⁰ Jordan National AIDS Control Programme, *Report on the National KABP Survey* (2005).

Similar improvement in attitudes was also reported among university students in Sudan.⁶¹

Sources of HIV/AIDS knowledge

Television is by far the main source of HIV/AIDS knowledge in MENA. The percentage of different populations who identified television as the main source of their HIV/AIDS knowledge was 98% in Egypt,⁶² 83.6% in the Islamic Republic of Iran,⁶³ 92% in Pakistan,⁶⁴ and 90% in Sudan.⁶⁵ This has been seen in many other studies (table E.5 in appendix E). Radio is also a major source of HIV/AIDS information in resource-limited parts of the region, such as Sudan.⁶⁶ Mass media is undoubtedly the most effective method of disseminating HIV/AIDS knowledge in this region, but messages cannot be sexually explicit due to cultural sensitivities.⁶⁷ Television has already proven to be an effective tool in disseminating birth control information during family planning campaigns in MENA.⁶⁸ Television has also been reported as a preferred mode of disseminating information, particularly among youth.⁶⁹

Educational institutions are seldom a main source of HIV/AIDS knowledge. Only 24% of high school students in the Islamic Republic of Iran reported educational programs,⁷⁰ and only 15% reported schoolbooks,⁷¹ as a source of HIV/AIDS information. In the Republic of Yemen, only 29% heard about HIV/AIDS from their teachers.⁷² However, two studies from the Republic of Yemen provide rare examples where schools were the main source of knowledge: 63%⁷³ and 71.3%⁷⁴ of high school students

identified schools as a main source of HIV/AIDS knowledge, indicating a potential role for schools in disseminating correct knowledge about HIV/AIDS to youth. Still, 60%⁷⁵ and 88.4%⁷⁶ of the students also identified television as a main source of knowledge.

Religious leaders are not a main source of HIV/AIDS information in MENA, although strong preference has been reported for them to be the source of HIV/AIDS knowledge.⁷⁷ In Jordan, only 7.3%⁷⁸ and 11.6%⁷⁹ of youth reported religious leaders as a source of information about HIV/AIDS. Parents are also not a main source of HIV/AIDS knowledge. Only 27% of Iranian adolescents reported parents as a source of HIV/AIDS information.⁸⁰

Differentials in HIV/AIDS knowledge

Research in MENA has identified differentials in HIV/AIDS knowledge. Gender differential varies across populations, though males tend to have better knowledge than females. Women appear to have inferior access to HIV/AIDS sources of information compared to men.⁸¹ They may also have limited knowledge about their bodies and reproductive health, leading to feelings of helplessness.⁸² In Egypt, female IDUs were found to have significantly less knowledge about HIV/AIDS than male IDUs.⁸³ In Pakistan,⁸⁴ Turkey,⁸⁵ and the Republic of Yemen,⁸⁶ male youth had better knowledge of HIV/AIDS than female youth. In the Republic of Yemen, 94.3% and 55.6% of males had ever heard of HIV/AIDS and condoms, respectively, but for females, the corresponding percentages were 80.8 and 41, respectively.⁸⁷

⁶¹ Sudan National HIV/AIDS Control Program, *HIV/AIDS/STIs Prevalence*.

⁶² Measure DHS, "Egypt: Demographic and Health Survey 2005."

⁶³ Karimi and Ataei, "The Assessment of Knowledge."

⁶⁴ Khan et al., "Awareness about Common Diseases."

⁶⁵ SNAP, UNICEF, and UNAIDS, "Baseline Study on Knowledge."

⁶⁶ Yousif, "Health Education Programme"; Ahmed, *Sex Sellers*; Ahmed, *Antenatal*; Ahmed, *Tea Sellers*; Ahmed, *Military*; Ahmed, *Truck Drivers*; Ahmed, *Prisoners*; Sudan National HIV/AIDS Control Program, *HIV/AIDS/STIs Prevalence*; UNHCR, "HIV Behavioural Surveillance Survey"; Ahmed, *University Students*; Ahmed, *TB Patients*; Ahmed, *Internally Displaced People*; Ahmed, *Street Children*; Ahmed, *STDs*; Ahmed, *AIDS Patients*.

⁶⁷ Lynn, "Pakistan Launches Media Blitz on AIDS."

⁶⁸ El-Bakly and Hess, "Mass Media Makes a Difference."

⁶⁹ Sudan National HIV/AIDS Control Program, *HIV/AIDS/STIs Prevalence*.

⁷⁰ Karimi and Ataei, "The Assessment of Knowledge."

⁷¹ Yazdi et al., "Knowledge, Attitudes and Sources of Information."

⁷² Al-Serouri, "Assessment of Knowledge."

⁷³ Gharamah and Baktayan, "Exploring HIV/AIDS Knowledge."

⁷⁴ Raja and Farhan, "Knowledge and Attitude."

⁷⁵ Gharamah and Baktayan, "Exploring HIV/AIDS Knowledge."

⁷⁶ Raja and Janjua, "Epidemiology of Hepatitis C."

⁷⁷ Ibid.

⁷⁸ Jordan National AIDS Control Programme, *Report on the National KABP Survey (2004)*.

⁷⁹ Jordan National AIDS Control Programme, *Report on the National KABP Survey (2005)*.

⁸⁰ Yazdi et al., "Knowledge, Attitudes and Sources of Information."

⁸¹ Manhart et al., "Sexually Transmitted Diseases in Morocco."

⁸² Boyacioglu and Turkmen, "Social and Cultural Dimensions."

⁸³ Salama et al., "HIV/AIDS Knowledge and Attitudes."

⁸⁴ Raza et al., "Knowledge, Attitude and Behaviour."

⁸⁵ Savaser, "Knowledge and Attitudes."

⁸⁶ Yemen Central Statistical Organization, *Yemen Demographic, Maternal and Child Health Survey 1997*.

⁸⁷ Busulwa, "HIV/AIDS Situation Analysis Study."

Bucking the trend, several studies have documented the opposite tendency, probably reflecting female mass education gains over the last few decades.⁸⁸ In Afghanistan, female university students were more knowledgeable than males.⁸⁹ In the Islamic Republic of Iran, HIV/AIDS knowledge among female high school students,⁹⁰ youth,⁹¹ teachers,⁹² and prisoners⁹³ was found to be higher than that of males. In further studies of college students⁹⁴ and the general population⁹⁵ in the Islamic Republic of Iran, of high school students⁹⁶ in Libya, and of high school students⁹⁷ in the Republic of Yemen, no gender differential in knowledge was found.

Other common differentials in knowledge are those of urban versus rural populations, and refugees, internally displaced populations, or minorities versus the bulk of the general population. Rural residents have been found, such as in Egypt⁹⁸ and Jordan,⁹⁹ to have inferior HIV/AIDS knowledge compared to urban populations. Refugees in the Republic of Yemen were found to have lower knowledge than a marginalized minority (Al-Akhdam), and Al-Akhdam were found to have lower knowledge than the rest of the general population.¹⁰⁰

Other aspects of HIV/AIDS knowledge

It appears that a considerable fraction of women who have heard of HIV/AIDS also know of the risk of transmission from mothers to their babies. In Egypt, 75.8%, 70.4%, and 51.7% of general population women knew that HIV can be transmitted during pregnancy, delivery, and breastfeeding, respectively.¹⁰¹ In Jordan these percentages were 70.1, 54.6, and 42.3, respectively.¹⁰² In Morocco, 58% knew of the risk of

transmission through breastfeeding.¹⁰³ However, in Sudan, only 4.3% to 39.8% of diverse population groups reported knowing about the risk of mother-to-child transmission.¹⁰⁴ Yet in a more recent study, 80% of a general population group in Southern Sudan knew of the risk of mother-to-child transmission during pregnancy and birth, and 71% knew of the risk through breastfeeding.¹⁰⁵

Finally, it appears that knowledge of STIs other than HIV is substantially lower than that of HIV/AIDS.¹⁰⁶ While 98% of women in Egypt knew of HIV/AIDS, only 21.8% knew of other STIs.¹⁰⁷ In Jordan, only 27.4% of women knew of other STIs,¹⁰⁸ and in Morocco, 69% of general population women declared that they do not know of other STIs.¹⁰⁹ However, a study among a general population in Southern Sudan found that 90% have heard of STIs.¹¹⁰

Analytical summary

MENA countries have made considerable gains in increasing HIV/AIDS basic awareness and knowledge in recent years. The vast majority of the populations are aware of HIV/AIDS and some of its transmission modes. Seventy-five percent of university students in Sudan have been exposed to HIV/AIDS education.¹¹¹ Substantial gains in knowledge and prevention practices have been reported in Pakistan among priority populations, partially due to an expansion of prevention programs in recent years.¹¹² Yet, comprehensive and proper knowledge of HIV/AIDS remains elusive, and misinformation, misconceptions, and myths abound. Most people appear to perceive greater risk for others than for themselves, and behavioral practices may be combining a low level of partner

⁸⁸ Roudi-Fahimi and Moghadam, "Empowering Women, Developing Society."

⁸⁹ Mansoor et al., "Gender Differences in KAP."

⁹⁰ Karimi and Ataei, "The Assessment of Knowledge."

⁹¹ Yazdi et al., "Knowledge, Attitudes and Sources of Information."

⁹² Mazloomi and Baghianimoghadam, "Knowledge and Attitude."

⁹³ Nakhaee, "Prisoners' Knowledge."

⁹⁴ Simbar, Tehrani, and Hashemi, "Reproductive Health Knowledge."

⁹⁵ Montazeri, "AIDS Knowledge."

⁹⁶ El-Gadi, Abudher, and Sammut, "HIV-Related Knowledge and Stigma."

⁹⁷ Gharamah and Baktayan, "Exploring HIV/AIDS Knowledge."

⁹⁸ Measure DHS, "Egypt: Demographic and Health Survey 2005."

⁹⁹ Measure DHS, "Jordan: Demographic and Health Survey 2002."

¹⁰⁰ Al-Serouri, "Assessment of Knowledge."

¹⁰¹ Measure DHS, "Egypt: Demographic and Health Survey 2005."

¹⁰² Measure DHS, "Jordan: Demographic and Health Survey 2002."

¹⁰³ Zidouh, "VIH/SIDA et Infections sexuellement transmissibles."

¹⁰⁴ Ahmed, *Sex Sellers*; Ahmed, *Antenatal*; Ahmed, *Tea Sellers*; Ahmed, *Military*; Ahmed, *Truck Drivers*; Ahmed, *Prisoners*; Ahmed, *University Students*; Ahmed, *TB Patients*; Ahmed, *Internally Displaced People*; Ahmed, *Street Children*; Ahmed, *STDs*; Ahmed, *AIDS Patients*.

¹⁰⁵ UNHCR, "HIV Behavioural Surveillance Survey."

¹⁰⁶ SNAP, UNICEF, and UNAIDS, "Baseline Study on Knowledge."

¹⁰⁷ Measure DHS, "Egypt: Demographic and Health Survey 2005."

¹⁰⁸ Measure DHS, "Jordan: Demographic and Health Survey 2002."

¹⁰⁹ Zidouh, "VIH/SIDA et Infections sexuellement transmissibles."

¹¹⁰ UNHCR, "HIV Behavioural Surveillance Survey."

¹¹¹ Sudan National HIV/AIDS Control Program, *HIV/AIDS/STIs Prevalence*.

¹¹² Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Rounds I, II, and III).

exchange with widespread disregard for safe sex.¹¹³ There are, however, some encouraging trends, such as in the Islamic Republic of Iran, where more emphasis is placed on safe sex.¹¹⁴

Of particular concern is the limited HIV/AIDS knowledge among priority populations, because these are the populations where HIV has the greatest potential for spread. Illiteracy is a barrier to expanding HIV/AIDS knowledge in some countries, such as Afghanistan, where only 47% of males and 15% of females can read.¹¹⁵ Stakeholders continue to view reproductive health and sex education as encouraging high-risk activities, though increased knowledge has been associated with less risky behavior.¹¹⁶ HIV/AIDS information is normally acquired through mass media or personal experiences rather than awareness programs.¹¹⁷ Media and peers may not provide accurate information on sexual health.¹¹⁸

There is immense stigma and human rights issues surrounding HIV in MENA. Attitudes toward PLHIV are generally negative and discriminatory. Encouragingly, there appears to be a trend of decreasing discrimination and stigmatization, but the region as a whole is still far from addressing this challenge.

Media and religious scholars are often cited as preferred sources of HIV/AIDS knowledge.¹¹⁹ Peers, teachers, and HCWs are also cited as preferred sources of HIV/AIDS knowledge.¹²⁰ Proper HIV/AIDS knowledge and stigma reduction programs can be expanded by taking advantage of mass media, especially television, and by involving religious scholars in educational campaigns. Educational programs can also contribute to the expansion of knowledge. Even a single educational session has been found to be useful in significantly increasing HIV/AIDS knowledge and awareness in a MENA context.¹²¹ Group education

and individual counseling programs have been proven useful in increasing knowledge in Egypt,¹²² the Islamic Republic of Iran,¹²³ Saudi Arabia,¹²⁴ and Sudan.¹²⁵ Education should be expanded in schools, colleges, and universities because these institutions are currently far below their potential of being among the main sources and disseminators of HIV/AIDS knowledge.¹²⁶ Well-designed peer education programs may also be effective considering the dense social and family networks in MENA.¹²⁷ Peer group education has been found effective among prisoners in the Islamic Republic of Iran.¹²⁸

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¹¹³ Chemtob et al., "Getting AIDS."

¹¹⁴ Kalkhoran and Hale, "AIDS Education in an Islamic Nation."

¹¹⁵ World Bank, *HIV/AIDS in Afghanistan*.

¹¹⁶ Grunseit, "Impact of HIV."

¹¹⁷ Tehrani and Malek-Afzalip, "Knowledge, Attitudes and Practices."

¹¹⁸ El-Kak et al., "High School Students."

¹¹⁹ Farah and Hussein, "HIV Prevalence"; Al-Serouri, "Assessment of Knowledge."

¹²⁰ Al-Serouri, "Assessment of Knowledge"; Mohammadi et al., "Reproductive Knowledge."

¹²¹ Ergene et al., "A Controlled-Study"; Khan, "Country Watch: Pakistan."

¹²² Salama et al., "HIV/AIDS Knowledge and Attitudes."

¹²³ Jodati et al., "Impact of Education."

¹²⁴ Saleh et al., "Impact of Health Education."

¹²⁵ Yousif, "Health Education Programme."

¹²⁶ Yazdi et al., "Knowledge, Attitudes and Sources of Information"; Jodati et al., "Impact of Education."

¹²⁷ Ergene et al., "A Controlled-Study"; Jodati et al., "Impact of Education."

¹²⁸ Afshar, "From the Assessment to the Implementation of Services."

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HIV/AIDS and Vulnerability Settings

Vulnerable populations are defined in our conceptual framework as subpopulations within the general population who are in principle not at high risk of human immunodeficiency virus (HIV) infection, such as prisoners, youth, and mobile populations, but are vulnerable, because of the nature of their living experiences, to practices that may expose them to HIV. Once these vulnerable populations adopt high-risk practices, they are no longer part of our definition of the general population, but become part of the high-risk priority or bridging populations.

The settings of vulnerabilities in the Middle East and North Africa (MENA) are diverse and a large fraction of the population belongs to one or multiple vulnerability settings. A number of populations have been widely identified as vulnerable in the MENA context including prisoners, youth, refugees, internally displaced persons (IDPs), migrant workers, industrial zone workers, fishermen, road builders, the unemployed, sexual partners of injecting drug users (IDUs), tea and *qat* sellers, *geeza* women (serve men who chew *qat*)¹, domestic maids, noninjecting drug users, frequent travelers, tourism workers, health care workers (HCWs), street children, runaway and divorced women, minorities (such as the 200,000 Al-Akhdam in the Republic of Yemen²), and temporary and casual workers.

¹ Tchupo, *Les maladies sexuellement transmissibles*.

² Busulwa, "HIV/AIDS Situation Analysis Study"; Al Ahmadi and Beatty, "Participatory-Socio Economic Needs Survey."

A number of general vulnerability factors have also been identified in the region. These include weak systems of surveillance for all sexually transmitted infections (STIs), a seasonal influx of tourists from both within and outside the region, migrant workers engaging in risky behavior while abroad, a low level of condom knowledge and use, and a lack of adequate knowledge of HIV/AIDS.

Considering the established evidence in other regions of vulnerabilities driving HIV transmission,³ this chapter discusses the settings of vulnerability from the angle of how these vulnerabilities may contribute as drivers of the region's HIV epidemic. This chapter focuses on the three key vulnerable populations: prisoners, youth, and mobile populations.

PRISONERS AND HIV

The prison environment is conducive to high-risk behaviors, and priority groups, such as IDUs, are often vastly overrepresented among prison inmates.⁴ Imprisonment and repeated imprisonments are common among IDUs.⁵ Outbreaks of HIV among prisoners driven by

³ Parker, Easton, and Klein, "Structural Barriers and Facilitators in HIV Prevention."

⁴ Gaughwin, Douglas, and Wodak, "Behind Bars."

⁵ Dolan et al., "HIV in Prison."

IDU have been reported in different countries around the globe.⁶

The prison population is dynamic, with prisoners and staff moving in and out on a frequent basis.⁷ There is extensive evidence of a higher risk of HIV infection among prisoners in both developing⁸ and developed settings.⁹ In the United States, one-fourth of the people living with HIV (PLHIV) pass through a correctional facility every year.¹⁰ Also in the United States, having sex with a partner who has been incarcerated is a major HIV risk factor for African American women.¹¹

The proportion of people who engage in high-risk behavior in prisons is known to be higher than that in the rest of the population.¹² There is a history of prisons serving as a “social petri dish” for increasing the HIV epidemic.¹³ The evidence reviewed below suggests that the prisoner population in MENA is a key HIV vulnerable population.

HIV prevalence among prisoners

Different levels of HIV prevalence have been documented among prisoners in MENA. HIV prevalence among prisoners is generally found to be much higher than that of the general population.¹⁴ Outbreaks of HIV infection in prisons have been documented in several MENA countries.¹⁵ HIV incidence among IDUs in a detention center was found to be at very high levels of 16.8% per person per year, in a study in the Islamic Republic of Iran.¹⁶ HIV prevalence among prisoners in Sudan increased from 2% in 2002¹⁷ to 8.6% in 2006.¹⁸ Country surveillance reports of notified HIV/AIDS cases repeatedly document HIV infection among prisoners.¹⁹ High levels of

hepatitis C virus (HCV) prevalence, a proxy of IDU, of as much as 78% were found among prisoners in MENA, suggesting the prevalence of current or previous injecting drug use.²⁰

HIV prevalence among prisoners in select MENA countries can be found in table 9.1.²¹ Though overall HIV prevalence levels are lower than those found among prisoners in Latin America, South Asia, and sub-Saharan Africa,²² they are still substantial in several countries.

Imprisonment rates

Imprisonment rates in MENA are not as high as in some other regions, with some notable exceptions.²³ Table 9.1 shows imprisonment rates in several countries for which there are data.²⁴ The prison population in MENA appears to be dynamic. In the Islamic Republic of Iran, during the 2004–5 Persian fiscal year, there were on average 135,000 prisoners in 230 prisons, but 600,000 persons entered and exited prisons at this time.²⁵ The Islamic Republic of Iran has made efforts to reduce the prison population by 25% through a comprehensive approach including reducing the terms for drug-related charges, faster prosecution procedures, and alternative penalties to imprisonment for drug-related crimes, but still the rate is high at 185 per 100,000 persons.²⁶ About half of the prisoners in the Islamic Republic of Iran are first-time offenders and about half spend under 11 days incarcerated.²⁷

Risk behaviors and prisons

The risk and vulnerability factors cited for prisons in MENA include injecting and noninjecting drug use, tattooing, sharing of razors, unprotected

⁶ Dolan and Wodak, “HIV Transmission”; Bobrik et al., “Prison Health in Russia”; Taylor et al., “Outbreak of HIV Infection in a Scottish Prison.”

⁷ Dolan et al., “HIV in Prison.”

⁸ Ibid.

⁹ Dolan and Wodak, “HIV Transmission”; Pont et al., “HIV Epidemiology and Risk Behavior.”

¹⁰ Spaulding et al., “Human Immunodeficiency Virus.”

¹¹ Ibid.

¹² Bray and Marsden, “Drug Use in Metropolitan America.”

¹³ Mutter, Grimes, and Labarthe, “Evidence of Intraprison Spread of HIV.”

¹⁴ Spaulding et al., “Human Immunodeficiency Virus.”

¹⁵ Dolan et al., “HIV in Prison.”

¹⁶ Jahani et al., “HIV Seroconversion.”

¹⁷ Ahmed, *Prisoners*.

¹⁸ Assal, “HIV Prevalence.”

¹⁹ WHO/EMRO Regional Database on HIV/AIDS.

²⁰ Khani and Vakili, “Prevalence and Risk Factors of HIV”; Alizadeh et al., “Prevalence of Hepatitis C”; Nassirimanesh, “Proceedings of the Abstract”; Zali et al., “Anti-HCV Antibody among Iranian IV Drug Users”; Quinti et al., “Seroprevalence of HIV and HCV”; Afshar, “From the Assessment to the Implementation of Services”; Mutter, Grimes, and Labarthe, “Evidence of Intraprison Spread of HIV”; Javadi, Avijgan, and Hafizi, “Prevalence of HBV and HCV Infections.”

²¹ Dolan et al., “HIV in Prison.”

²² Ibid.

²³ Dolan et al., “HIV in Prison.”

²⁴ Dolan et al., “HIV in Prison”; International Centre for Prison Studies, *World Prison Brief Country Profiles*.

²⁵ Iran Prison Organization, “Health and Treatment Headquarter.”

²⁶ Burrows, Wodak, and WHO, *Harm Reduction in Iran*; S. Zamani personal communication (2008).

²⁷ Mostashari, UNODC, and Darabi, “Summary of the Iranian Situation on HIV Epidemic.”

Table 9.1 Imprisonment Rates and HIV Prevalence in Select MENA Countries

Country	Imprisonment (per 100,000)	HIV prevalence in prisons
Afghanistan	30 (International Centre for Prison Studies 2006)	
Algeria	158 (International Centre for Prison Studies 2006)	
Bahrain	95 (International Centre for Prison Studies 2006)	
Djibouti	61 (Dolan et al. 2007; International Centre for Prison Studies 2006)	6.1% (Shrestha 1999)
Egypt, Arab Republic of	About 121 (Dolan et al. 2007; International Centre for Prison Studies 2006)	0.0% (El-Ghazzawi, Hunsmann, and Schneider 1987) 0.0% (Egypt Ministry of Health and Population 2001) 1.6% (Quinti et al. 1995)
Iran, Islamic Republic of	191 (Dolan et al. 2007; International Centre for Prison Studies 2006) 185 (Burrows, Wodak, and WHO 2005)	2% (UNAIDS and WHO 2002; UNAIDS 2002) 1.4% (UNAIDS and WHO 2001) 2.3% (UNAIDS and WHO 2001) 12% (UNAIDS and WHO 2002) 2.1% (mostly IDUs; Afshar [unknown (a)]) 2.3% (mostly IDUs; Afshar [unknown (a)]) 3.3% (mostly IDUs; Afshar [unknown (a)]) 0.9% (injecting and noninjecting drug users; Alizadeh et al. 2005) 24.4% (IDUs; Jahani et al. 2009) 7.0% (IDUs; Rahbar, Rooholamini, and Khoshnood 2004) 22.0% (IDUs; Farhoudi et al. 2003) 24.0% (IDUs; Farhoudi et al. 2003) 12.0% (UNAIDS and WHO 2002) Up to 63.0% (UNAIDS 2002) 22–24% (Spaulding et al. 2002) 6% (Spaulding et al. 2002) 2.5% (Ghannad et al. 2009) 2.4% (Ghannad et al. 2009) 1.9% (Ghannad et al. 2009) 2.3% (Ghannad et al. 2009)
Iraq	About 60 (Dolan et al. 2007; International Centre for Prison Studies 2006)	0.0% (Shrestha 1999) 0.0% (Jordan National AIDS Program, personal communication)
Jordan	104 (International Centre for Prison Studies 2006)	0.0% (Jordan National AIDS Program, personal communication)
Kuwait	130 (International Centre for Prison Studies 2006)	
Lebanon	145 (Dolan et al. 2007; International Centre for Prison Studies 2006)	0.7% (Shrestha 1999) 0.16% (Mishwar 2008)
Libya	207 (Dolan et al. 2007; International Centre for Prison Studies 2006)	18.0% (Sammud 2005) 60.0% (detention for treatment; Dolan et al. 2007)

(continued)

Table 9.1 (Continued)

Country	Imprisonment (per 100,000)	HIV prevalence in prisons
Morocco	174 (Dolan et al. 2007; International Centre for Prison Studies 2006)	0.8% (Ministère de la Santé Maroc 2003–04) 0.7% (Elharti et al. 2002) 0.0% (women; Elharti et al. 2002) 2.0% (women; El Ghrari et al. 2007) 0.0% (women; Khattabi and Alami 2005) 0.72% (women; Khattabi and Alami 2005) 0.0% (women; Khattabi and Alami 2005) 1.2% (women; Khattabi and Alami 2005) 2.11% (women; Morocco MOH 2007) 0.9% (female prisoners imprisoned for sex work; Khattabi and Alami 2005) 0.70% (men; Khattabi and Alami 2005) 1.18% (men; Khattabi and Alami 2005) 0.80% (men; Khattabi and Alami 2005) 0.61% (men; Khattabi and Alami 2005) 0.53% (men; Morocco MOH 2007)
Oman	81 (Dolan et al. 2007; International Centre for Prison Studies 2006)	0.2% (Shrestha 1999) 0.14% (UNAIDS 2008)
Pakistan	55 (International Centre for Prison Studies 2006)	0.3% (Baqi et al. 1998) 1.1% (women; Baqi et al. 1998) 1.64% (Mujeeb and Hafeez 1993) 2.8% (Safdar, Mehmood, and Abbas 2009) 0.7% (Safdar, Mehmood, and Abbas 2009) 10% (Safdar, Mehmood, and Abbas 2009) 0.5% (Safdar, Mehmood, and Abbas 2009) 0.4% (Safdar, Mehmood, and Abbas 2009) 0.5% (Safdar, Mehmood, and Abbas 2009) 0.3% (Safdar, Mehmood, and Abbas 2009) 2.1% (Safdar, Mehmood, and Abbas 2009) 0.7% (Safdar, Mehmood, and Abbas 2009) 1.0% (Safdar, Mehmood, and Abbas 2009)
Qatar	55 (International Centre for Prison Studies 2006)	
Somalia		0.0% (Ahmed 1997)
Sudan	About 36 (International Centre for Prison Studies 2006)	0.0% (Burans et al. 1990) 2.0% (UNAIDS 2008) 8.63% (Assal 2006) 27.1% (women; Assal 2006)
Syrian Arab Republic	93 (Dolan et al. 2007; International Centre for Prison Studies 2006)	0–0.2% (Shrestha 1999)
Tunisia	253 (Dolan et al. 2007; International Centre for Prison Studies 2006)	0.0% (Shrestha 1999)
United Arab Emirates	288 (International Centre for Prison Studies 2006)	
Yemen, Republic of	83 (Dolan et al. 2007; International Centre for Prison Studies 2006)	26.5% (Shrestha 1999)

Note: Table adapted from Dolan et al. (2007). Data not available for empty cells.

sex, overcrowding, poor medical facilities, an unhealthy environment, inadequate awareness and education programs, and bullying.²⁸

Imprisonment as a risk factor for HIV infection

Several studies have documented the link between HIV infection and incarceration in MENA, mainly in the Islamic Republic of Iran. This link arises from the vulnerability of prisoners to risky practices such as using nonsterile drug-injecting equipment and having unprotected sex while in prison. HIV prevalence among repeat prisoners in the Islamic Republic of Iran was 22%–24%, which is much higher than that of first-time prisoners at 6%.²⁹ Among HIV and tuberculosis (TB) coinfecting persons in the Islamic Republic of Iran, 80% reported a history of imprisonment.³⁰ HIV infection was significantly associated with imprisonment and the use of nonsterile injecting equipment in prison in several studies in the Islamic Republic of Iran.³¹ Among PLHIV in the Islamic Republic of Iran, 74% reported a history of incarceration.³²

Drug use and incarceration

Ample evidence suggests a strong link between drug use and incarceration in MENA. Fifty-seven percent of IDUs in Afghanistan have been incarcerated, of whom 71.6% were incarcerated for drug-related offenses.³³ Forty-eight percent of prisoners in the Islamic Republic of Iran enter prison for drug-related crimes and 64% of them have a history of drug use.³⁴ In 2001, the Islamic Republic of Iran reported that more than 300,000 people were arrested on drug-related charges and 47% of the prison population was incarcerated for drug-related offenses.³⁵ Almost 64% (treatment centers) and 94% (community-based) of IDUs in the Islamic Republic of Iran reported a history of incarceration.³⁶ In further

studies in the Islamic Republic of Iran, 41%,³⁷ 75%,³⁸ and 74.3%³⁹ of IDUs reported being previously imprisoned, and 6% of prisoners reported starting drug injection while in prison.⁴⁰

Among prisoners in Lebanon, 12% reported a history of injecting drugs.⁴¹ Two percent of female prisoners in Morocco reported IDU.⁴² Between 61% and 83% of IDUs in Oman reported ever being arrested for drug-related offenses.⁴³ One-third of IDUs in one study in Pakistan have been incarcerated in the previous year,⁴⁴ and 14% and 40% of IDUs in two other settings reported a history of imprisonment.⁴⁵ Twenty-six percent of prisoners in Sudan reported drug use, of whom 8.4% injected drugs prior to incarceration.⁴⁶ In the Syrian Arab Republic, 55% of a group, half of which are IDUs, reported a history of imprisonment, and in 68% of the cases, the imprisonment was due to drug-related offenses.⁴⁷

Injecting drug use in prisons

Injecting drug use in prisons appears to be present in several MENA countries. Evidence for this practice in the Islamic Republic of Iran has been firmly established through multiple studies. Drugs are easily available in prisons, although five to eight times as expensive.⁴⁸ Between 27.6% and 53.6% of IDUs reported ever injecting drugs in prison,⁴⁹ and about 10% of prisoners are believed to inject drugs.⁵⁰ Fifty-two percent of inmates confirmed the occurrence of injections in prisons.⁵¹ One study found that one-third of IDUs

²⁸ Assal, "HIV Prevalence, Knowledge, Attitude, Practices, and Risk Factors among Prisoners in Khartoum State, Sudan."

²⁹ Spaulding et al., "Human Immunodeficiency Virus in Correctional Facilities."

³⁰ Tabarsi et al., "Clinical and Laboratory Profile."

³¹ Zamani et al., "Prevalence of and Factors Associated with HIV-1 Infection"; Zamani et al., "High Prevalence of HIV"; Kheirandish et al., "Prevalence and Correlates of Hepatitis C"; Zamani et al., "Shared Drug Injection inside Prison."

³² Ramezani, Mohraz, and Gachkar, "Epidemiologic Situation."

³³ Todd et al., "HIV, Hepatitis C, and Hepatitis B Infections."

³⁴ Afshar, "Health and Prison."

³⁵ UNODC, "Drug Situation in the I.R. of Iran."

³⁶ Zamani et al., "Shared Drug Injection inside Prison."

³⁷ Day et al., "Patterns of Drug Use."

³⁸ Razzaghi, Rahimi, and Hosseini, *Rapid Situation Assessment (RSA) of Drug Abuse*.

³⁹ Kheirandish et al., "Prevalence and Correlates of Hepatitis C."

⁴⁰ Farhoudi et al., "Human Immunodeficiency Virus and HIV-Associated Tuberculosis Infection."

⁴¹ Mishwar, "An Integrated Bio-Behavioral Surveillance Study."

⁴² El Ghrari et al., "Prevalence of Syphilis and HIV."

⁴³ Oman MOH, "HIV Risk among Heroin and Injecting Drug Users."

⁴⁴ Pakistan National AIDS Control Program, *National Study of Reproductive Tract*.

⁴⁵ Platt et al., "Prevalence of HIV, HCV, and Sexually Transmitted Infections."

⁴⁶ Ati, "HIV/AIDS/STIs Social and Geographical Mapping."

⁴⁷ Syria Mental Health Directorate, "Assessment of HIV Risk and Sero-Prevalence."

⁴⁸ Zamani, "Methadone Maintenance Treatment (MMT)."

⁴⁹ Farhoudi et al., "Human Immunodeficiency Virus and HIV-Associated Tuberculosis Infection."

⁵⁰ UNAIDS and WHO, *AIDS Epidemic Update 2002*.

⁵¹ Bolhari and Mirzamani, "Assessment of Substance Abuse in Iran's Prisons."

continue their drug use in prison,⁵² while another reported that 85% of IDUs used drugs in prison.⁵³ A study found that 28% of community-based IDUs with a history of incarceration have injected drugs in prisons,⁵⁴ and another reported that 9.7% of drug-using inmates continued to use drugs, mostly heroin, while in prison.⁵⁵

Also in the Islamic Republic of Iran, opioid use prevalence while in prison was found to be 30.7%, though 54.3% of inmates used drugs before incarceration, indicating a reduction in drug use during incarceration.⁵⁶ About 25%–30% of prisoners used drugs in prison in one study,⁵⁷ with another study indicating that about 30% of prisoners attempt to use drugs in prison and 17%–23% of prisoners use drugs by injection.⁵⁸ In further studies, 91% of IDUs and non-injecting drug users ever imprisoned reported using drugs while in prison,⁵⁹ and 18.9% and 6.1% reported using opioid and injecting drugs while in prison, respectively.⁶⁰

Other studies have also observed IDU in prisons in other MENA countries. In Algeria, 67% of those incarcerated reported using drugs in prison.⁶¹ In the Arab Republic of Egypt, about 25% of IDUs who had been incarcerated reported injecting drugs in prison.⁶² In Lebanon, only 0.16% of prisoners, including IDUs, reported injecting while in prison.⁶³ In Oman, 26%–44% of IDUs reported drug use in prison and 5%–11% reported injecting drugs in prison.⁶⁴ In Syria, 11% of imprisoned IDUs injected drugs in prison.⁶⁵

The prison environment is possibly compelling noninjecting drug users to inject while in

prison due to the difficulty of clandestine smoking and scarcity of raw opium.⁶⁶ The higher cost of obtaining drugs in prison has also been cited as a reason for injecting drugs because it is the most cost-effective method of using drugs.⁶⁷ Inmates find multiple ways of paying for drugs in prison, such as through family financial support, drug dealing, prison work, sex work, forcing their wives to do sex work, selling food and personal effects, gambling, credit, and extortion.⁶⁸

Use of nonsterile injecting equipment in prisons

Although predominantly from the Islamic Republic of Iran, evidence indicates the use of nonsterile injecting equipment in prisons. Studies in the Islamic Republic of Iran found, respectively, that 19%,⁶⁹ 29.9%,⁷⁰ and 37.1%⁷¹ of IDUs reported using nonsterile injection equipment in prison. In further studies in the Islamic Republic of Iran, 82% of those with a history of IDU in prison have injected drugs using nonsterile utensils,⁷² and 23% of community-based IDUs reported using nonsterile drug injection utensils in prison.⁷³ Twenty-three percent of prisoners in another study used drugs mostly with nonsterile and handmade utensils.⁷⁴

There is also evidence from other countries of using nonsterile injecting equipment in prisons. In Afghanistan, 30% of IDUs in prison reported using nonsterile needles or injection equipment.⁷⁵ In Oman, 3%–11% reported using nonsterile needles in prison.⁷⁶ In Sudan, 3.2% of prisoners reported using nonsterile syringes while in prison.⁷⁷ In Syria, the majority of IDUs who injected in prison did so by using a nonsterile syringe or a needle.⁷⁸

⁵² Ibid.

⁵³ Day et al., "Patterns of Drug Use."

⁵⁴ Zamani et al., "High Prevalence of HIV"; Zamani et al., "Shared Drug Injection inside Prison."

⁵⁵ Bolhari and Mirzamani, "Assessment of Substance Abuse in Iran's Prisons."

⁵⁶ Ibid.

⁵⁷ Mostashari, UNODC, and Darabi, "Summary of the Iranian Situation on HIV Epidemic."

⁵⁸ Afshar, "From the Assessment to the Implementation of Services"; Afshar, "Health and Prison."

⁵⁹ Day et al., "Patterns of Drug Use"; Zamani et al., "Needle and Syringe Sharing."

⁶⁰ Zamani et al., "Needle and Syringe Sharing."

⁶¹ Mimouni and Remaoun, "Etude du Lien Potentiel entre l'Usage Problématique de Drogues et le VIH/SIDA."

⁶² Elshimi, Warner-Smith, and Aon, "Blood-Borne Virus Risks."

⁶³ Mishwar, "An Integrated Bio-Behavioral Surveillance Study."

⁶⁴ Oman MOH, "HIV Risk among Heroin and Injecting Drug Users."

⁶⁵ Syria Mental Health Directorate, "Assessment of HIV Risk and Sero-Prevalence."

⁶⁶ Day et al., "Patterns of Drug Use"; Kheirandish et al., "Prevalence and Correlates of Hepatitis C."

⁶⁷ Zamani et al., "Shared Drug Injection inside Prison"; Zamani, "Methadone Maintenance Treatment (MMT)."

⁶⁸ S. Zamani, personal communication (2008); Bolhari and Mirzamani, "Assessment of Substance Abuse in Iran's Prisons."

⁶⁹ Day et al., "Patterns of Drug Use."

⁷⁰ Zamani et al., "Needle and Syringe Sharing."

⁷¹ Ibid.

⁷² Zamani et al., "High Prevalence of HIV."

⁷³ Zamani et al., "Shared Drug Injection inside Prison."

⁷⁴ Afshar, "Health and Prison."

⁷⁵ UNAIDS, "Notes on AIDS in the Middle East and North Africa."

⁷⁶ Oman MOH, "HIV Risk among Heroin and Injecting Drug Users."

⁷⁷ Assal, "HIV Prevalence."

⁷⁸ Syria Mental Health Directorate, "Assessment of HIV Risk and Sero-Prevalence."

This evidence of nonsterile injection equipment use in prison is further supported by the repeated confiscation of injecting equipment in MENA prisons.⁷⁹ Prison authorities could also be forcing prisoners to increase the use of nonsterile equipment by limiting their access to safe injecting utensils. In the Islamic Republic of Iran, incarcerated IDUs reported using nonsterile injecting equipment at a rate close to three times as high as the rate among nonincarcerated IDUs.⁸⁰ It has been reported that syringes are used at least 30 to 40 times in Iranian prisons before disposal.⁸¹

Tattooing is a risk factor for HIV infection,⁸² and there is evidence of tattooing using nonsterile utensils in Iranian prisons.⁸³ About 65% of imprisoned IDUs have tattoos,⁸⁴ and tattooing was reported by 24.9%–25.1% of Iranian prisoners.⁸⁵ Two studies in the Islamic Republic of Iran have also identified tattooing as a risk factor for HCV infection for incarcerated IDUs.⁸⁶

Sexual risk behavior and prisoners

Several studies have documented risky sexual behavior among prisoners in MENA. In the Islamic Republic of Iran, 17% of incarcerated drug users reported paying for drugs in prison through sex work,⁸⁷ and 5.4% of incarcerated male IDUs reported sex with another male while in prison.⁸⁸ Sexual abuse of prisoners by other prisoners has also been reported in the Islamic Republic of Iran.⁸⁹ In Lebanon, 2.6% of male prisoners reported anal sex with another male while in prison.⁹⁰ In Oman, 6%–18% of male IDUs reported having sex in prison without condoms.⁹¹ In Pakistan, 4% of male prisoners

reported having sex with other males.⁹² In Sudan, 1.4% of male prisoners reported having sex with other males in one prison, but social workers in this prison estimated that about 20% of prisoners engage in such activity.⁹³ The latter assertion is corroborated by the fact that 14.5% of prisoners have been diagnosed with gonorrhea while incarcerated.⁹⁴ In Syria, 5% of imprisoned drug users reported ever having sex in prison.⁹⁵

Anecdotal evidence in Sudan suggests the occurrence of sexual acts between female prisoners and their guards in exchange for better treatment in prison.⁹⁶ Prisoners also generally report higher levels of sexual risk behavior than the rest of the general population even prior to incarceration. In Morocco, only 9% of female prisoners reported using condoms and the average number of lifetime sexual partners was 5.17.⁹⁷ In Sudan, only 4% of male prisoners reported ever using a condom, 41.9% reported premarital and extramarital sex, and 8.6% had paid for sex.⁹⁸ Also in Sudan among male prisoners, 23.7%, 2.8%, 4.7%, and 17.7% reported having one, two, three, and more than three lifetime sexual partners, respectively; 11.4% reported having sex before marriage; and 2.2% reported having sex with another male.⁹⁹ Another study in Sudan found that 65.2% of prisoners had extramarital relations prior to incarceration.¹⁰⁰ Though by law prisoners in Sudan have the right to conjugal visits, this right is rarely practiced.¹⁰¹

Analytical summary

Prisoners are a large share of the population vulnerable to HIV in MENA. History of imprisonment was demonstrated to be linked to higher risk of HIV infection in the Islamic Republic of Iran and may have contributed to the HIV epidemics in other countries. High HIV prevalence levels and HIV outbreaks have been documented among prisoners in MENA. High levels of injecting

⁷⁹ Bolhari and Mirzamani, "Assessment of Substance Abuse in Iran's Prisons."

⁸⁰ Rahbar, Rooholamini, and Khoshnood, "Prevalence of HIV Infection."

⁸¹ Nassirimanesh, Trace, and Roberts, "The Rise of Harm Reduction."

⁸² Martin et al., "Predictive Factors of HIV-Infection"; Buavirat et al., "Risk of Prevalent HIV."

⁸³ Zamani et al., "High Prevalence of HIV."

⁸⁴ Afshar, "From the Assessment to the Implementation of Services."

⁸⁵ Farhoudi et al., "Human Immunodeficiency Virus."

⁸⁶ Khani and Vakili, "Prevalence and Risk Factors of HIV"; Kheirandish et al., "Prevalence and Correlates of Hepatitis C Infection."

⁸⁷ Bolhari and Mirzamani, "Assessment of Substance Abuse in Iran's Prisons."

⁸⁸ Zamani et al., "Needle and Syringe Sharing Practices."

⁸⁹ Afshar, "From the Assessment to the Implementation of Services."

⁹⁰ Mishwar, "An Integrated Bio-Behavioral Surveillance Study."

⁹¹ Oman MOH, "HIV Risk among Heroin and Injecting Drug Users."

⁹² Khawaja et al., "HIV/AIDS and Its Risk Factors in Pakistan."

⁹³ Ati, "HIV/AIDS/STIs Social and Geographical Mapping."

⁹⁴ Ibid.

⁹⁵ Syria Mental Health Directorate, "Assessment of HIV Risk and Sero-Prevalence."

⁹⁶ Ati, "HIV/AIDS/STIs Social and Geographical Mapping."

⁹⁷ El Ghrari et al., "Prevalence of Syphilis and HIV."

⁹⁸ Ahmed, *Prisoners*.

⁹⁹ Assal, "HIV Prevalence."

¹⁰⁰ Ati, "HIV/AIDS/STIs Social and Geographical Mapping."

¹⁰¹ Assal, "HIV Prevalence."

drug and sexual risk behaviors have also been observed in MENA prisons.

Prevention efforts are needed to combat HIV infection in prisons; the Islamic Republic of Iran provides an example of what can be achieved in the MENA context by incorporating effective harm reduction in prisons.¹⁰²

YOUTH AND HIV

MENA is distinctively characterized by a “tidal wave” of youth; one-fifth of the population, 95 million people,¹⁰³ are in the 15–24 years age group,¹⁰⁴ the average age range of initiation of sexual activities.¹⁰⁵ This is the largest youth cohort in the region’s history and the largest vulnerable population in MENA.¹⁰⁶

Youth are experiencing high rates of unemployment, delayed marital age, increased premarital sex, conflict morbidity and mortality, increased mobility, peer pressure to engage in risky behavior, and changing lifestyle norms.¹⁰⁷ The increasing high educational attainment of youth, coupled with high unemployment, is leading to a structural vulnerability of rising expectations but declining opportunities.¹⁰⁸ There is a widening generation gap between young people on one hand, and their parents and decision makers on the other hand.¹⁰⁹

Youth play a central role in the HIV epidemic. About half of all HIV infections in sub-Saharan Africa, Eastern Europe, and Central Asia are among those younger than 25 years of age.¹¹⁰ In most regions, most IDUs, men who have sex with men (MSM), and female sex workers (FSWs) and their clients are young, or if older, they would have started at-risk behavior at

a young age.¹¹¹ Young people bridge HIV infection between different population groups, such as young, sexually active IDUs exchanging sex for money with MSM and exchanging money for sex with FSWs.¹¹² Young people are also the best vehicle for change if they can be reached with appropriate interventions.¹¹³ The countries that reported the largest declines in risky behavior and HIV prevalence, such as Uganda, observed the biggest changes among youth.¹¹⁴

Demography

The share of youth 15–24 years of age ranges between 15% and 25% among the countries of the region.¹¹⁵ In Egypt and Morocco, about one-third of the population is between 15 and 29 years of age.¹¹⁶ In Jordan, 70% of the population is below the age of 25.¹¹⁷ In the West Bank and Gaza, 52% of the population is below the age of 18.¹¹⁸ In Sudan, 45% of the population is under the age of 15.¹¹⁹ In the Republic of Yemen, 46.2% of the population is below age 15 and 58.3% is below age 19.¹²⁰

Though the demographic transition is progressing rapidly and fertility has been in sharp decline in much of the region in recent years, with several countries being even below the replacement level,¹²¹ youth will continue to be the largest vulnerable population as well as the population that has the greatest potential to drive the socioeconomic dynamics in the region.¹²² Regrettably, this region as a whole is largely failing to take advantage of this “demographic bonus” by using this window of opportunity for economic growth. MENA youth today are the first generation of young people in recent history that are unlikely to fare better than their parents, despite having higher educational levels than their parents.¹²³

¹⁰² Zamani et al., “Prevalence of and Factors Associated with HIV-1 Infection”; Ministry of Health and Medical Education of Iran, “Treatment and Medical Education”; Afshar, “From the Assessment to the Implementation of Services”; Afshar and Kasraee, “HIV Prevention Experiences.”

¹⁰³ Assaad and Roudi-Fahimi, “Youth in the Middle East and North Africa.”
¹⁰⁴ UNAIDS, “Notes on AIDS in the Middle East and North Africa”; Roudi-Fahimi and Ashford, “Sexual & Reproductive Health.”

¹⁰⁵ Roudi-Fahimi and Ashford, “Sexual & Reproductive Health”; UNAIDS, *Report on the Global AIDS Epidemic*.

¹⁰⁶ Assaad and Roudi-Fahimi, “Youth in the Middle East and North Africa.”

¹⁰⁷ Busulwa, “HIV/AIDS Situation Analysis Study”; UNAIDS, “Notes on AIDS in the Middle East and North Africa.”

¹⁰⁸ Jenkins and Robalino, “HIV in the Middle East and North Africa.”

¹⁰⁹ Assaad and Roudi-Fahimi, “Youth in the Middle East and North Africa.”

¹¹⁰ Monasch and Mahy, “Young People.”

¹¹¹ Ibid.

¹¹² Michael, Ahmed, and Lemma, “HIV/AIDS Behavioral Surveillance Survey.”

¹¹³ Monasch and Mahy, “Young People.”

¹¹⁴ Ibid.

¹¹⁵ Assaad and Roudi-Fahimi, “Youth in the Middle East and North Africa.”

¹¹⁶ Jenkins and Robalino, “HIV in the Middle East and North Africa.”

¹¹⁷ UNAIDS, “HIV Prevention in Jordan.”

¹¹⁸ UNAIDS, “Key Findings on HIV Status.”

¹¹⁹ Gutbi and Eldin, “Women Tea-Sellers in Khartoum and HIV/AIDS.”

¹²⁰ Lambert, “HIV and Development Challenges in Yemen.”

¹²¹ Rashad, “Demographic Transition in Arab Countries.”

¹²² Assaad and Roudi-Fahimi, “Youth in the Middle East and North Africa.”

¹²³ Rashad, Osman, and Roudi-Fahimi, *Marriage in the Arab World*.

Unemployment

The region has the highest youth unemployment rate of all regions at 26%,¹²⁴ twice that of South Asia. About 43 million youth are expected to enter the labor force between 2000 and 2010, compared with 47 million who entered the labor market during the four decades from 1950 to 1990.¹²⁵ Three-quarters of those unemployed in a country, such as Syria, are youth.¹²⁶ The unemployment rate in the West Bank and Gaza is at 26.8%, and most of those unemployed are young adults.¹²⁷ Among rural youth in Sudan, 63.5% were found unemployed.¹²⁸ The high unemployment among youth has left young people with ample spare time to spend in cafés and entertainment centers, thereby potentially exposing them to pressures for risky behaviors.

Marriage

The rising costs of marriage are a large barrier toward marriage in the region.¹²⁹ High dowries have made it difficult if not impossible for youth to marry, thereby preventing them from having the opportunity for sanctioned sex.¹³⁰ It is not uncommon for families to spend as much as 15 times the annual household expenditure per capita on marriage-related costs.¹³¹ Consumerism and rising expectations have contributed substantially to the rising cost of marriage.¹³² The difficulties facing youth in marriage may have contributed to the large gap in age between spouses: 25% of recent marriages in Egypt and Lebanon included a husband at least 10 years older than his wife.¹³³ Also, more and more people are adopting modern lifestyles and delaying marriage for education or work outside the home.¹³⁴

The gap between biological adulthood and marriage is conducive to premarital sex.¹³⁵ Studies have shown that paying for sex is higher among

never married or formerly married men.¹³⁶ The age of marriage is steadily rising in MENA.¹³⁷ In more than a third of MENA countries, the average age at first marriage has increased between 4.7 and 7.7 years over a span of 20 years.¹³⁸ In the Islamic Republic of Iran, it increased from 19.8 years for females and 23.6 years for males in 1986 to 22.4 years and 25.6 years in 1996, respectively.¹³⁹ In Jordan, the average marriage age increased for females from 19.6 years in 1990 to 21.8 years in 2002.¹⁴⁰ In Lebanon, the average marriage age is 30.9 years for males and 27.5 years for females,¹⁴¹ and has increased by 3.9 years from 1989 to 1996.¹⁴² In Saudi Arabia, the average marriage age has increased from 18.22 to 19.90 years over 20 years.¹⁴³ In Tunisia, the average marriage age is at 33 years for men and 29 years for women.¹⁴⁴

MENA is experiencing the phenomenon of marriage squeeze, defined as an imbalance between the numbers of males and females in the prime age for marriage.¹⁴⁵ Marriage squeeze has been documented in Lebanon among both Lebanese and Palestinian refugees, where it is forcing many to delay or forego marriage.¹⁴⁶ Marriage squeeze also seems to be occurring in many other countries around MENA because the mate availability ratios are distorted by demographic stresses driven by delayed age at marriage, high male migration, and conflict-related morbidity and mortality.¹⁴⁷

The large cohort of single young women is a recent phenomenon in MENA.¹⁴⁸ By 1990, the proportion of women in the sexually active population of 15–49 years of age who are not currently married has reached between 24% and 46% in most countries.¹⁴⁹ Between 7% and

¹²⁴ Assaad and Roudi-Fahimi, "Youth in the Middle East and North Africa."

¹²⁵ Ibid.

¹²⁶ Ibid.

¹²⁷ UNAIDS, "Key Findings on HIV Status in the West Bank and Gaza."

¹²⁸ SNAP, UNICEF, and UNAIDS, "Baseline Study on Knowledge."

¹²⁹ Rashad et al., *Marriage in the Arab World*.

¹³⁰ Busulwa, "HIV/AIDS Situation Analysis Study."

¹³¹ Rashad et al., *Marriage in the Arab World*.

¹³² Ibid.

¹³³ Ibid.

¹³⁴ Roudi-Fahimi and Ashford, "Sexual & Reproductive Health."

¹³⁵ DeJong et al., "The Sexual and Reproductive Health of Young People."

¹³⁶ Carael, Cleland, and Adeokun, "Overview"; Carael, "Urban-Rural Differentials."

¹³⁷ Rashad and Osman, "Nuptiality in Arab Countries"; Fargues, "Terminating Marriage."

¹³⁸ Rashad, "Demographic Transition in Arab Countries."

¹³⁹ Mohammadi et al., "Reproductive Knowledge, Attitudes and Behavior."

¹⁴⁰ Naffa, "Jordanian Women: Past and Present."

¹⁴¹ El-Kak et al., "High School Students in Postwar Lebanon."

¹⁴² Saxena, Kulczycki, and Jurdi, "Nuptiality Transition."

¹⁴³ Babay et al., "Age at Menarche."

¹⁴⁴ Fargues, "Terminating Marriage."

¹⁴⁵ Akers, "On Measuring the Marriage Squeeze"; Schoen, "Measuring the Tightness of a Marriage Squeeze."

¹⁴⁶ Saxena, Kulczycki, and Jurdi, "Nuptiality Transition."

¹⁴⁷ Ibid.

¹⁴⁸ DeJong et al., "The Sexual and Reproductive Health of Young People."

¹⁴⁹ Rashad, "Demographic Transition in Arab Countries."

21% of women in MENA are not married by age 30–39.¹⁵⁰ In nearly half of the countries, women spend about one-third of their sexual activity lifespan (15–49 years of age) in an unmarried state.¹⁵¹ In Lebanon, about one out of five men and women aged 35–39 years was still single in 1996.¹⁵² In Algeria, Jordan, Kuwait, Lebanon, Libya, Morocco, Qatar, Syria, Tunisia, and the West Bank and Gaza, between 10% and 25% of women are never married.¹⁵³ Even in a highly traditional and underdeveloped country such as the Republic of Yemen, marriage among women 15–19 years old declined from 27% to 17% between 1997 and 2003.¹⁵⁴

Early and near universal marriage, where almost all adults spend most of their sexual activity lifetime being married, was once the highlight of this region. Yet, it will soon become the exception rather than the norm.¹⁵⁵ In large part, the demographic transition in MENA is driven by stark changes in nuptiality.¹⁵⁶

Youth and priority populations

Youth contribute disproportionately to the priority populations in MENA, attesting to the vulnerability of this population group. Being an unemployed youth is a frequent characteristic of IDUs.¹⁵⁷ Drug use in different forms appears to be considerable and probably increasing among youth in MENA.¹⁵⁸ The profile of IDUs in a Tunisian study was that of young men raised in large families shattered by urban-rural migration.¹⁵⁹ Among young prisoners in the Islamic Republic of Iran, 33.9% of inmates used opioid while in prison.¹⁶⁰ IDUs in Oman reported hashish as their first drug at a mean age of 18, and then IDU of heroin at age 22.¹⁶¹

The largest burden of drug use in the West Bank and Gaza is in the 31–40 years age group, with a notable increase in drug use among

youth.¹⁶² Among high school students, marijuana was used by 2%–2.9% of males and 0.7%–1% of females, and heroin was used by 0.8%–1% of males and 0.4%–0.6% of females.¹⁶³ The average age at first use of different forms of drugs ranged between 12.8 and 14.75 years for males and 12 and 16 years for females.¹⁶⁴ Peer pressure was found to be a key determinant of starting drug use among these adolescents.¹⁶⁵ The knowledge of harm was generally poor and multiple use of different drugs was reported by a considerable share of these users.¹⁶⁶

The lack of engagement in meaningful activities is conducive to risky behavior in MENA. Of high school students in the West Bank and Gaza, 38.2% of males and 5.2% of females spend evenings hanging in streets, and among heroin users, these percentages were 66.7% for males and 42.9% for females.¹⁶⁷

For MSM, more than half of the participants in a study in Sudan (60.1%) were between 15 and 24 years of age, and 85.5% of them had their first anal experience between the ages of 15 and 25.¹⁶⁸ MSM tend to start having sex at a younger age compared to males who have sex with females.¹⁶⁹ In Lebanon, 54% of MSM reported having their first anal sex at under the age of 18 years.¹⁷⁰ In Egypt, young MSM were the group that changed their sexual partners most often among MSM.¹⁷¹ Also in Egypt, young MSM were found to be the most sexually active, with a frequency of sexual acts greater than one per day.¹⁷² In studies in Pakistan, male sex workers (MSWs) had an average age of 22.3,¹⁷³ 21.3,¹⁷⁴ and 21.7¹⁷⁵ years, and started

¹⁵⁰ Ibid.

¹⁵¹ Ibid.

¹⁵² Saxena, Kulczykcki, and Jurdi, "Nuptiality Transition."

¹⁵³ Roudi-Fahimi and Ashford, "Sexual & Reproductive Health."

¹⁵⁴ Ibid.

¹⁵⁵ Rashad, "Demographic Transition in Arab Countries."

¹⁵⁶ Ibid.

¹⁵⁷ Zamani et al., "High Prevalence of HIV."

¹⁵⁸ Ibid.

¹⁵⁹ Tiouiri et al., "Study of Psychosocial Factors."

¹⁶⁰ Bolhari and Mirzamani, "Assessment of Substance Abuse in Iran's Prisons."

¹⁶¹ Oman MOH, "HIV Risk among Heroin and Injecting Drug Users."

¹⁶² Shareef et al., "Drug Abuse Situation."

¹⁶³ Afifi and El-Sousi, "Drug Abuse and Related Behaviors."

¹⁶⁴ Ibid.

¹⁶⁵ Ibid.

¹⁶⁶ Ibid.

¹⁶⁷ Ibid.

¹⁶⁸ Elrashied, "Generating Strategic Information."

¹⁶⁹ Monasch and Mahy, "Young People."

¹⁷⁰ Mishwar, "An Integrated Bio-Behavioral Surveillance Study."

¹⁷¹ El-Rahman, "Risky Behaviours for HIV/AIDS Infection."

¹⁷² El-Sayyed, Kabbash, and El-Gueniedy, "Risk Behaviours for HIV/AIDS Infection."

¹⁷³ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹⁷⁴ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹⁷⁵ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

commercial sex at an average age of 16.9,¹⁷⁶ 15.9,¹⁷⁷ and 16.2¹⁷⁸ years, respectively.

As for FSWs, 71.4% of FSWs in one study in Sudan were below 30 years of age, including 8.4% who were under 18 years of age.¹⁷⁹ Further studies among FSWs in Sudan have found that the majority are under 30 years of age,¹⁸⁰ 19.6% are less than 18 years of age,¹⁸¹ and the majority are younger than 28 years and started sex work before 22 years of age.¹⁸² Fifty-three percent of FSWs in a study in Syria were 25 years of age or younger.¹⁸³ In Djibouti, 63% of FSWs reported their first commercial sex at under 20 years of age.¹⁸⁴ In Lebanon, 57% of FSWs reported first sex at ages between 11 and 18 years.¹⁸⁵ In Pakistan, young FSWs were found to have the highest client volume.¹⁸⁶ Also in Pakistan, the median age of initiating sex work was reported to be 22 years of age.¹⁸⁷

Youth and STIs

Youth contribute disproportionately to the disease burden of STIs in MENA. Fifty-nine percent of sexually transmitted disease (STD) cases in Egypt were among young and predominantly single adults.¹⁸⁸ Almost 41% of HIV infections in the Islamic Republic of Iran are found in the 25–34 years age group,¹⁸⁹ and 27.9% of youth report a previous history of STDs.¹⁹⁰ Almost half (45%) of reported STD cases in the Islamic Republic of Iran occurred in the 20–29 years age group, and 10% of all cases involved

teenagers.¹⁹¹ Most reported STDs among STD clinic attendees in Kuwait were in the age range of 21–30 years.¹⁹² The age group most affected by HIV in Jordan is the 15–35 years age group.¹⁹³

The majority of reported HIV/AIDS cases in the West Bank and Gaza are in the 20–40 years age group, with 31% among the 20–29 years age group.¹⁹⁴ Women under 25 years of age in Oman were twice as likely to acquire an STI compared to women older than 25 years of age.¹⁹⁵ Forty percent of recorded STD cases in Morocco were among youth ages 15–29 years.¹⁹⁶ Most HIV infections in Morocco (63%) and Tunisia (93%) are among single and often young persons.¹⁹⁷

The highest prevalence of both HIV and syphilis in Somalia (4%) was in the 15–24 years age group.¹⁹⁸ Forty-seven percent of HIV cases in the ANC HIV sentinel sero-survey in Sudan were in the 20–24 years age group.¹⁹⁹ Also in Sudan, HIV prevalence among youth is estimated to be 1% among females and 0.3% among males.²⁰⁰ The dominant profile of STD clinic attendees in Tunisia was that of young single men with multiple sexual partners.²⁰¹

Sexual behavior among youth

Despite data limitations, several studies have documented the nature of sexual behavior among youth in MENA. The outcomes of behavioral surveys show substantial variability within the region.

In Afghanistan, 14.6% of university students were sexually active, with risk behaviors more prevalent among males than females.²⁰² In Djibouti, 22% of high school students reported

¹⁷⁶ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹⁷⁷ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹⁷⁸ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round III).

¹⁷⁹ Ati, "HIV/AIDS/STIs Social and Geographical Mapping."

¹⁸⁰ ACORD, "Socio Economic Research on HIV/AIDS Prevention."

¹⁸¹ Yousif, *Health Education Programme*.

¹⁸² ACORD, "Qualitative Socio Economic Research."

¹⁸³ Syria National AIDS Programme, "HIV/AIDS Female Sex Workers KABP Survey in Syria."

¹⁸⁴ Michael, Ahmed, and Lemma, "HIV/AIDS Behavioral Surveillance Survey."

¹⁸⁵ Mishwar, "An Integrated Bio-Behavioral Surveillance Study."

¹⁸⁶ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round I).

¹⁸⁷ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Round II).

¹⁸⁸ Ali et al., "Prevalence of Certain Sexually Transmitted Diseases in Egypt."

¹⁸⁹ Iran Center for Disease Management, *Country Report on UNGASS*.

¹⁹⁰ Tehrani and Malek-Afzalip, "Knowledge, Attitudes and Practices concerning HIV/AIDS."

¹⁹¹ Iran Center for Disease Management, Three Month Statistics of the MoH AIDS Office.

¹⁹² Al-Mutairi et al., "Clinical Patterns."

¹⁹³ Anonymous, *Scaling Up the HIV Response*.

¹⁹⁴ UNAIDS, "Key Findings on HIV Status."

¹⁹⁵ Roudi-Fahimi and Ashford, "Sexual & Reproductive Health."

¹⁹⁶ Roudi-Fahimi and Ashford, "Sexual & Reproductive Health"; Jenkins and Robalino, "HIV in the Middle East and North Africa."

¹⁹⁷ Jenkins and Robalino, "HIV in the Middle East and North Africa."

¹⁹⁸ WHO, *The 2004 First National Second Generation HIV/AIDS/STI Sentinel Surveillance Survey*.

¹⁹⁹ Sudan National AIDS/STIs Program, *2007 ANC HIV Sentinel Sero-Survey*.

²⁰⁰ SNAP, "Update on the HIV Situation in Sudan."

²⁰¹ Sellami et al., "Epidemiologic Profile."

²⁰² Mansoor et al., "Gender Differences in KAP."

being sexually active (40.8% of males and 2.7% of females).²⁰³ Another study in Djibouti reported that 71% of young males and females reported sexual relations without defining the kind of relations, and 39% reported ever using condoms.²⁰⁴

In Egypt, 26% of male and 3% of female university students reported having sexual intercourse.²⁰⁵ In another study, 16.5% of university students engaged in sexual intercourse,²⁰⁶ and in a third, 18% of the students reported engaging in risky sexual behavior.²⁰⁷ Low condom use was reported among university students.²⁰⁸

In the Islamic Republic of Iran, 12.4% of young males reported premarital or extramarital sex in one study,²⁰⁹ and in a second study, 28% of males aged 15–18 years reported sexual experience, with 73% of them having more than one lifetime sexual partner.²¹⁰ Condom nonuse was associated with poor access to the Internet (reflecting poorer knowledge), feeling regretful at first sex, and one lifetime sexual partner.²¹¹ Meanwhile, multiple sexual partnerships were associated with alcohol consumption, older ages, and poor knowledge of reproductive physiology.²¹² Close to half of the adolescents in this sample were unfamiliar with condoms and their protective effect against STIs, including HIV.²¹³ Eight percent of college students (16% of males and 0.6% of females) reported having sexual intercourse before marriage and 48% had used condoms.²¹⁴ Yet another study of adolescents found that 47% were not aware that condoms protect against HIV infection.²¹⁵ Finally, from the Islamic Republic of Iran, a study of college students reported that 20% of the respondents had a history of sexual contact.²¹⁶

In Jordan, a survey of youth found casual sex to be rare and condom use to be moderately high among those who engaged in nonmarital sex.²¹⁷ Another study reported that 7% of college students and 4% of the general population in the 15–30 years age range admitted to engaging in nonmarital sex.²¹⁸ About 90% of the youth who reported sexual partnerships reported opposite sex partners only, while 10% reported sex with the same sex or both sexes.²¹⁹ About 10% of the youth reported nonmarital sexual contacts in the last year.²²⁰

In Lebanon, behavioral surveys suggest increased risky behavior among youth.²²¹ About 50% of young conscripts reported any lifetime heterosexual experience and about 50% reported consistent condom use.²²² In Mauritania, 40% of male school students reported sexual activity, with 41% of them reporting multiple sexual partnerships and 38% reporting unprotected sexual intercourse.²²³ In Pakistan, 80% of young men masturbated and 94% had experienced nocturnal emissions.²²⁴

In Somalia, 7% of youth acknowledged sexual activity in the last year, 17.8% reported that they had ever had sex, and only 6.5% of them used a condom during the most recent sexual activity.²²⁵ About 23% of women under age 24 had knowledge of condoms.²²⁶

In Sudan, 6.9% of university students reported having sex and 5.5% engaged in premarital sex.²²⁷ Almost half (48.6%) of sexually active students had one sexual partner, 14.5% had two partners, 10.9% had three partners, and 23.2% had more than three partners.²²⁸ In another study of university students, 6.2% reported ever using a condom, and 14.4% reported extramarital sex.²²⁹ In a study of youth, 0.6% reported condom use, 2% reported

²⁰³ Rodier et al., "HIV Infection among Secondary School Students."

²⁰⁴ Ministère de la Santé-PNLS et al., "Etude des connaissances attitudes-pratiques des jeunes."

²⁰⁵ El-Zanaty and El-Daw, "Behavior Research."

²⁰⁶ NAMRU-3, "Young People and HIV/AIDS."

²⁰⁷ Refaat, "Practice and Awareness of Health Risk Behaviour."

²⁰⁸ Ibid.

²⁰⁹ Tehrani and Malek-Afzalip, "Knowledge, Attitudes and Practices concerning HIV/AIDS."

²¹⁰ Mohammadi et al., "Sexual Risk-Taking Behaviors"; Mohammadi et al., "Reproductive Knowledge, Attitudes and Behavior."

²¹¹ Mohammad et al., "Sexual Risk-Taking Behaviors."

²¹² Ibid.

²¹³ Mohammadi et al., "Reproductive Knowledge, Attitudes and Behavior."

²¹⁴ Simbar, Tehrani, and Hashemi, "Reproductive Health Knowledge."

²¹⁵ Yazdi et al., "Knowledge, Attitudes and Sources of Information."

²¹⁶ Shirazi and Morowatisharifabad, "Religiosity and Determinants of Safe Sex."

²¹⁷ UNAIDS and WHO, *AIDS Epidemic Update 2005*.

²¹⁸ Johns Hopkins University, "Youth Survey."

²¹⁹ Jenkins and Robalino, "HIV in the Middle East and North Africa."

²²⁰ Jordan National AIDS Control Programme, *Report on the National KABP Survey (2005)*.

²²¹ Kassak et al., "Final Working Protocol."

²²² Adib et al., "Heterosexual Awareness and Practices."

²²³ Ndiaye et al., "Evaluation of Condom Use."

²²⁴ Qidwai, "Sexual Knowledge."

²²⁵ WHO/EMRO, "Presentation of WHO Somalia's Experience."

²²⁶ Population Studies Research Institute, "Baseline Survey."

²²⁷ Sudan National HIV/AIDS Control Program, *HIV/AIDS/STIs Prevalence*.

²²⁸ Ibid.

²²⁹ Ahmed, *University Students*.

condom use with commercial sex workers (CSWs), and 9.5% reported nonregular partners in the last year.²³⁰

While not part of this report's definition of the MENA region, 19% of college students in Turkey reported having had sexual intercourse and 30% reported using a condom during the last sex.²³¹ In another study, 61.2% of males and 18.3% of females reported sexual intercourse among final-year university students aged 20–25 years.²³² In a third study, 36.6% of college students were sexually active, with males being more sexually active than females, but using condoms less frequently.²³³ In a fourth study, 46% of male adolescents and 3% of female adolescents had sexual intercourse.²³⁴ The median age at first intercourse was 17 years for males and 16 years for females.²³⁵ Among those who had intercourse, 44% of the males and 67% of the females had their first experience with their lovers.²³⁶ The rates of sexual activity among high school students were found in yet another study to be much higher among males compared to females, with generally low condom use.²³⁷ Also among high school students, the percentage of people who reported having sexual experiences increased from 11.3% in 1997 to 22.8% in 2004.²³⁸

Other issues related to sexual behavior of youth

The rapid cultural and socioeconomic transformation in MENA is particularly affecting youth, who are experiencing enormous strains with the rapid social changes, urbanization, and generation gap induced in part by mass education. Among youth who have lived abroad, higher levels of sexual intercourse have been reported, suggesting the influence of cultural exchanges on sexual behavior.²³⁹ Youth emigration is prevalent in MENA, and in Lebanon, a third of the population emigrated for at least some time during the civil war.²⁴⁰ Students in Lebanon are increasingly

found to embrace Western values, associated with liberal attitudes toward sexuality,²⁴¹ rather than traditional values, and appear to have relaxed attitudes toward sexuality.²⁴²

Youth in MENA do not seem to be concerned about HIV infection. Only 14.2% in Iran²⁴³ and 20% in Djibouti²⁴⁴ reported concern about HIV infection. Furthermore, the lack of meaningful engagements among youth, coupled with the availability of financial resources, appears to lead to riskier behaviors. A higher allowance in Egypt has been associated with risky sexual behavior among youth.²⁴⁵ There are no satisfactory data that clarify the engagement of youth in nonconventional forms of marriage,²⁴⁶ but there is evidence of significantly higher approval of such marriage forms among youth compared to older age groups.²⁴⁷ More than a quarter of Iranian youth approve of temporary marriages.²⁴⁸

Reproductive knowledge among youth, specifically in the Islamic Republic of Iran, has been associated with lower sexual risk behavior and increased condom use,²⁴⁹ just as in other regions.²⁵⁰ This highlights the utility of increasing HIV knowledge among youth. Only the Islamic Republic of Iran and Tunisia have national programs on young people's sexual and reproductive health.²⁵¹ Some young populations in the Islamic Republic of Iran appear to have higher levels of knowledge than even priority populations. Youth in the Islamic Republic of Iran were found to be more knowledgeable about HIV and prevention measures than FSWs and truck drivers.²⁵²

The limited behavioral evidence among youth should be interpreted with caution. Considering cultural barriers, youth are not often asked specifically about the kind of sexual contacts they engage in and therefore their responses

²³⁰ Sudan National AIDS Control Program, *Situation Analysis*.

²³¹ Ugan and Yaman, "AIDS Knowledge and Educational Needs."

²³² Aras et al., "Sexual Behaviours and Contraception."

²³³ Gokengin et al., "Sexual Knowledge."

²³⁴ Dagdeviren, Set, and Akturk, "Sexual Activity among Turkish Adolescents."

²³⁵ *Ibid.*

²³⁶ *Ibid.*

²³⁷ Aras et al., "Sexual Attitudes and Risk-Taking Behaviors."

²³⁸ Yamazhan et al., "Attitudes towards HIV/AIDS."

²³⁹ El-Kak et al., "High School Students in Postwar Lebanon."

²⁴⁰ *Ibid.*

²⁴¹ Sigusch, "The Neosexual Revolution."

²⁴² El-Kak et al., "High School Students in Postwar Lebanon."

²⁴³ Tehrani and Malek-Afzalip, "Knowledge, Attitudes and Practices concerning HIV/AIDS."

²⁴⁴ Rodier et al., "HIV Infection among Secondary School Students."

²⁴⁵ Refaat, "Practice and Awareness of Health Risk Behaviour."

²⁴⁶ Haeri, "Temporary Marriage."

²⁴⁷ Mohammad et al., "Sexual Risk-Taking Behaviors."

²⁴⁸ Tehrani and Malek-Afzalip, "Knowledge, Attitudes and Practices concerning HIV/AIDS."

²⁴⁹ Mohammad et al., "Sexual Risk-Taking Behaviors."

²⁵⁰ Rock, Ireland, and Resnick, "To Know That We Know What We Know."

²⁵¹ DeJong et al., "The Sexual and Reproductive Health of Young People."

²⁵² Tehrani and Malek-Afzalip, "Knowledge, Attitudes and Practices concerning HIV/AIDS."

may include nonpenetrative sexual activities, which are less of a concern in relation to HIV.²⁵³ Though 28% of males aged 15–18 years reported sexual experiences in the Islamic Republic of Iran,²⁵⁴ this sexual activity may not have included sexual intercourse. The definition of sexual activity is broad enough in many studies to encompass even kissing or touching.²⁵⁵ This limitation in behavioral data, in addition to the need to monitor changes in sexual risk behavior among youth, suggests the utility of using biomarkers such as herpes simplex virus type 2 (HSV-2) prevalence and incidence to monitor levels and trends of sexual activity among youth in MENA.

Recent increases in risky behavior

One of the concerning trends in MENA is that of increases in risky behavior, particularly among the youth. Attention needs to focus on identifying trends in risky behavior among this population group.²⁵⁶ Increases in sexual risk behavior have been observed in other regions, such in Latin America and Asia, due to the changes in the socioeconomic conditions.²⁵⁷

Anecdotal observations suggest that risky behaviors and sexual activity are increasing among both male and female youth in MENA.²⁵⁸ These observations are supported by a trend of increasing HIV incidence in the younger age groups.²⁵⁹ Other trends also seem to suggest recent increases in risky behavior. In Afghanistan, risky behavior in terms of injecting drug use and commercial sex appears to have considerably increased since the Afghanistan war in 2001.²⁶⁰ In the Islamic Republic of Iran, reported STD cases have grown by 38% annually since 1998, and the number of cases has quadrupled between 1992 and 2004.²⁶¹ Genital ulcers have grown by a factor of 6.2 over the same period, with 45% of

the cases occurring in the 20–29 years age group.²⁶²

In Kuwait, STI incidence has been steadily increasing,²⁶³ and there appears to be an increase in precancerous cervical lesions in women, with appearance of these lesions at a younger age.²⁶⁴ In Lebanon, a similar trend of increases in precancerous lesions has been reported over the years from 2002 to 2006, also at younger ages.²⁶⁵ Also in Lebanon, repeated behavioral surveys have indicated increased risky behavior among youth.²⁶⁶ In Saudi Arabia, the percentage of abnormal Pap smears appears to be increasing.²⁶⁷ In Turkey, the share of high school students who reported having sexual experiences increased from 11.3% in 1997 to 22.8% in 2004.²⁶⁸ Also in Turkey, the prevalence of syphilis among blood donors, though still at low levels, has increased fivefold between 1987 and 2002 in one study,²⁶⁹ and tenfold in another study between 1998 and 2007.²⁷⁰

Analytical summary

Youth form the largest vulnerable population in MENA and are facing enormous challenges that could expose them to HIV infection. Traditional forms of managing youth sexuality are in decline and are not of much use with the rapidly changing socioeconomic realities. Because youth do not appreciate the importance of safe sex, and they have no other sexual outlets, they are increasingly engaging in risky sexual behavior to dissipate their sexual energy.

Youth disproportionately contribute to the HIV epidemic in MENA and behavioral data suggest considerable and increasing levels of sexual and injecting drug risk behaviors among them. Much research is needed to track the trends of risky behavior and STIs of the youth population. Effective HIV prevention interventions for youth that focus specifically on the behaviors that can lead to HIV exposure need to be formulated.

²⁵³ Mohammad et al., "Sexual Risk-Taking Behaviors."

²⁵⁴ Mohammad et al., "Sexual Risk-Taking Behaviors"; Mohammadi et al., "Reproductive Knowledge, Attitudes and Behavior."

²⁵⁵ Mohammadi et al., "Reproductive Knowledge, Attitudes and Behavior."

²⁵⁶ Pisani et al., "HIV Surveillance."

²⁵⁷ Curtis and Sutherland, "Measuring Sexual Behaviour in the Era of HIV/AIDS"; Gammeltoft, "Seeking Trust and Transcendence"; Ono-Kihara and Kihara, "The First Nationwide Sexual Behavior Survey in Japan."

²⁵⁸ Busulwa, "HIV/AIDS Situation Analysis Study."

²⁵⁹ UNAIDS, and WHO, *AIDS Epidemic Update 2005*.

²⁶⁰ World Bank, "Mapping and Situation Assessment."

²⁶¹ Iran Center for Disease Management, Three Month Statistics of the MoH AIDS Office; Iran Center for Disease Management, *HIV/AIDS and STIs Surveillance Report*.

²⁶² Iran Center for Disease Management, Three Month Statistics of the MoH AIDS Office.

²⁶³ Al-Fouzan and Al-Mutairi, "Overview."

²⁶⁴ Kapila et al., "Changing Spectrum of Squamous Cell Abnormalities."

²⁶⁵ Karam et al., "Prevalence of Sexually Transmitted Infections."

²⁶⁶ Kassak et al., "Final Working Protocol."

²⁶⁷ Altaf, "Cervical Cancer Screening."

²⁶⁸ Yamazhan et al., "Attitudes towards HIV/AIDS."

²⁶⁹ Kocak et al., "Trends in Major Transfusion-Transmissible Infections."

²⁷⁰ Coskun et al., "Prevalence of HIV and Syphilis."

POPULATION MOBILITY AND HIV

One of the most vulnerable groups in MENA is that of mobile populations, including voluntary or economic migrants, refugees, internally displaced persons, individuals who move for other compelling reasons, nomads, and pastoralists.²⁷¹ Other groups such as truck drivers, seafarers, and uniformed personnel are also mobile populations, but here these groups are classified as potential bridging populations (see chapter 6).

The vulnerability of mobile populations stems from poverty, separation from family and regular sexual partners, differences in language and culture leading to isolation, separation from native sociocultural background, lack of community support, lack of access to health and social services, and a sense of anonymity.²⁷² Displacement, migration, and high urban poverty provide fertile grounds for the establishment of sex work.²⁷³ The loneliness and anonymity associated with living in a foreign country can be conducive to practicing high-risk behavior.²⁷⁴

Complex emergencies are prevalent in MENA, such as in Afghanistan, Iraq, Lebanon, Somalia, and the West Bank and Gaza, and these emergencies are key drivers of population mobility. Emergencies can lead to rapid changes in risk behavior and may facilitate HIV infectious spread.²⁷⁵ The presence of foreign troops and military occupations can complicate HIV efforts. The presence of a large number of foreign troops in Afghanistan has been associated with rapid economic development, but has yielded more opportunities for risky behavior such as IDU and female sex work.²⁷⁶ The presence of the African Peace Keepers in Darfur has added another risk factor for HIV infection, particularly among women.²⁷⁷

There is evidence in MENA that HIV patients are mobile and have crossed national boundaries. Half of the reported HIV cases in Tunisia were believed to have at some point crossed the border into Tunisia, mainly from Libya, to seek

antiretroviral treatment or to undergo drug rehabilitation.²⁷⁸

Migrants

In this section we discuss migration as vulnerability for HIV infection.

Prevalence of migration

The Arab Middle East has received more than 10% of the world's migrants,²⁷⁹ with the Persian Gulf region hosting the largest share of guest workers to indigenous populations anywhere.²⁸⁰ The International Organization for Migration (IOM) estimates that there are 14 million international migrants in the Arab Middle East.²⁸¹ Saudi Arabia is the leading source of remittances in MENA, and second only to the United States as a source of migrant worker remittances globally.²⁸² Three MENA countries, Egypt, Lebanon, and Jordan, are among the nine largest recipients of remittances from migrant workers among developing countries.²⁸³

Migration has enormously affected demographics in MENA. It is estimated that a million Afghans leave Afghanistan every year to work abroad.²⁸⁴ Seasonal economic migration also appears to be high in Afghanistan.²⁸⁵ The migrant workforce accounted for 4.7% of the total population in the Republic of Yemen in 1994.²⁸⁶ There are 875,000 Yemenis registered as living abroad.²⁸⁷ It is estimated that there are 2 million economic migrants²⁸⁸ and 16 million pastoralists²⁸⁹ in the Horn of Africa region. Migration and being away from family are associated with higher exposure to STIs.²⁹⁰

Structural factors related to migration

There are structural problems in MENA that drive the high levels of migration. The Arab

²⁷¹ IGAD, *IGAD/World Bank Cross Border Mobile Population Mapping Exercise*.

²⁷² *Ibid.*

²⁷³ Ati, "HIV/AIDS/STIs Social and Geographical Mapping."

²⁷⁴ Al-Mutairi et al., "Clinical Patterns."

²⁷⁵ Salama and Dondero, "HIV Surveillance in Complex Emergencies."

²⁷⁶ World Bank, "Mapping and Situation Assessment."

²⁷⁷ Basha, "Vulnerable Population Research in Darfur."

²⁷⁸ UNAIDS, and WHO, *AIDS Epidemic Update 2003*.

²⁷⁹ Jaber, Métral, and Dorai, "Migration in the Arab Middle East."

²⁸⁰ IOM, "World Migration."

²⁸¹ *Ibid.*

²⁸² *Ibid.*

²⁸³ *Ibid.*

²⁸⁴ Ryan, "Travel Report Summary."

²⁸⁵ World Bank, "Mapping and Situation Assessment."

²⁸⁶ Yemen Ministry of Planning and Development, *Yemen Human Development Report 1998*.

²⁸⁷ Yemen MOH, *National Strategic Framework*.

²⁸⁸ HOAP, "Regional Partnership on HIV Vulnerability."

²⁸⁹ Morton, "Conceptualising the Links."

²⁹⁰ Carael, Cleland, and Adeokun, "Overview"; Obasi et al., "Antibody to Herpes Simplex Virus Type 2."

Middle East has the highest unemployment rate in the world at an average of 15%,²⁹¹ three times the global average.²⁹² There are currently 6 million new entrants to the labor market every year in a flow that is proportionately greater than that of any other region in the world.²⁹³ Economic hardship and poor economic development are forcing many to emigrate in search of employment. The industrial labor productivity per worker has been in decline since the 1980s, with the level in 1990 comparable to that in 1970.²⁹⁴

The large gap in income across countries and the pockets of wealth created by oil and gas revenues are also major drivers of migration. Rapid economic development in oil-rich states, in addition to rising personal wealth, has created an enormous demand for migrant labor in the construction and services sectors.

Although women's share of employment is only 29% of the regional labor force, women from countries outside the region, principally from Bangladesh, Ethiopia, India, Indonesia, Pakistan, the Philippines, Sri Lanka, and Thailand, are recruited to fill positions not filled by indigenous women.²⁹⁵ These women are filling positions as domestic workers or in the service sector in a trend that has contributed to increasing the percentage of women among migrants in recent years.²⁹⁶

Domestic workers in MENA are vulnerable to marginalization, gender-based discrimination, and exploitation²⁹⁷ and some are experiencing sexual abuse or are being forced into sex work.²⁹⁸ Abundant articles in the media document cases of harassment, sexual abuse, and violence against domestic workers, who on occasion can find no escape from their employers and jump out of windows or off of balconies to their death or injury.²⁹⁹ Trafficking in persons is another aspect of migration in MENA.³⁰⁰

²⁹¹ Fergany, *Aspects of Labor Migration*.

²⁹² UNDP, *The Arab Human Development Report 2002*.

²⁹³ IOM, "World Migration."

²⁹⁴ Fergany, *Aspects of Labor Migration*.

²⁹⁵ IOM, "World Migration."

²⁹⁶ *Ibid.*

²⁹⁷ *Ibid.*

²⁹⁸ Jenkins and Robalino, "HIV in the Middle East and North Africa"; Al-Najjar, "Women Migrant Domestic Workers in Bahrain"; Sabban, "United Arab Emirates: Migrant Women"; UNDP, "HIV Vulnerabilities of Migrant Women."

²⁹⁹ IOM, "World Migration."

³⁰⁰ *Ibid.*

The segmentation of the labor market is one of the key structural trends that are contributing to heavy dependence on migrant workers. Indigenous populations are reluctant to work in certain sectors of the economy, relegating those sectors to migrant workers. Some countries are both exporters and importers of migrant workers. Migrant workers constitute about 20% of the resident labor force in Jordan, even though millions of Jordanians are working abroad and over 400,000 net emigrants have left the country between 1999 and 2003.³⁰¹ The growth of the Qualifying Industrial Zones in Jordan has also created more demand for migrant workers.³⁰²

The rural-urban and urban-urban migrations are also structural challenges in MENA.³⁰³ In Sudan, large percentages of different population groups reported living in a place other than their place of birth, including 59.3% of university students,³⁰⁴ 91.7% of military personnel,³⁰⁵ 76.9% of prisoners,³⁰⁶ 78.2% of truck drivers,³⁰⁷ 58.4% of tea sellers,³⁰⁸ 66.5% of street children,³⁰⁹ 51.4% of ANC attendees,³¹⁰ 62.6% of FSWs,³¹¹ 56.3% of TB patients,³¹² 55.9% of STD clinic attendees,³¹³ and 78.3% of suspected AIDS patients.³¹⁴ The main reported causes of movement were work, marriage, war, education, treatment, and drought. Women are especially vulnerable in this kind of migration because it exposes them to the risk of being trapped into sex work.³¹⁵ Among FSWs in the Red Sea State in Sudan, 59% were migrants from outside of this state³¹⁶; and among FSWs in Khartoum State, only about one-quarter were born in this state.³¹⁷ In Pakistan, 40%–70% of different priority populations reported having emigrated

³⁰¹ *Ibid.*

³⁰² *Ibid.*

³⁰³ *Ibid.*

³⁰⁴ Ahmed, *University Students*.

³⁰⁵ Ahmed, *Military*.

³⁰⁶ Ahmed, *Prisoners*.

³⁰⁷ Ahmed, *Truck Drivers*.

³⁰⁸ Ahmed, *Tea Sellers*.

³⁰⁹ Ahmed, *Street Children*.

³¹⁰ Ahmed, *Antenatal*.

³¹¹ Ahmed, *Sex Sellers*.

³¹² Ahmed, *TB Patients*.

³¹³ Ahmed, *STDs*.

³¹⁴ Ahmed, *AIDS Patients*.

³¹⁵ Taha, "Sudanese Women Carry a Double Burden."

³¹⁶ Ati, "HIV/AIDS/STIs Social and Geographical Mapping."

³¹⁷ ACORD, "Qualitative Socio Economic Research."

from other cities.³¹⁸ In the Islamic Republic of Iran, 14.5% of the population had migrated within the country.³¹⁹

The immigration systems in MENA are generally those of guest-worker-based labor systems where a large fraction of migrants are single or without their spouses.³²⁰ These workers are vulnerable to practices that increase the risk of exposure to HIV.³²¹ There is a large male-to-female disparity among migrant workers. In Saudi Arabia, 69.5% of migrant workers are males while 30.5% are females, and the vast majority of these workers are single or away from spouses.³²² A large share of the population in some MENA countries, if not the majority of the population, is made up of migrants, such as 23% in Oman,³²³ 76% in the United Arab Emirates,³²⁴ and 62% in Kuwait.³²⁵ The ratio of nonnationals among the adult population is even higher, such as in Kuwait, where it is 70% and almost half of nonnationals are single.³²⁶

The sizable contribution of migrants in the labor force is not limited to the oil-rich economies. Even in a country like Jordan, with a resident labor force of 1,150,000 people, there were around 125,000 documented migrant workers in 2003 and as many undocumented migrants.³²⁷ In the Maghreb region of MENA, the dominant pattern of migration is to Western Europe.³²⁸ The Maghreb region is also increasingly used as a transit route toward Europe, or as a destination of sub-Saharan African migrants.³²⁹

Sexual and injecting risk behaviors among migrants

Several studies have documented some aspects of sexual and injecting drug behaviors among migrants. About 73% of IDUs in Afghanistan lived or worked outside of Afghanistan,³³⁰ and 66% reported starting drug use while living in

the Islamic Republic of Iran.³³¹ Among married STD clinic attendees in Kuwait, 70% were living alone and the average number of sexual partners was 2.3.³³²

Over 55% of single migrant men in Pakistan reported sexual experiences and 36% of married migrant men reported premarital sex.³³³ Over the preceding 12 months, 13% of single migrant men reported nonmarital female sexual partners, 7% reported contacts with FSWs, and 2% reported sexual contacts with other males.³³⁴ Among Pakistani workers in the Middle East, there is evidence of high-risk behaviors such as contacts with sex workers.³³⁵

Women from the former Soviet Union represent the majority of FSWs in the United Arab Emirates.³³⁶ FSWs come to the Persian Gulf region through a manipulation of immigration laws that makes it possible for these women to stay as irregular migrants.³³⁷ Official efforts continue to focus on drug smuggling and money laundering in the entertainment industry rather than on sex trade.

HIV spread among migrants

The Persian Gulf countries have instituted a policy of mandatory and periodic HIV testing of migrant workers since at least 2002.³³⁸ Most often the testing happens without counseling or informed consent.³³⁹ Migrant workers who test positive for HIV are deported. Already this policy has resulted in the deportation of over 400 HIV-positive people from Bahrain alone.³⁴⁰

The rate of positive HIV testing among migrant workers has been hovering around 0.021%, with a range of 0.011% to 0.031% over several years in Kuwait,³⁴¹ 0.05% in Qatar,³⁴² 0.1% to 0.2% in Saudi Arabia,³⁴³ and

³¹⁸ Pakistan National AIDS Control Program, "Report of the Pilot Study in Karachi & Rawalpindi."

³¹⁹ Iranian Statistics Center, "Iran as Reflected by Statistics."

³²⁰ IOM, "World Migration."

³²¹ UNAIDS, "Notes on AIDS in the Middle East and North Africa."

³²² Madani, "Sexually Transmitted Infections in Saudi Arabia."

³²³ UNAIDS, "Notes on AIDS in the Middle East and North Africa."

³²⁴ Ibid.

³²⁵ Al-Fouzan and Al-Mutairi, "Overview."

³²⁶ Ibid.

³²⁷ IOM, "World Migration."

³²⁸ Ibid.

³²⁹ Ibid.

³³⁰ World Bank, "Mapping and Situation Assessment."

³³¹ Action Aid Afghanistan, "HIV AIDS in Afghanistan."

³³² Al-Mutairi et al., "Clinical Patterns."

³³³ Faisal and Cleland, "Migrant Men."

³³⁴ Ibid.

³³⁵ Khawaja et al., "HIV/AIDS and Its Risk Factors in Pakistan"; Shah et al., "HIV-Infected Workers Deported"; Baqi, Kayani, and Khan, "Epidemiology and Clinical Profile."

³³⁶ IOM, "World Migration."

³³⁷ Ibid.

³³⁸ Khoja, "Rules & Regulations."

³³⁹ UNDP, "HIV Vulnerabilities of Migrant Women."

³⁴⁰ S. A. Jowder, Director, National HIV/AIDS/STI Program, personal communication (2007).

³⁴¹ Akhtar and Mohammad, "Spectral Analysis of HIV Seropositivity."

³⁴² Saeed, "Thirty-Two HIV/AIDS Cases Detected in June."

³⁴³ T. A. Madani, personal communication (2007).

0.06% in the United Arab Emirates.³⁴⁴ Many of the migrant workers who tested positive and were then deported had negative serology results for HIV when their residencies were initially granted. This suggests an ongoing HIV transmission within the Persian Gulf region and is confirmed by HIV case reports among migrants from countries that send their migrants primarily to the Arab world. There is evidence of HIV infection in the Persian Gulf region among migrants from Afghanistan,³⁴⁵ Egypt,³⁴⁶ Indonesia,³⁴⁷ Lebanon,³⁴⁸ the Philippines,³⁴⁹ Sri Lanka,³⁵⁰ Sudan,³⁵¹ and the Republic of Yemen.³⁵² Most exposures to STDs among migrant STD clinic attendees in Kuwait (92%) occurred in Kuwait.³⁵³

In Bangladesh, 51% of the reported cumulative HIV cases in 2002 were among returning migrant workers and 47 out of 259 HIV infections between 2002 and 2004 occurred while being away as migrants.³⁵⁴ Among the newly identified infections in 2004, 56% were among returning migrants.³⁵⁵ Most diagnosed HIV infections among Pakistanis for the first two decades following discovery of HIV/AIDS were attributed to deported HIV-positive migrants from the Persian Gulf states.³⁵⁶ These workers represented 61% to 86% of reported cases every year in Pakistan during the 1996–98 period.³⁵⁷ In the Philippines, 34% of PLHIV were overseas Filipino workers and 17% of them were domestic workers, while only 8% were entertainers.³⁵⁸ In Sri Lanka, about 40% of identified HIV infections among women have been linked to working in the Persian Gulf region, mostly as domestic workers.³⁵⁹

³⁴⁴ U.A.E. MOH, "United Arab Emirates: Migrant Women."

³⁴⁵ Ryan, "Travel Report Summary"; Todd et al., "Seroprevalence and Correlates of HIV."

³⁴⁶ Jenkins and Robalino, "HIV in the Middle East and North Africa."

³⁴⁷ UNDP, "HIV Vulnerabilities of Migrant Women."

³⁴⁸ Pieniazek et al., "Introduction of HIV-2."

³⁴⁹ UNDP, "HIV Vulnerabilities of Migrant Women."

³⁵⁰ Ibid.

³⁵¹ Hierholzer et al., "HIV Type 1 Strains from East and West Africa."

³⁵² Saad et al., "HIV Type 1 Strains."

³⁵³ Al-Mutairi et al., "Clinical Patterns."

³⁵⁴ UNDP, "HIV Vulnerabilities of Migrant Women."

³⁵⁵ Ibid.

³⁵⁶ Khawaja et al., "HIV/AIDS and Its Risk Factors in Pakistan"; Rai et al., "HIV/AIDS in Pakistan"; Shah et al., "HIV-Infected Workers Deported"; Kayani et al., "A View of HIV-I Infection in Karachi."

³⁵⁷ UNDP, "HIV Vulnerabilities of Migrant Women."

³⁵⁸ Ibid.

³⁵⁹ Jenkins and Robalino, "HIV in the Middle East and North Africa."

Due to the hostile environment endured by HIV-positive migrant workers, including the threat of immediate deportation, there is a constant fear of persecution that creates challenges in supporting HIV efforts to aid migrants in MENA.³⁶⁰

Refugees and internally displaced persons

This section discusses population displacement as a vulnerability for HIV infection.

Numbers of refugees and internally displaced persons

There were some 42 million forcibly displaced people worldwide at the end of 2008.³⁶¹ This includes 15.2 million refugees, 827,000 asylum seekers, and 26 million IDPs.³⁶² Pakistan is host to the largest number of refugees worldwide (1.8 million), followed by Syria (1.1 million), and the Islamic Republic of Iran (980,000).³⁶³ Afghan and Iraqi refugees account for almost half of all refugees under the United Nations High Commissioner for Refugees (UNHCR) responsibility worldwide.³⁶⁴ In addition, there are 4.7 million Palestinian refugees under the responsibility of the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA).³⁶⁵

MENA continues to have high numbers of internally displaced persons in Afghanistan, Iraq, Somalia, and Sudan. There are 2.6 million IDPs in Iraq.³⁶⁶ The Iraqi diaspora involves more than 4 million people who are living abroad as refugees, asylum seekers, illegal migrants, migrant workers, or naturalized citizens of other countries.³⁶⁷ Sudan is ranked among the leading countries in the world in terms of the number of IDPs.³⁶⁸ There are about 4 million IDPs living in Khartoum and other states.³⁶⁹ During the civil war in Lebanon, almost a third of the population was displaced.³⁷⁰

³⁶⁰ *AIDS Policy Law*, "Fear of Persecution."

³⁶¹ UNHCR, "2008 Global Trends."

³⁶² Ibid.

³⁶³ Ibid.

³⁶⁴ Ibid.

³⁶⁵ Ibid.

³⁶⁶ Ibid.

³⁶⁷ IOM, "World Migration."

³⁶⁸ IGAD, *IGAD/World Bank Cross Border Mobile Population Mapping Exercise*.

³⁶⁹ Sudan Government of National Unity, *United Nations National Integrated Annual Action Plan 2007*; Hampton, "Internally Displaced People."

³⁷⁰ IOM, "World Migration."

Vulnerability to HIV

The characteristics that define a complex emergency, such as conflict, social instability, increased poverty, environmental destruction, and powerlessness, can increase vulnerability to HIV by reducing access to HIV prevention services, breaking down health infrastructure, disrupting social support networks, increasing exposure to sexual violence (rape, sexual abuse, and exploitation), increasing the number of persons having sex in return for food and shelter, and forcing population movement to an area of higher HIV prevalence.³⁷¹

Studies have shown that the factors that affect HIV transmission during humanitarian emergencies are complex, depending upon many dynamic and interacting factors, including HIV prevalence rates in the area of origin and that of the host population, level of interaction between the displaced and surrounding populations, length of time of displacement, and location of displacements (for example, urban camps versus isolated camps).³⁷²

Levels of HIV knowledge tend to differ among displaced persons, and the location of refuge affects the level of knowledge. Among IDUs in Pakistan, Afghani refugees had lower HIV/AIDS knowledge than Pakistani nationals.³⁷³ Among refugees returning to Afghanistan, 79% of returnees from the Islamic Republic of Iran reported receiving information about HIV, but only 51% of returnees from Pakistan reported receiving such information.³⁷⁴ Low levels of knowledge were found among IDPs in Sudan in comparison to other population groups.³⁷⁵ Refugees in the Republic of Yemen were found to have lower knowledge than both citizen and marginalized populations.³⁷⁶ This may be due to lack of access to appropriate HIV awareness messages in languages refugees can understand.

Risky behavior and risk of HIV infection

A few studies in MENA have attempted to document sexual behavior among refugees and compare this to the surrounding host communities.

In Sudan, 9.1% of refugees reported extramarital affairs,³⁷⁷ and among IDPs, 5.0% reported ever using a condom, 21.3% reported premarital and extramarital sex, 2.4% reported premarital sex, and 1.9% exchanged sex for money.³⁷⁸ Also in Sudan, 41% of unmarried male refugees had casual sex in the last year and 0% had ever had transactional sex partners.³⁷⁹ Among IDPs as well as the nondisplaced population, these percentages were 18% and 2%, respectively.³⁸⁰ Condom use was found to be much higher among refugees (35%) than among IDPs and those not displaced (8%).³⁸¹

A systematic review of HIV infection in conflict-affected and displaced people in seven sub-Saharan African countries found insufficient data to support the assertion that conflict, forced displacement, and wide-scale rape increase HIV prevalence.³⁸² There is evidence in MENA that does not support a link between increased HIV risk and population displacement such as among Somali and Sudanese refugees and IDPs.³⁸³ There is also evidence that suggests better HIV knowledge and prevention practices among refugees. A behavioral surveillance study in Juba, Southern Sudan, showed that returning refugees compared to settled populations had greater HIV knowledge and better HIV prevention practices, such as condom use.³⁸⁴

However, there is also some evidence in MENA that seems to suggest some link between displacement and risk of exposure to HIV. Yet, it is not clear whether this merely reflects the influence of home country risk factors and HIV prevalence, or HIV risks specific to the refugees in the host country. For instance, Afghani IDUs in Pakistan reported higher injecting drug use (18.8% versus 12.3%) and nonsterile needle use (72.2% versus 48.2%) compared to Pakistani IDUs.³⁸⁵ A survey in Somalia showed that women in IDP camps have higher HIV prevalence than

³⁷¹ UNAIDS and UNHCR, "Strategies."

³⁷² Spiegel et al., "Prevalence of HIV."

³⁷³ Zafar et al., "HIV Knowledge and Risk Behaviors."

³⁷⁴ Action Aid Afghanistan, "HIV AIDS in Afghanistan."

³⁷⁵ Ahmed, *Internally Displaced People*.

³⁷⁶ Al-Serouri, "Assessment of Knowledge."

³⁷⁷ Elkirim et al., *The National Strategic Plan*.

³⁷⁸ Ahmed, *Internally Displaced People*.

³⁷⁹ UNHCR, "HIV Behavioural Surveillance Survey."

³⁸⁰ *Ibid.*

³⁸¹ *Ibid.*

³⁸² Spiegel et al., "Prevalence of HIV."

³⁸³ UNHCR, *HIV Sentinel Surveillance among Antenatal Clients and STI Patients*; UNHCR, "HIV Behavioural Surveillance Survey."

³⁸⁴ UNHCR, "HIV Behavioural Surveillance Survey."

³⁸⁵ Zafar et al., "HIV Knowledge and Risk Behaviors."

women in the general population.³⁸⁶ In Southern Sudan, HIV prevalence was 4.4% in Yei town, where half of the respondents were internally displaced, but only 0.4% in Rumbek town, where the level of displacement is considerably lower.³⁸⁷ In North Sudan, the prevalence among ANC women who were internally displaced (1.6%) was much higher than that of other pregnant women (0.3%).³⁸⁸

No evidence has been found in MENA to support the claim that refugees spread HIV infection in host communities.³⁸⁹

HIV spread among refugees and internally displaced persons

Several other point-prevalence surveys documented the level of HIV spread among displaced populations in MENA. Among Afghani refugees in the Islamic Republic of Iran, HIV prevalence was 0.2%.³⁹⁰ Among Sudanese refugees, separate studies reported that HIV prevalence was 5.0% and 1.2% for ANC attendees and 0.8% for prevention of mother-to-child transmission (PMTCT) attendees in Kenya³⁹¹; 5% for men and 2% for women in Ethiopia³⁹²; and 1% and 2.7% in Uganda.³⁹³ In several studies in Sudan, HIV prevalence among IDPs or refugees was 1.57%,³⁹⁴ 1%,³⁹⁵ 4%,³⁹⁶ 1%,³⁹⁷ 0.26%,³⁹⁸ and 0.27%.³⁹⁹ Among Somali refugees attending ANCs in Kenya, HIV prevalence was 0.7% in 2003,⁴⁰⁰ 1.4% in 2005,⁴⁰¹ and 1% in 2006.⁴⁰² Also at this

location, studies found that HIV prevalence was 0.1% among Somali refugees attending ANCs who were offered PMTCT services, and 2.0% (2003), 1.7% (2005), and 0.9% (2006) among Somali refugees attending STI clinics.⁴⁰³

Analytical summary

Population mobility is a key HIV risk factor in MENA due to the sheer size of the mobile populations and the extensive presence of this vulnerability across MENA countries. The complex emergencies that continue to be present in the region lead to increased vulnerability to HIV. It is therefore important that forcibly displaced populations are included in national HIV programs and have universal access to prevention, treatment, and care programs.

STREET CHILDREN

Though prisoners, youth, and mobile populations are the key vulnerable populations in MENA, another important vulnerable population is that of “street children.”

The presence of street children is an increasingly emerging phenomenon in several MENA countries, as well as globally.⁴⁰⁴ Causes of this phenomenon in MENA include poverty, family disruption, natural and manmade disasters, following friends, and desiring drugs.⁴⁰⁵ There are two types of street children: “home-based,” where children spend most of the day on the street but still return home at night and may have some family support; and “street-based,” where children spend most of day and night on the street and are functionally without family.⁴⁰⁶

Boys often engage in odd jobs, begging, theft, and sex work.⁴⁰⁷ Girls, who have fewer work opportunities, obtain money primarily through begging and sex work.⁴⁰⁸ Street girls in Sudan reported being frequently raped by street boys,

³⁸⁶ Somaliland Ministry of Health and Labour, *Somaliland 2007 HIV/Syphilis Seroprevalence Survey*.

³⁸⁷ Kaiser et al., “HIV, Syphilis, Herpes Simplex Virus 2, and Behavioral Surveillance.”

³⁸⁸ Sudan Ministry of Health, *Sudan National HIV/AIDS Surveillance Unit*.

³⁸⁹ UNHCR, “HIV Behavioural Surveillance Survey”; Spiegel et al., “Prevalence of HIV.”

³⁹⁰ SeyedAlinaghi, “Assessing the Prevalence of HIV.”

³⁹¹ UNHCR, *HIV Sentinel Surveillance among Conflict Affected Populations*.

³⁹² Holt et al., “Planning STI/HIV Prevention.”

³⁹³ UNHCR, *HIV Sentinel Surveillance Report*; Uganda MOH, *STD/HIV/AIDS Surveillance Report*.

³⁹⁴ SNAP and UNAIDS, “HIV/AIDS Integrated Report North Sudan, 2004–5.”

³⁹⁵ Ahmed, *Internally Displaced People*.

³⁹⁶ SNAP, “HIV Sentinel Surveillance.”

³⁹⁷ Ahmed, *Internally Displaced People*.

³⁹⁸ Sudan National AIDS/STIs Program, *2007 ANC HIV Sentinel Sero-Survey*.

³⁹⁹ Ibid.

⁴⁰⁰ UNHCR, “HIV Sentinel Surveillance in Dadaab Refugee Camps” (2003).

⁴⁰¹ UNHCR, “Sentinel Surveillance Report Dadaab Refugee Camps” (2005).

⁴⁰² UNHCR, *HIV Sentinel Surveillance among Antenatal Clients and STI Patients*.

⁴⁰³ Ibid.

⁴⁰⁴ Dallape, “Urban Children”; UNICEF, *The State of the World's Children 2006*.

⁴⁰⁵ Khalil, *Street Children and HIV/AIDS*; Kudrati et al., “Sexual Health and Risk Behaviour.”

⁴⁰⁶ Khalil, *Street Children and HIV/AIDS*.

⁴⁰⁷ Kudrati, Plummer, and Yousif, “Children of the Sug.”

⁴⁰⁸ Ibid.

police, or other men, particularly at night.⁴⁰⁹ Seventeen percent of these girls report sex work as their main means of earning money.⁴¹⁰ Street children are especially threatened by police.⁴¹¹ Gang rape and substance abuse are common and 14% of street girls and 1% of street boys reported that sexual abuse is their greatest danger on the street.⁴¹²

The number of street children appears to be growing in Sudan as a consequence of high rates of population mobility resulting from civil strife, political conflict, and economic hardship, particularly in rural areas.⁴¹³ It is estimated that there are 70,000 working and street children in Sudan, of which 86% are males.⁴¹⁴ It is also estimated that there are 200,000 street children in Egypt,⁴¹⁵ and 5,000–7,000 street children⁴¹⁶ in Lahore, Pakistan.

Child prostitution appears to be a growing problem in Morocco where street children approach tourists offering their sexual services.⁴¹⁷ A study of male street children in Pakistan found that 40% of the boys had exchanged sex for money, drugs, or goods over the last three months.⁴¹⁸

An integrated biological and behavioral surveillance survey was conducted among street children 12–17 years old in Egypt.⁴¹⁹ Substantial levels of sexual activity were found, with 54.7% of males and 50% of females reporting previous sexual activity. Of these, 75.3% of the males and 71.9% of the females reported sexual activity within the 12 months preceding the survey. Alarming, 14.9% of these males and 33.3% of these females reported commercial sexual activity. Thirty-seven percent of the males reported being forced to have sex with males, and 6% reported being forced to have sex with females. Among females, 44.9% reported being forced to have sex with males.

Among males, 77.4% reported engaging in sex with other males.

Condom use was low among both males and females: 12% with commercial sex partners and 2% with noncommercial partners among males, and 13% with commercial sex partners and 6% with noncommercial partners among females. IDU was also reported by 1% of the males and 13.5% of the females. Other forms of substance abuse were reported by 67.9% of the males and 71.4% of the females. Knowledge of HIV/AIDS, STIs, and condoms was low among the surveyed street children.⁴²⁰

Among street children in Sudan, 5.8% reported ever using a condom, 56.3% reported premarital and extramarital sex, and 11.1% exchanged sex for money.⁴²¹ In the Islamic Republic of Iran, 60% of runaway girls are reported to become victims of sexual abuse within one week of leaving home, as well as having a substance abuse rate of 80%.⁴²²

These studies suggest a high-risk environment for street children in several MENA countries and provide clear evidence of how the vulnerability of this group is leading to high levels of risky behavior. Although no HIV cases were found in one of the studies in Egypt,⁴²³ the levels of reported risk behavior suggest potential HIV transmission if the infection enters this population. Indeed, there is documented evidence for some HIV prevalence among street children in MENA; HIV prevalence was reported to be 1.3%⁴²⁴ and 0%⁴²⁵ by two studies in Egypt, and by other studies as 0%⁴²⁶ in the Islamic Republic of Iran and 2.2%⁴²⁷ in Sudan.

VULNERABILITY SETTINGS: ANALYTICAL SUMMARY

MENA has several vulnerability factors and the vulnerable populations are diverse, with a large fraction of the population belonging to one or

⁴⁰⁹ Kudrati, Plummer, and Yousif, "Children of the Sug"; Lalor et al., "Victimisation amongst Street Children."

⁴¹⁰ Kudrati et al., "Sexual Health and Risk Behaviour."

⁴¹¹ Awad, "Sudanese Street Children."

⁴¹² Kudrati, Plummer, and Yousif, "Children of the Sug"; Plummer et al., "Beginning Street Life."

⁴¹³ Khalil, *Street Children and HIV/AIDS*.

⁴¹⁴ Consortium for Street Children, "A Civil Society Forum."

⁴¹⁵ Jenkins and Robalino, "HIV in the Middle East and North Africa."

⁴¹⁶ Towe et al., "Street Life and Drug Risk Behaviors."

⁴¹⁷ Kandela, "Child Prostitution and the Spread of AIDS."

⁴¹⁸ Towe et al., "Street Life and Drug Risk Behaviors."

⁴¹⁹ Egypt Ministry of Health and Population, and National AIDS Program, *HIV/AIDS Biological and Behavioral Surveillance Survey*.

⁴²⁰ Egypt Ministry of Health and Population, and National AIDS Program, *HIV/AIDS Biological and Behavioral Surveillance Survey*.

⁴²¹ Ahmed, *Street Children*.

⁴²² Navipour and Mohebbi, "Street Children."

⁴²³ Egypt Ministry of Health and Population, and National AIDS Program, *HIV/AIDS Biological and Behavioral Surveillance Survey*.

⁴²⁴ SNAP, UNICEF, and UNAIDS, "Baseline Study on Knowledge."

⁴²⁵ Egypt Ministry of Health and Population, and National AIDS Program, *HIV/AIDS Biological and Behavioral Surveillance Survey*.

⁴²⁶ Vahdani et al., "Prevalence of Hepatitis."

⁴²⁷ Ahmed, *Street Children*.

BOX 9.1

Youth, Drug Use, and Marginalization in Lebanon

“The drug user is exposed to HIV/AIDS, suicide, and death most of the times . . . there should be someone giving him support.” —Ramy

Ramy discussed several problems that face drug users, especially those of being exposed to HIV and other sexually transmitted infections, depression, and marginalization by family members, society, and law enforcement officers.

Ramy stated the example of “female drug users, who are engaged in sex work in order to purchase drugs, [and] cannot oblige their sexual partners to use condoms as prevention from HIV/AIDS and other STIs.” He added: “I guarantee that more than 90% of people who use drugs would seek opioid substitution therapy if provided at low-prices and available within specialized centers [drop-in centers] that offer health, social and counseling services.”

Ramy continued the story of the despair that he lived and that took over his life after 10 years of drug use. This led him to search for a solution, a way out of a worse situation—suicide—a solution [that] would stop his long suffering with drugs.

Then, Ramy met a social worker who introduced him to Soins Infirmiers et Développement Communautaire (SIDC) while visiting his friends in prison. SIDC was the NGO [nongovernmental organization] that led him down the road of reducing the harms that drugs were exposing

him to, and eventually to make the “life-changing” decision to stop using drugs.

Two years after health and psychological treatment and follow-up for Ramy, in addition to his work of outreach and peer education, he is transformed from being a drug user to a companion and supporting figure for his drug users friends.

They [drug users] have confidence in ex-drug users who are cured and who give them hope of becoming cured themselves, and who also help them to be prevented from HIV and hepatitis . . . those people [drug users] are exposed to several kinds of marginalization within their families, the society where they live, some of the health and medical centers, and law enforcement officers who specifically contribute to their unemployment because of their judicial record as a drug user.

Finally for Ramy, [a] “drug abuser is not a criminal, but a victim, and others have to accept him in the society without any discrimination, an attitude which helps to improve his health and helps him to be cured from drugs and thus he will become a productive and effective person in his society far from being marginalized and judged.”

Source: Middle East and North Africa Harm Reduction Network 2008.

multiple vulnerability settings. There are three key vulnerable populations in MENA: prisoners, youth, and mobile populations. The above evidence highlights the vulnerability of these populations to HIV infection.

Prisoners are the most vulnerable group and prevention efforts need to focus on this population. Youth are enduring immense challenges that may compel them to engage in risky

behavior. There appears to be increasingly risky behavior among the youth population and it would be useful for surveillance efforts to monitor trends of youth behavior and STI incidence. Mobile populations have an extensive presence across the region, but their vulnerability to risk practices is not widely acknowledged.

Vulnerability settings will continue to be among the drivers of HIV transmission for the

BOX 9.2

Iraqi Women Refugees and Commercial Sex in Syria

Human rights organizations, UNHCR, and the international press have documented anecdotes of a thriving industry of Iraqi girls as young as age 12 working in night clubs in Damascus following the invasion of Iraq in 2003. Reliable statistics of Iraqi girls engaged in sex work are not available.

“Nada, 16, was dumped by her father at the Iraq-Syria border after her cousin had raped her. Five Iraqi men took her from the border to Damascus, where they raped her and sold her to a woman who forced her to work in night clubs and private villas.”

Women picked up by the police are taken to government protection centers from where they frequently escape, are bailed out, or are sent to prison. Those deported to Iraq often make their way back to Syria.

In 2007, UNHCR reported 1.2 million Iraqi refugees in Syria. Despite the country’s relaxed entry policy for its Arab neighbors, refugees, with the exception of Palestinian refugees, are not officially allowed to hold

jobs. With the economic conditions declining over the extended period in exile or inside Iraq, aid workers and authorities attested to a marked increase in the numbers of Iraqi women and young girls engaged in sex work.

A United Nations report found that many women-headed families in “severe need” turned to sex work, in secret or with the knowledge or involvement of family members.

“I met three sisters-in-law recently who were living together and all prostituting themselves. They would go out on alternate nights—each woman took her turn—and then divide the money to feed all children” (Sister Marie-Claude, Good Shepherd Convent, Damascus).

The influx of Iraqi refugees to Syria overwhelmed the host country’s infrastructure and restrained access to services, particularly to health services, for the vulnerable women and young girls.

Sources: BBC News report, December 2007; New York Times, May 2007.

years to come unless efforts are created to address them. Nevertheless, addressing these vulnerabilities should not distract us from focusing prevention efforts on priority populations, including IDUs, MSM, and FSWs, which are at the highest risk of HIV infection in MENA.

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Proxy Biological Markers of Sexual Risk Behavior

Sexual and injecting drug use (IDU) risk behavior measures in the Middle East and North Africa (MENA) tend to be poor, partially due to limited surveillance efforts and partially due to the conservative nature of its societies and the stigma associated with sexual and IDU risk behaviors. Even when such risk behavior measures exist, they may not provide us with a precise or even accurate assessment of the risk of exposure to human immunodeficiency virus (HIV).

Sexual risk behavior, and to some extent injecting drug use, is a complex phenomenon that cannot be directly observed. Only indirect data are available on sexual activity and these data are typically collected from questionnaires, interviews, focus group discussions, and other qualitative methods.¹ The indirect nature of evidence, the private and sensitive nature of sexual behavior, the informational limitations of egocentric sexual behavior data, and the nonrandom biases in sexual behavior reporting, including social desirability and memory, can introduce elements of bias and uncertainty in available measures.² Part of the population, such as women, may under-report their sexual activity while another part of the population, such as men, may over-report their

sexual activity.³ The validity of reported risk behaviors from people whose risk behaviors are illegal, such as those of priority groups, is open to question.⁴

It is also challenging to precisely quantify risky behavior due to the multitude of facets of sexual behavior, from partnership formation to contact with sex workers, to heterogeneity in partner change rates, to assortative and age cohort mixing, among others. Network structure and concurrency of partnerships can further play a major role in HIV transmission.⁵ A monogamous person in a stable sexual partnership, who is considered to have low-risk behavior, can still be considered at high risk of infection because she/he can be connected through her/his partner, or the partner of the partner, to a high-risk sexual network. Conversely, a person with frequent partnership changes who is considered to have high-risk behavior, can still be at low risk of infection if his/her network is virtually closed with a low risk of HIV penetration.

Despite some evidence for substantial levels of reported sexual and IDU risk behaviors in some priority groups in MENA, HIV prevalence appears to remain at low levels. This may

¹ Obasi et al., "Antibody to Herpes Simplex Virus Type 2."

² Lee and Renzetti, "The Problems of Researching Sensitive Topics"; Caldwell and Quiggin, "The Social Context of AIDS"; Wadsworth et al., "Methodology of the National Survey"; Morris, "Telling Tails"; Morris, *Network Epidemiology*; Cleland et al., "Measurement of Sexual Behaviour."

³ Catania et al., "Methodological Problems."

⁴ Pisani et al., "HIV Surveillance."

⁵ Kretzschmar and Morris, "Measures of Concurrency in Networks"; Morris, "Sexual Networks and HIV"; Watts and May, "The Influence of Concurrent Partnerships"; Ghani, Swinton, and Garnett, "The Role of Sexual Partnership Networks."

suggest the limited explanatory power of available risk behavior measures. Faced with this dilemma, this chapter focuses on available data for sexually transmitted infections (STIs) with a special focus on herpes simplex virus type 2 (HSV-2) and human papillomavirus (HPV), which are relevant to the dynamics of HIV infectious spread. Biological markers of STIs provide inexpensive and reliable tools to gauge the nature of sexual activity in MENA and its manifestation in terms of the risk of HIV exposure. Most important, these measures provide us with an indication of the potential HIV spread in different population groups.

HSV-2 AS A MARKER OF SEXUAL RISK BEHAVIOR

Why HSV-2?

HSV-2, which causes the disease known as genital herpes, is one of the most infectious and widespread STIs,⁶ and is the leading cause of genital ulcer disease (GUD) in both developed and developing countries.⁷ It is estimated that there were 536 million people living with this infection in 2003, and 23.6 million people were newly infected in this same year.⁸ Genital herpes is almost exclusively transmitted sexually and induces the production of lifelong antibodies.⁹

The strong observed correlations between HSV-2 infection and sexual risk behavior¹⁰ suggested the use of HSV-2 antibodies in the blood as a convenient and objective serological marker of sexual behavior in different populations.¹¹ In addition to its role as a behavioral biomarker, there is extensive evidence that HSV-2 infection in both its clinical and subclinical forms substantially

increases HIV infection and transmission,¹² and that it had played a leading role in fueling the HIV epidemic in different populations.¹³ The vast majority of HIV-positive people are also infected with HSV-2, and HSV-2 is most often acquired before HIV.¹⁴

Due to the common risk factors between HIV and HSV-2 but the larger infectivity of the HSV-2 infection, HSV-2 spreads faster than HIV along the paths of sexual risk and it delineates the potential avenues of future HIV spread in the population. In a sense, HSV-2 infection acts as a “tour guide” for HIV infection. HSV-2 can quantify the risk of exposure to STIs even when conventional behavioral measures, such as partnership change rates, may fail to quantify the risk posed by the structure of sexual networks.¹⁵

HSV-2 prevalence levels

Several studies have documented HSV-2 prevalence levels in MENA and in related cultural settings as listed in table 10.1. It is estimated that there are 9.6 million females and 8.6 million males infected with HSV-2 in this region, and that 388,000 and 195,000 new infections occurred in the year 2003 among females and males, respectively.¹⁶ The pattern in table 10.1 is that of low or very low HSV-2 prevalence among general populations groups, but substantial prevalence among groups with identifiable risk factors such as male sex workers (MSWs), female sex workers (FSWs), “bar girls,” IDUs, and sexually transmitted disease (STD) clinic attendees.

A few other studies found higher HSV-2 prevalence levels in MENA. In the Arab Republic of Egypt, an HSV-2 prevalence of 32% was reported among female clinic attendees.¹⁷ In the Islamic Republic of Iran, a 28% prevalence was reported among a randomly selected population of women attending nine primary health care centers.¹⁸ In Jordan, a prevalence of 53% for males and 42% for females was reported among

⁶ O'Farrell, “Increasing Prevalence of Genital Herpes”; Smith and Robinson, “Age-Specific Prevalence of Infection”; Weiss, “Epidemiology of Herpes.”

⁷ Ahmed et al., “Etiology of Genital Ulcer Disease”; Mertz et al., “Etiology of Genital Ulcers”; Morse, “Etiology of Genital Ulcer Disease.”

⁸ Looker, Garnett, and Schmid, “An Estimate of the Global Prevalence.”

⁹ van de Laar et al., “Prevalence and Correlates of Herpes.”

¹⁰ Obasi et al., “Antibody to Herpes Simplex Virus Type 2”; van de Laar et al., “Prevalence and Correlates of Herpes”; Cowan et al., “Antibody to Herpes Simplex Virus Type 2”; Cunningham et al., “Herpes Simplex Virus Type 2 Antibody.”

¹¹ Nahmias, Lee, and Beckman-Nahmias, “Sero-Epidemiological and Sociological Patterns.”

¹² Freeman et al., “Herpes Simplex Virus 2 Infection.”

¹³ Abu-Raddad et al., “Genital Herpes”; Corey et al., “The Effects of Herpes.”

¹⁴ Corey et al., “The Effects of Herpes.”

¹⁵ Nagelkerke et al., “Body Mass Index.”

¹⁶ Looker, Garnett, and Schmid, “An Estimate of the Global Prevalence.”

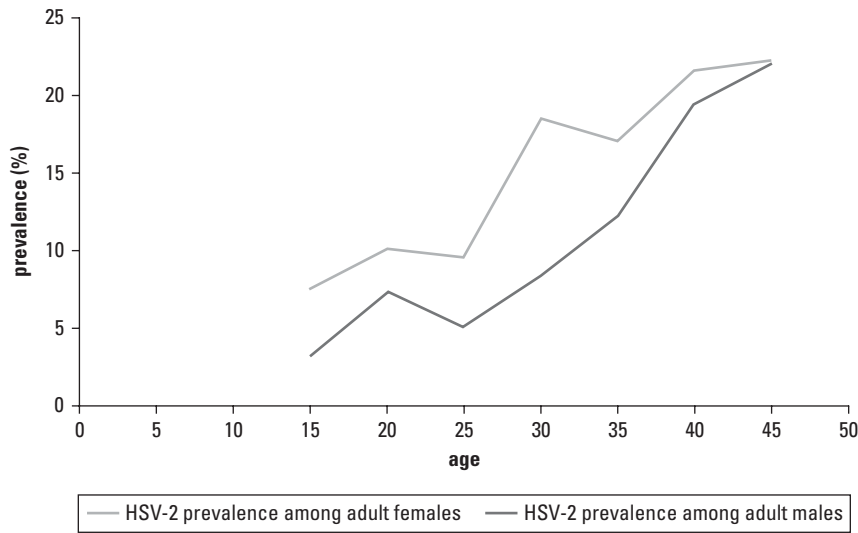
¹⁷ El-Sayed, Zaki, and Goda, “Relevance of Parvovirus B19.”

¹⁸ Kasraeian, Movaseghii, and Ghiam, “Seroepidemiological Study.”

Table 10.1 HSV-2 Prevalence in Different Population Groups

Country	HSV-2 prevalence
Arab Israelis	9.0% (Arab and Jewish non-Soviet immigrants; pregnant women; Dan et al. 2003) 2.4% (Arabs; STD clinic attendees; Feldman et al. 2003)
Bangladesh	12.0% (women attending basic health care clinic; Bogaerts et al. 2001)
Djibouti	2.0% (general population women; Marcelin et al. 2001) 5.0% (male blood donors; Marcelin et al. 2001) 49.0% (luxury bar FSWs; Marcelin et al. 2001) 81% (street-based FSWs; Marcelin et al. 2001)
Egypt, Arab Republic of	6.2% (STD clinic attendees; Saleh et al. 2000)
Iran, Islamic Republic of	8.25% (pregnant women; Ziyaeyan et al. 2007)
Lebanon	0.027% (general population women; Karam et al. 2007)
Morocco	12.9% (ANC attendees; Cowan et al. 2003) 16.2% (ANC attendees; WHO/EMRO Regional Database on HIV/AIDS) 13.0% (general population women; WHO/EMRO Regional Database on HIV/AIDS) 10.0% (general population men; WHO/EMRO Regional Database on HIV/AIDS) 26.0% (urban women with a median age of 40 years; Patnaik et al. 2007) 9.2% (male HIV sentinel surveillance attendees; Cowan et al. 2003) 6.5% (military personnel; Cowan et al. 2003) 6.7% (STD clinic attendees; WHO/EMRO Regional Database on HIV/AIDS)
Pakistan	11.0% (IDUs; Platt et al. 2009) 6.0% (IDUs; Platt et al. 2009) 8.0% (FSWs; Hawkes et al. 2009) 4.7% (FSWs; Hawkes et al. 2009) 7.4% (MSWs; <i>banthas</i> ; Hawkes et al. 2009) 2.5% (MSWs; <i>banthas</i> ; Hawkes et al. 2009) 14.0% (MSWs; <i>khotkis</i> ; Hawkes et al. 2009) 25.0% (MSWs; <i>khotkis</i> ; Hawkes et al. 2009) 54.0% (MSWs; <i>khusras</i> ; Hawkes et al. 2009) 31.3% (MSWs; <i>khusras</i> ; Hawkes et al. 2009)
Sudan	5.5% (household cluster survey; Southern Sudan; Kaiser et al. 2006) 27.0% (male Sudanese refugees in Ethiopia; Holt et al. 2003) 26.0% (female Sudanese refugees in Ethiopia; Holt et al. 2003)
Syrian Arab Republic	0.0% (pregnant women; Ibrahim, Kouwaitli, and Obeid 2000) 0.0% (general population women; Ibrahim, Kouwaitli, and Obeid 2000) 0.3% (general population men; Ibrahim, Kouwaitli, and Obeid 2000) 0.0% (neonates; Ibrahim, Kouwaitli, and Obeid 2000) 9.5% (STD clinic attendees; Ibrahim, Kouwaitli, and Obeid 2000) 8.0% (women with cervical cancer; Ibrahim, Kouwaitli, and Obeid 2000) 20.0% ("bar girls"; Ibrahim, Kouwaitli, and Obeid 2000) 34.0% (FSWs; Ibrahim, Kouwaitli, and Obeid 2000)
Turkey	5.0% (pregnant women; Dolar et al. 2006) 8.0% (women with pregnancy complications; Cengiz et al. 1993) 5.5% (blood donors; Dolar et al. 2006) 4.8% (sexually active adults; Dolar et al. 2006) 8.3% (hotel staff; Dolar et al. 2006) 17.3% (patients with genital warts; Dolar et al. 2006) 60.0% (FSWs; Dolar et al. 2006) 6.15% (IgM; FSWs; Gul et al. 2008) 80.0% (IgG; FSWs; Gul et al. 2008)
United Arab Emirates	12.0% (migrant workers; N. J. Nagelkerke, personal communication [2007])

Figure 10.1 HSV-2 Prevalence for Selected Populations, by Age Group in Morocco



Source: Cowan et al. 2003.

healthy university students aged 18–24 years.¹⁹ In Saudi Arabia, a prevalence of 27% was reported among pregnant women.²⁰ Finally, in Turkey, a prevalence of 63% was reported among pregnant women,²¹ 53.5% was reported among general population women in a rural area,²² and 26% was reported among men who have sex with men (MSM).²³

However, some of the results of these studies appear to contradict the results in table 10.1 and need confirmation, because the serology tests used appear to suffer from high levels of cross-reactivity with herpes simplex virus type 1 (HSV-1) antibodies and use of nonspecific serologic assays.²⁴ HSV-1 infection is predominantly transmitted orally (not sexually), has a very high prevalence in MENA,²⁵ and shows extensive sequence homology with HSV-2.²⁶

¹⁹ Abuharfeil and Meqdam, "Seroepidemiologic Study."

²⁰ Ghazi, Telmesani, and Mahomed, "TORCH Agents in Pregnant Saudi Women."

²¹ Duran et al., "Asymptomatic Herpes."

²² Maral et al., "Seroprevalences of Herpes."

²³ Cengiz et al., "Detection of Herpes"; Cengiz et al., "Demonstration of Herpes."

²⁴ Ashley et al., "Inability of Enzyme Immunoassays to Discriminate"; R. Ashley, personal communication (2007); Abu-Raddad et al., "HSV-2 Serology."

²⁵ Smith and Robinson, "Age-Specific Prevalence of Infection"; Cowan et al., "Seroepidemiological Study."

²⁶ R. Ashley, personal communication (2007); H. Weiss, personal communication (2007).

The type of tests conducted for HSV-2 serology in these studies was not able to be confirmed or clarified, despite repeated attempts. Some of these studies also tended to convey limited knowledge of HSV-2 epidemiology.

Figure 10.1 shows the age-stratified prevalence in a study from Morocco.²⁷ The prevalence grows rather slowly for both males and females compared to other regions,²⁸ suggesting that it takes a long time after sexual debut for the risk of exposure to this STI to be appreciable in magnitude. An alternative explanation might be a changing experience of successive birth cohorts in being exposed to

HSV-2 infection in different eras.²⁹ However, this explanation seems unlikely because recent trends suggest increasing, rather than declining, sexual risk behaviors.

Implications, limitations, and future applications

The above data suggest that HSV-2 prevalence in the general population in MENA is low, and indeed among the lowest globally compared to other regions (table 10.2).³⁰ This provides an indication that the levels of sexual risk behavior in the general population are low and that HIV infection is likely to have limited inroads into this population. However, HSV-2 prevalence levels in populations with identifiable risk behaviors are considerable, and comparable to those in other regions, though at somewhat lower levels.³¹ This suggests the potential for HIV to spread among priority populations.

²⁷ Cowan et al., "Seroepidemiological Study."

²⁸ Smith and Robinson, "Age-Specific Prevalence of Infection"; Cowan et al., "Seroepidemiological Study."

²⁹ Burchell et al., "Chapter 6."

³⁰ O'Farrell, "Increasing Prevalence of Genital Herpes"; Smith and Robinson, "Age-Specific Prevalence of Infection"; Weiss, "Epidemiology of Herpes"; Pebody et al., "The Seroepidemiology of Herpes"; Paz-Bailey et al., "Herpes Simplex Virus Type 2."

³¹ Smith and Robinson, "Age-Specific Prevalence of Infection."

Table 10.2 HSV-2 Prevalence in the General Population in Different Regions of the World Compared to MENA

Region	HSV-2 prevalence
Asia	10% to 30%
Europe	4% to 24%
Latin America	20% to 40%
Middle East and North Africa	0% to 15%
North America	18% to 26%
Sub-Saharan Africa	10% to 80%

Sources: O'Farrell 1999; Smith and Robinson 2002; Pebody et al. 2004; Weiss 2004; Paz-Bailey et al. 2007.

HSV-2 serology is a powerful marker of sexual risk behavior and should be a standard component in any planned or proposed surveillance efforts in MENA. HSV-2 prevalence can also help in identifying subgroups with an elevated risk of exposure to HIV that may benefit most from interventions. For example, in table 10.1, it is manifest that due to substantial HSV-2 prevalence among MSWs, FSWs, "bar girls," and STD clinic attendees, these groups are likely to be at an elevated risk of exposure to HIV and would benefit most from interventions. Given the difficulty of identifying populations at high risk in MENA, HSV-2 prevalence can be helpful in assessing the levels of risky behavior when data are limited or HIV prevalence is still at low levels, particularly among priority populations.

HSV-2 prevalence and incidence data can further be used in MENA for the evaluation of changes in sexual risk behavior or assessing the impact of interventions in different age cohorts over time.³² Rates of HSV-2 prevalence change most rapidly among adolescents and young adults, suggesting that HSV-2 can be used to gauge recent changes in risky behavior among the young age cohorts.³³ Population-based data of HSV-2 collected sequentially in time would be valuable to determine the trends of sexual risk behavior.³⁴ This is pertinent given the rapid socioeconomic changes and liberalization of culture that this region is experiencing. HSV-2

prevalence in older age cohorts may not be as informative because the infection may have been acquired long before the serology test was performed. Monitoring of HSV-2 infection should be conducted using serology tests rather than diagnosis of herpetic ulcers because up to 90% of HSV-2 infections are asymptomatic or not clinically apparent.³⁵ Furthermore, the dominant form of herpetic ulceration may not be due to HSV-2 in MENA, but to HSV-1 (orogenital transmission rather than purely genital transmission), as has been observed in Israel.³⁶

In terms of limitations, HSV-1 infection has near universal prevalence in MENA³⁷ and may have a protective effect against HSV-2 acquisition,³⁸ thereby partially contributing to the low prevalence of HSV-2 in MENA. However, the evidence for a protective effect is conflicting,³⁹ and despite high HSV-1 prevalence in most populations around the globe,⁴⁰ this has not tainted the predictive power of HSV-2 as a proxy for sexual risk behavior. Indeed, the overwhelming evidence confirms the utility of HSV-2 as a marker of risky behavior irrespective of HSV-1 prevalence.⁴¹ The near universal male circumcision coverage in MENA is also unlikely to explain the low and limited HSV-2 prevalence because male circumcision does not appear to substantially reduce HSV-2 sero-incidence.⁴²

Some of the HSV-2 research work in MENA reflects methodological limitations. HSV-2 serology tests must be conducted carefully to avoid cross-reactivity with HSV-1 infection. Serological assays need to be validated in different populations

³⁵ Cowan et al., "Antibody to Herpes Simplex Virus Type 2"; Corey and Handsfield, "Genital Herpes and Public Health"; Fleming et al., "Herpes Simplex Virus Type 2."

³⁶ Samra, Scherf, and Dan, "Herpes Simplex Virus Type 1."

³⁷ Smith and Robinson, "Age-Specific Prevalence of Infection"; Cowan et al., "Seroepidemiological Study."

³⁸ Cowan et al., "Antibody to Herpes Simplex Virus Type 2"; Mertz et al., "Frequency of Acquisition."

³⁹ Cowan et al., "Seroepidemiological Study"; Brown et al., "The Acquisition of Herpes"; Langenberg et al., "A Prospective Study of New Infections with Herpes."

⁴⁰ Smith and Robinson, "Age-Specific Prevalence of Infection"; Cowan et al., "Seroepidemiological Study."

⁴¹ Obasi et al., "Antibody to Herpes Simplex Virus Type 2"; van de Laar et al., "Prevalence and Correlates of Herpes"; Cowan et al., "Antibody to Herpes Simplex Virus Type 2"; Cunningham et al., "Herpes Simplex Virus"; Cowan et al., "Seroepidemiological Study"; Dan et al., "Prevalence and Risk Factors."

⁴² Weiss et al., "Male Circumcision"; Bailey, "Scaling Up Circumcision Programmes."

³² van de Laar et al., "Prevalence and Correlates of Herpes"; Slomka, "Seroepidemiology and Control of Genital Herpes."

³³ Obasi et al., "Antibody to Herpes Simplex Virus Type 2."

³⁴ Looker, Garnett, and Schmid, "An Estimate of the Global Prevalence."

by Western blot assays (WBA), which provide the golden reference standard for measuring HSV-2 serology.⁴³ This validation appears to have been done only once in MENA on a Moroccan sample using centralized study protocols and laboratory testing.⁴⁴ This further highlights the need for research expansion and surveillance work on HSV-2 in MENA.

Analytical summary

HSV-2 prevalence levels in the general population in MENA are low, but are considerable among priority groups. The prevalence level in the general population is among the lowest globally, suggesting that levels of sexual risk behavior in this population are low. HIV infection is unlikely to have substantial inroads into this population, confirming the results of HIV prevalence and behavioral measures (chapter 7). The substantial levels in priority groups suggest a potential for HIV spread among these groups.

HSV-2 serological measurements are underused in MENA despite their utility in indicating the levels of sexual risk behavior and HIV epidemic potential in different population groups. HSV-2 serology can also be used to track the trends of sexual risk behavior among youth. HSV-2 research in MENA needs to be expanded and HSV-2 serology should be included as a standard component of every surveillance effort.

HPV AND CERVICAL CANCER LEVELS AS MARKERS OF SEXUAL RISK BEHAVIOR

Why HPV and cervical cancer?

HPV is one of the most infectious sexually transmitted viruses.⁴⁵ It is the leading cause of over 99% of all cervical cancer cases worldwide.⁴⁶ HPV is also the causative agent of anogenital warts, which cause substantial health care costs globally,⁴⁷ and HPV is a major cause of the

cancers of the vagina, vulva, and penis.⁴⁸ HPV infection is the most common STI worldwide and most sexually active individuals, even with low sexual risk behavior, are likely to be exposed to HPV during their lifetime.⁴⁹

Rates of HPV acquisition among women and men are very high following sexual debut as well as with the acquisition of new sexual partners.⁵⁰ Numerous studies have demonstrated the association between the number of lifetime sex partners and genital HPV infection,⁵¹ including studies in MENA.⁵² HPV, cervical cancer, and genital warts incidence and prevalence can be used as proxies of the levels of sexual risk behavior in the population.⁵³ HPV infection is not only associated with sexual intercourse, but also with other sexual contacts such as penile-vulvar, oral-penile, or finger-vulvar contacts.⁵⁴ HPV prevalence and cervical cancer levels appear to be particularly sensitive to the sexual behavior of the male population and, in particular, to contacts with FSWs.⁵⁵

Cervical cancer levels

A number of studies and international databases⁵⁶ have documented cervical cancer levels in MENA. Table 10.3 shows the rates of cervical cancer incidence for each of the MENA countries.⁵⁷ These numbers represent national reports and are not necessarily derived using robust methodology. Table 10.4 displays the rates at select surveillance sites derived using sound methodology.⁵⁸ Figure 10.2 depicts the age-stratified cervical cancer

⁴³ Ashley and Wald, "Genital Herpes."

⁴⁴ Patnaik et al., "Type-Specific Seroprevalence."

⁴⁵ Burchell et al., "Modeling the Sexual Transmissibility."

⁴⁶ Bosch et al., "Prevalence of Human Papillomavirus in Cervical Cancer"; Walboomers et al., "Human Papillomavirus."

⁴⁷ Lacey, Lowndes, and Shah, "Chapter 4."

⁴⁸ Munoz et al., "Chapter 1."

⁴⁹ Trottier and Franco, "The Epidemiology of Genital Human Papillomavirus Infection."

⁵⁰ Collins et al., "Proximity of First Intercourse to Menarche"; Winer et al., "Genital Human Papillomavirus Infection"; Partridge et al., "Genital Human Papillomavirus Infection in Men."

⁵¹ Baseman and Koutsky, "The Epidemiology of Human Papillomavirus Infections"; Lu et al., "Factors Associated with Acquisition and Clearance."

⁵² Chaouki et al., "The Viral Origin of Cervical Cancer"; Hassen et al., "Cervical Human Papillomavirus Infection"; Hammouda et al., "Cervical Carcinoma in Algiers."

⁵³ Trottier and Franco, "The Epidemiology of Genital Human Papillomavirus Infection"; Chuang et al., "Condyloma Acuminatum."

⁵⁴ Burchell et al., "Chapter 6."

⁵⁵ Skegg et al., "Importance of the Male Factor."

⁵⁶ IARC and WHO, <http://www.iarc.fr/>.

⁵⁷ Ferlay et al., "GLOBOCAN 2002."

⁵⁸ Curado et al., *Cancer Incidence in Five Continents*, Volume IX.

Table 10.3 Age-Standardized Rates of Cervical Cancer Incidence and Mortality (per 100,000 women per year)

Country/Region	Incidence ASR	Mortality ASR
Afghanistan	6.9	3.6
Algeria	15.6	12.7
Bahrain	8.5	4.8
Djibouti	42.7	34.6
Egypt, Arab Rep. of	9.7	7.9
Iraq	3.3	1.8
Iran, Islamic Republic of	4.4	2.4
Israel	4.6	2.3
Jordan	4.3	2.4
Kuwait	6.1	3.4
Lebanon	15.4	8.0
Libya	11.9	9.6
Morocco	13.2	10.7
Oman	6.9	3.9
Pakistan	6.5	3.6
Qatar	3.9	2.2
Saudi Arabia	4.6	2.5
Somalia	42.7	34.6
Sudan	15.4	12.7
Syrian Arab Republic	2.0	1.0
Tunisia	6.8	5.5
Turkey	4.5	2.4
United Arab Emirates	9.9	5.3
Yemen, Republic of	8.0	4.6

Source: Ferlay et al. 2004.

Note: ASR = age-standardized rates.

incidence in select MENA populations compared to the global average.⁵⁹

Globally, the incidence of cervical cancer per country varies widely with rates ranging from 3 to 61 per 100,000 women per year.⁶⁰ As evident in the table, the rates in MENA are mostly low, and, in fact, the list of the lowest seven cervical cancer rates in the world (Syrian Arab Republic, Iraq, Turkey, Azerbaijan, Jordan, the Republic of Yemen, and Saudi Arabia) includes five MENA countries.⁶¹ The Middle Eastern region has the lowest cervical cancer incidence rate of all regions at 5.6 per 100,000 women per year.⁶² Of the distribution by predominant religion, Muslim states have the lowest cervical cancer rates at 15.6 per 100,000 women per year.⁶³ The lowest recorded incidence rate of cervical cancer worldwide is 0.4 per 100,000 women per year

⁵⁹ Parkin et al., *Cancer Incidence in Five Continents*, Vol. VIII.

⁶⁰ Drain et al., "Determinants of Cervical Cancer Rates."

⁶¹ Ibid.

⁶² Ibid.

⁶³ Ibid.

Table 10.4 Age-Standardized Rates of Cervical Cancer Incidence and Mortality at Specific Surveillance Sites or Population Groups (per 100,000 women per year)

Country	ASR
Algeria	
Setif	11.6
Egypt, Arab Rep. of	
Gharbiah	2.1
Tunisia	
Centre, Sousse	7.1
Bahrain	
Bahraini	6
Israel	
Non-Jews	2.4
Kuwait	
Kuwaitis	4.5
Non-Kuwaitis	5.3
Malaysia	
Penang	17.9
Sarawak	15.9
Oman	
Omani	6.5
Pakistan	
South Karachi	7.5
Singapore	
Malay	7.3
Turkey	
Antalya	4.4
Izmir	5.4

Source: Curado et al. 2007.

Note: Rates derived using robust methodology; ASR = age-standardized rates.

in Ardabil, Islamic Republic of Iran.⁶⁴ Data from MENA also show a generally low prevalence of cervical intraepithelial neoplasia, the precursor to cervical cancer.⁶⁵

Nonetheless, there is substantial variability in the region, with Djibouti and Somalia recording relatively high levels of cervical cancer. Cervical cancer is the most common cancer in Somalia among women,⁶⁶ just as it is the most common cancer in developing countries.⁶⁷ It is the second

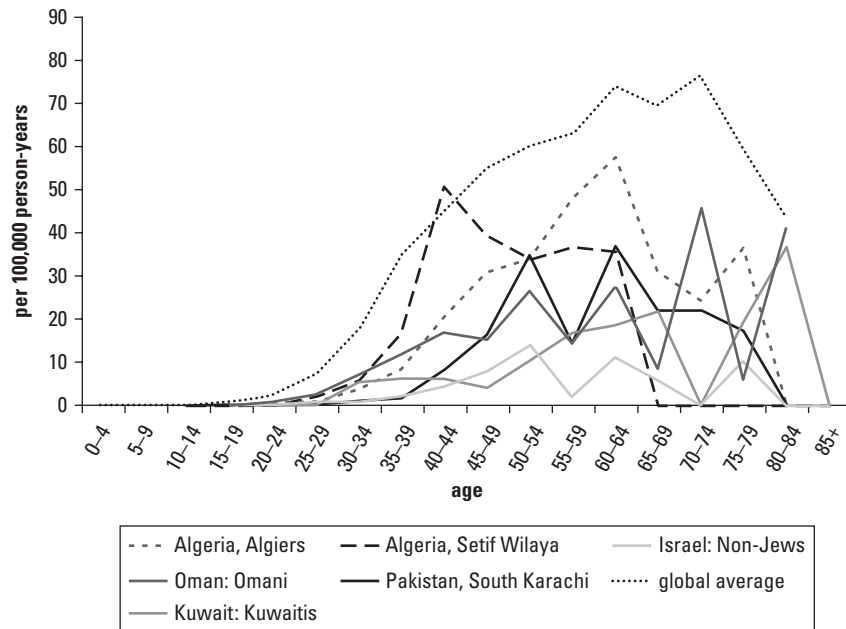
⁶⁴ Sadjadi et al., "Cancer Occurrence in Ardabil."

⁶⁵ El-Ali, Refaat, and Dandash, "Prevalence of Cervical Neoplastic Lesions"; Hammad, Jones, and Zayed, "Low Prevalence of Cervical Intraepithelial Neoplasia"; Komoditi, "Cervical and Corpus Uterine Cancer"; Altaf, "Pattern of Cervical Smear Cytology."

⁶⁶ Elattar, "Cancer in the Arab World."

⁶⁷ WHO, "Human Papillomavirus and HPV Vaccination."

Figure 10.2 Age-Stratified Cervical Cancer Incidence in Select MENA Populations Compared to the Global Average



Source: Parkin et al. 2002.

most common cancer in Algeria,⁶⁸ Morocco,⁶⁹ and Tunisia,⁷⁰ but not one of the five leading cancers among women in Egypt, Jordan, Kuwait, Lebanon, and Saudi Arabia.⁷¹ Cervical cancer accounts for 28.4% of cancer cases in Somalia, 16.3% in Algeria, 14.7% in Morocco, and 8.6% in Tunisia, but accounts for less than 6% in Egypt, Iraq, Kuwait, Lebanon, Saudi Arabia, and the Republic of Yemen.⁷² In Jordan, cervical cancer accounts for only 2% of female cancers, ranking 13th to 16th among female cancers in the years 2000 to 2004.⁷³

HPV prevalence levels

A number of studies have documented HPV prevalence in different population groups. Table 10.5 lists a summary of these studies as measured by DNA detection. These results suggest low-to-intermediate prevalence levels compared to other settings worldwide.⁷⁴ Yet,

⁶⁸ Elattar, "Cancer in the Arab World."

⁶⁹ Chaouki et al., "The Viral Origin of Cervical Cancer."

⁷⁰ Elattar, "Cancer in the Arab World."

⁷¹ Ibid.

⁷² Ibid.

⁷³ Jordan National Cancer Registry, *Cancer Incidence in Jordan*; Mahafzah et al., "Prevalence of Sexually Transmitted Infections."

⁷⁴ Curado et al., *Cancer Incidence in Five Continents*; Drain et al., "Determinants of Cervical Cancer Rates."

prevalence levels are considerable and suggest significant HPV infection transmission in MENA.⁷⁵ Some studies found high levels of HPV infection, such as in Saudi Arabia,⁷⁶ despite low levels of cervical cancer in this country.⁷⁷ There is a question as to whether some of these studies are representative of women in the general population and whether they reflect prevalence of cancerous HPV types or not.⁷⁸ Well over a hundred HPV types have been identified, with only a minority of them being sexually transmitted.⁷⁹

A few HPV and cervical cancer studies in MENA indicated an association between level of HPV prevalence (or cervical cancer) and socioeconomic status, including rural versus urban environment, type of household and occupation, and hygiene, sanitation, income, and education levels.⁸⁰ It is not clear what drives this association and whether it reflects a higher sexual risk behavior with lower socioeconomic status or not.

Implications, limitations, and future applications

HPV and cervical cancer levels in MENA suggest that the average level of sexual risk behavior in MENA populations is considerably less than that in other regions of the globe. However, there is substantial heterogeneity of HPV and cervical cancer levels, indicating variability of sexual risk behavior within MENA. It appears that countries closest to sub-Saharan Africa have the highest levels of risky behavior followed by the Maghreb countries in the western part of MENA. The lowest

⁷⁵ Munoz et al., "Chapter 1."

⁷⁶ Al-Muammar et al., "Human Papilloma Virus-16/18 Cervical Infection."

⁷⁷ Jamal and Al-Maghrabi, "Profile of Pap Smear Cytology."

⁷⁸ Hamkar et al., "Prevalence of Human Papillomavirus."

⁷⁹ Baseman and Koutsky, "The Epidemiology of Human Papillomavirus Infections"; R. Barnabas, personal communication (2007); P. Drain, personal communication (2007); L. Koutsky, personal communication (2007).

⁸⁰ Roudi-Fahimi and Ashford, "Sexual & Reproductive Health"; Chaouki et al., "The Viral Origin of Cervical Cancer"; Hammouda et al., "Cervical Carcinoma in Algiers."

Table 10.5 HPV Prevalence in Different Population Groups in MENA

Country	HPV prevalence
Algeria	12.4% (controls in a hospital-based, case control study; Hammouda et al. 2005)
Bahrain	11.0% (women attending health facilities; Hajjaj et al. 2006)
Egypt, Arab Republic of	3.0% (community-based household survey; El-All, Refaat, and Dandash 2007) 15.0% (general population women; Abdel Aziz et al. 2006)
Iran, Islamic Republic of	13.0% (gynecology clinic attendees; Ghaffari et al. 2006) 9.0% (general population women; Hamkar et al. 2002) 3.0% (general population women; Farhadi 2005)
Jordan	0.0% (hospital attendees; Malkawi et al. 2004)
Lebanon	4.9% (gynecological clinic attendees; Mroueh et al. 2002)
Morocco	21.0% (controls in a hospital-based case control study; Chaouki et al. 1998)
Pakistan	33.0% (unspecified cervical specimens; Anwar et al. 1991)
Saudi Arabia	32.0% (family medical clinic attendees; Al-Muammar et al. 2007)
Tunisia	14.0% (national family population office attendees; Hassen, Remadi, and Chouchane 1999)
Turkey	8.0% (adolescent pregnant women; Yildirim, Inal, and Tinar 2005) 6.0% (low-risk hospital attendees; Ozcelik et al. 2003) 2.0% (general population women; Inal et al. 2007) 2.0% (controls in a clinic-based case control study; Cirpan et al. 2007)
West Bank and Gaza	13.0% (pregnant women; Lubbad and Al-Hindi 2007)

levels of risk appear to be in the Mashriq countries in the eastern part of the region.

The apparent differences in the levels of risk behavior across MENA may not be strictly due to substantial differences in how often people acquire new sexual partners, but may reflect the nature of sexual networks in different parts of the region. Cervical cancer rates appear to be determined by male rather than female sexual behavior.⁸¹ A leading cause of this could be contacts with sex workers and the role of commercial sex in linking individuals within sexual networks.⁸² Since HPV is very infectious and its transmission probability may be as high as 40% per coital act,⁸³ HPV can be easily transmitted between men and FSWs even after very few sex acts. Men pass this infection to their spouses who become infected despite practicing strict monogamy.

Accordingly, HPV infection levels provide a “snapshot” of sexual network connectivity in the region. The data suggest that sexual networks tend to be sparser in most countries of MENA compared to other regions, but fairly connected in other countries, perhaps through a higher fraction

of men contacting FSWs. This is illustrated in the schematic diagrams in figure 10.3. In these two sexual networks, the number of sexual partnerships is equal, but the distribution of these partnerships is different. In figure 10.3a, the network is sparse, while in figure 10.3b the network has a high degree of connectivity as people are connected to each other through contacts with a node with a large number of partners. HPV could have a high prevalence in network (b), but a much lower prevalence in network (a).

One of the limitations of using cervical cancer as a proxy for sexual risk behavior is that women develop cervical cancer close to 20 years after HPV infection, as can be seen in figure 10.4.⁸⁴ The mean age of women with cervical cancer in MENA, as well as globally, is around 50 years.⁸⁵ Current levels of cervical cancer reflect levels of exposure among women two decades earlier, which may not be predictive of current risk behavior among young men and women. There could be a cohort effect of changing risk behavior across generations in different eras.⁸⁶ Measures

⁸¹ Bosch et al., “Importance of Human Papillomavirus.”

⁸² Skegg et al., “Importance of the Male Factor.”

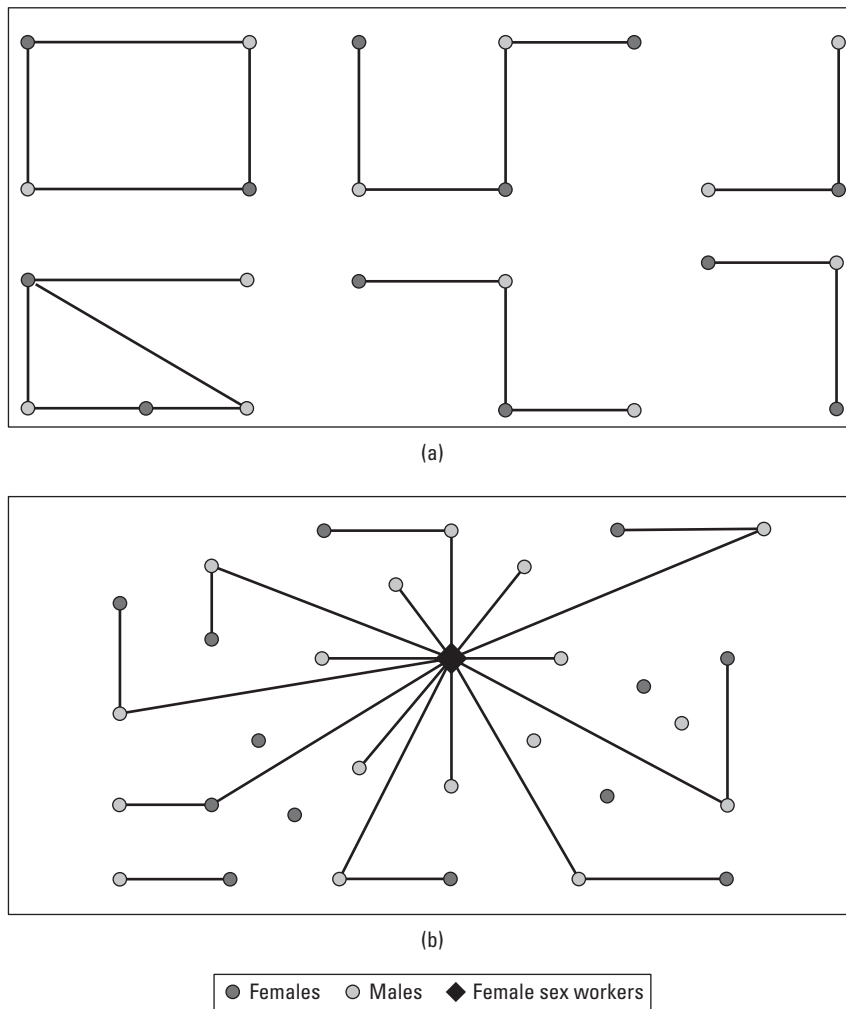
⁸³ Burchell et al., “Modeling the Sexual Transmissibility.”

⁸⁴ Schiffman and Castle, “The Promise of Global Cervical-Cancer Prevention.”

⁸⁵ Baseman and Koutsky, “The Epidemiology of Human Papillomavirus Infections”; Altaf, “Pattern of Cervical Smear Cytology.”

⁸⁶ Burchell et al., “Chapter 6.”

Figure 10.3 A Schematic Diagram of Two Different Kinds of Sexual Networks with Different Connectivity



Source: Author.

of precancerous lesions as well HPV prevalence levels may provide, when well established, better proxies of recent changes in risky behavior. There appears to be an increase in precancerous lesions due to HPV among Kuwaiti women over the years, as well as the appearance of these lesions at a younger age.⁸⁷ A similar apparent trend has been reported among women in Lebanon, particularly at younger ages.⁸⁸ The percentage of abnormal Pap smears also appears to be increasing in Saudi Arabia.⁸⁹ This may suggest an increase in

⁸⁷ Kapila et al., "Changing Spectrum of Squamous Cell Abnormalities."
⁸⁸ Karam et al., "Prevalence of Sexually Transmitted Infections."
⁸⁹ Altaf, "Cervical Cancer Screening."

sexual risk behavior among youth in MENA.

Another potential limitation to the use of HPV as a proxy measure is the role of male circumcision, which has been shown to reduce the risk of penile HPV⁹⁰ and genital warts⁹¹ and improve clearance of HPV infection among men,⁹² thereby reducing the transmission to women. This suggests that HPV prevalence in MENA could be low despite higher levels of risk behavior.

HPV levels can be used to measure recent changes in sexual risk behavior by examining increases in incidence of low-grade and high-grade precancerous lesions and cervical cancer levels among young females 20–30 years of age. HPV prevalence, as measured by direct HPV virus DNA detection, can also be an alternative powerful measure of changes in risky behavior over time.

Though low, our study suggests that levels of cervical cancer are considerable enough to warrant interventions for this health challenge. There are severe limitations in the screening programs and treatment facilities in much of the region; therefore, expansion of screening programs is recommended.⁹³ Pap smear screening appears to be at low levels, such as at 2% in Egypt⁹⁴ and 2.6% in Pakistan.⁹⁵ Cervical cancer diagnosis appears to occur in advanced stages where it is associated with a high mortality rate.⁹⁶ Despite the availability of screening infrastructure and its free cost in some resource-rich settings, such as in the United Arab Emirates, only 15.4% of women reported ever having a Pap smear test.⁹⁷

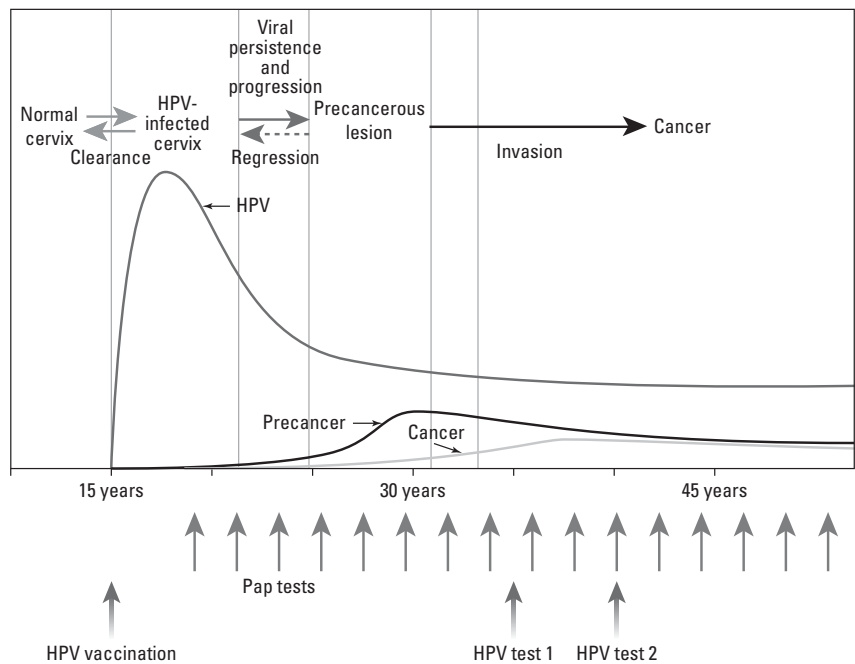
⁹⁰ Castellsague et al., "Male Circumcision."
⁹¹ Bailey, "Scaling Up Circumcision Programmes."
⁹² Lu et al., "Factors Associated with Acquisition and Clearance."
⁹³ Bennis et al., "Role of Cervical Smear."
⁹⁴ El-Ali, Refaat, and Dandash, "Prevalence of Cervical Neoplastic Lesions."
⁹⁵ Imam et al., "Perceptions and Practices."
⁹⁶ Chaouki et al., "The Viral Origin of Cervical Cancer"; Hammouda et al., "Cervical Carcinoma in Algiers."
⁹⁷ Bener, Denic, and Alwash, "Screening for Cervical Cancer."

In part, this is due to the lack of satisfactory awareness of this health issue among both the population and medical practitioners as well as the lack of a national screening policy for cervical cancer. In Pakistan, only 5% of women knew that screening was available for cervical cancer.⁹⁸ Due to the intrusive nature of the test, in conservative societies many women prefer for such a test to be administered by females.⁹⁹ In Kuwait, 78.7% of women in one study preferred that a female doctor conduct the test.¹⁰⁰

On the other hand, it appears that a rather significant proportion of women report having at least one Pap smear in their lifetime in a few countries.¹⁰¹ In a study in the Islamic Republic of Iran, 68.5% of women reported having undergone at least one Pap test.¹⁰² In a study in Kuwait, 52.3% of women knew of screening, 30.6% had a positive attitude toward it, and 23.8% had the test on a fairly routine basis.¹⁰³ There is a need to develop national policies for screening, train female nurses to conduct the screening, and increase awareness of the benefits of screening and the dangers of cervical cancer, despite the relatively low rates in MENA. Once-in-a-lifetime screening of women 30–50 years of age using Pap smears, direct visual inspection, and/or HPV DNA testing may be cost-effective in reducing the mortality of cervical cancer.¹⁰⁴

HPV vaccination should be considered as a prevention intervention for girls as well as women in MENA, and there is no need to screen for HPV before offering the vaccine because only very few women would have been infected by all four leading cancerous HPV types.¹⁰⁵ The available vaccines protect against the dominant types that cause cervical cancer in MENA (mainly

Figure 10.4 The Natural History of HPV Infection and Cervical Cancer



Source: Schiffman and Castle 2005.

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types 16 and 18).¹⁰⁶ It also appears that there is a positive attitude toward HPV vaccination in at least a few Muslim societies.¹⁰⁷

Vaccination can reduce the need for Pap smear screening by reducing the age of initiation of screening or its frequency.¹⁰⁸ Considering that screening is limited in MENA, vaccination may offer a cost-effective method to reduce cervical cancer mortality. In Brazil, a middle-income country similar to many countries in MENA, it was estimated that vaccination can reduce cervical cancer incidence by 43%.¹⁰⁹ Combining vaccination with three screening events per lifetime can reduce the incidence by 61%.¹¹⁰ Several countries in MENA can easily afford such vaccination programs, while other countries should pursue arrangements with vaccine providers to reduce the cost of vaccination and make it affordable to them. In addition to

⁹⁸ Imam et al., "Perceptions and Practices."

⁹⁹ Bener, Denic, and Alwash, "Screening for Cervical Cancer."

¹⁰⁰ Al Sairafi and Mohamed, "Knowledge, Attitudes, and Practice."

¹⁰¹ Chaouki et al., "The Viral Origin of Cervical Cancer"; Hammouda et al., "Cervical Carcinoma in Algiers."

¹⁰² Allahverdi-pour and Emami, "Perceptions of Cervical Cancer."

¹⁰³ Al Sairafi and Mohamed, "Knowledge, Attitudes, and Practice."

¹⁰⁴ Goldie et al., "Policy Analysis of Cervical Cancer Screening."

¹⁰⁵ WHO, "Human Papillomavirus and HPV Vaccination."

¹⁰⁶ Chaouki et al., "The Viral Origin of Cervical Cancer"; Hassen et al., "Cervical Human Papillomavirus Infection"; Hammouda et al., "Cervical Carcinoma in Algiers"; Lalaoui et al., "Human Papillomavirus DNA"; Khair et al., "Molecular Detection."

¹⁰⁷ Baykal et al., "Knowledge and Interest."

¹⁰⁸ WHO, "Human Papillomavirus and HPV Vaccination."

¹⁰⁹ Ibid.

¹¹⁰ Ibid.

protection against cervical cancer, the vaccines, especially the quadrivalent one, may partially protect against genital warts, cancers of the neck, head, anus, vagina, and vulva as well as recurrent respiratory papillomatosis. Even in settings with low HPV prevalence, HPV vaccination has been shown to be cost-effective, very cost-effective, and cost saving, provided the cost per dose can be reduced to \$96.85, \$50.42, and \$27.20, respectively.¹¹¹ However, a detailed cost-effectiveness analysis that takes into account the diversity of settings in this region needs to be conducted.

Increasing the level of awareness of cervical cancer and screening may pose challenging ethical issues in conservative cultures.¹¹² Though women are likely to welcome the possible introduction of HPV testing, they may not be fully aware of the sexually transmitted nature of cervical cancer. This may cause anxiety, confusion, and stigma about HPV as an STI and may raise concerns about women's sexual relationships in terms of trust, fidelity, blame, and protection.¹¹³ Participation in HPV testing may communicate messages of distrust, infidelity, and promiscuity to women's partners, family, and community. These issues should be dealt with in any expansion of HPV testing and awareness in the region. Any anxieties concerning screening should not cause women to forgo screenings.¹¹⁴

Analytical summary

Cervical cancer and HPV prevalence levels in MENA are generally lower than those in other regions, suggesting lower levels of sexual risk behavior and limited connectivity of sexual networks. HIV infection is unlikely to have major inroads into the general population in MENA, confirming the results of HIV prevalence and behavioral measures (chapter 6).

Nevertheless, there is substantial heterogeneity of cervical cancer and HPV prevalence levels indicating variability of sexual risk behavior within MENA. It appears that countries closest to sub-Saharan Africa have the highest levels of

risky behavior followed by the Maghreb countries in the western part of MENA. The lowest levels of risk behavior appear to be in the Mashriq countries in the eastern part of the region. These differences may merely reflect differences in the sizes of commercial sex networks and the fraction of men who have sexual contact with FSWs.

Low-grade and high-grade precancerous cervical lesions and HPV prevalence levels can be used in MENA to monitor trends of sexual risk behavior, particularly among youth.

There are severe limitations in HPV screening programs in MENA, and HPV vaccination is virtually nonexistent. Public health authorities need to consider expansion of screening and vaccination programs and the formulation of national screening and vaccination policies.

BACTERIAL STIs AS MARKERS OF SEXUAL RISK BEHAVIOR

In a fashion similar to the use of HSV-2 and HPV to map levels of sexual risk behavior, prevalence levels of bacterial STIs, including syphilis, gonorrhea, and chlamydia, were used to map the presence of sexual risk behaviors. Bacterial STIs are mainly prevalent among populations with high-risk practices, or their partners, and are not common among general population groups.¹¹⁵ Bacterial STI prevalence levels are specifically indicative of the presence of high-risk behaviors in a small part of the population, compared to HPV and HSV-2 infections, which may propagate in populations with intermediate or even relatively low-risk behaviors.

Different studies have documented bacterial STI prevalence in different population groups. Tables 10.6, 10.7, and 10.8 list summaries of these prevalence levels. These measures suggest that bacterial STIs are present in MENA and are common among priority populations. Nevertheless, prevalence levels outside of priority populations are generally low, and possibly reflect exposures among sexual partners of priority or bridging populations.

In addition to the data in the tables, further data suggest that bacterial STIs are present in

¹¹¹ Ginsberg et al., "Cost-Utility Analysis."

¹¹² Matin and LeBaron, "Attitudes toward Cervical Cancer"; Shafiq and Ali, "Sexually Transmitted Infections in Pakistan."

¹¹³ McCaffery et al., "Attitudes towards HPV Testing."

¹¹⁴ Azaiza and Cohen, "Between Traditional and Modern Perceptions."

¹¹⁵ Brunham and Plummer, "A General Model."

Table 10.6 Syphilis Prevalence in Different Population Groups

Country	Syphilis prevalence
Afghanistan	0.0% (ANC attendees; Todd et al. 2007; Todd et al. 2008) 1.1% (blood donors; Afghanistan Central Blood Bank 2006) 2.2% (IDUs; Todd et al. 2007)
Algeria	0.8% (pregnant women; Alami 2009) 0.8% (pregnant women; Alami 2009) 0.53% (pregnant women; Aidaoui, Bouzbid, and Laouar 2008) 3.62% (ANC attendees; Unknown, Statut de la réponse nationale) 2.3% (STI clinic attendees; Alami 2009) 5.8% (STI clinic attendees; Alami 2009) 11.9% (FSWs; Alami 2009) 8.4% (FSWs; Alami 2009)
Djibouti	0.0% (high school students; Rowe 2007) 3.1% (pregnant women; WHO and EMRO 1998) 4.0% (ANC attendees; Unknown 2002) 0.4% (blood donors; Massenet and Bouh 1997) 41.0% (FSWs; Rowe 2007) 46.0% (FSWs; Rodier et al. 1993; Rowe 2007)
Egypt, Arab Republic of	0.05% (university students; El-Gilany and El-Fedawy 2006) 0.0% (family planning attendees; El-Sayed et al. 2002) 0.0% (ANC attendees; El-Sayed et al. 2002) 0.3% (tourism workers; El-Sayed et al. 1996) 1.0% (STD clinic attendees; El-Sayed et al. 1996) 1.0% (active syphilis; STD clinic attendees; El-Sayed et al. 1996) 1.3% (IDUs; El-Sayed et al. 2002) 5.8% (FSWs; El-Sayed et al. 2002) 7.5% (MSM; El-Sayed et al. 2002)
Iran, Islamic Republic of	0.0% (street children; Vahdani et al. 2006) 0.1% (general population; Dezfulimanesh and Tehranian 2005) 0.0% (runaways and other women seeking safe haven; Hajiabdolbaghi et al. 2007) 0.0% (blood donors; Khedmat et al. 2007)
Jordan	0.0% (symptomatic hospital attendees; Jordan Ministry of Health 2004) 0.0% (asymptomatic hospital attendees; Jordan Ministry of Health 2004) 0.0% (symptomatic hospital attendees; As'ad 2004) 0.0% (asymptomatic hospital attendees; As'ad 2004) 0.0% (symptomatic hospital attendees; Mahafzah et al. 2008) 0.0% (asymptomatic hospital attendees; Mahafzah et al. 2008)
Kuwait	0.0% (STD clinic attendees; Al-Mutairi et al. 2007)
Lebanon	0.0% (rural population; Deeb et al. 2003)
Morocco	3.4% (family planning center attendees; Ryan et al. 1998) 5.6% (symptomatic primary health care center attendees; Ryan et al. 1998) 2.8% (ANC attendees; WHO/EMRO Regional Database on HIV/AIDS) 3.0% (pregnant women; WHO/EMRO 1998) 1.0% (pregnant women; Khattabi and Alami 2005) 0.73% (pregnant women; Bennani and Alami 2006) 2.8% (general population; WHO/EMRO Regional Database on HIV/AIDS) 1.3% (blood donors; WHO/EMRO 1998) 0.4% (hotel staff; Khattabi and Alami 2005) 0.94% (hotel staff; Bennani and Alami 2006) 2.9% (seasonal female laborers; Khattabi and Alami 2005) 2.17% (seasonal female laborers; Bennani and Alami 2006) 0.0% (male laborers; Khattabi and Alami 2005) 4.51% (male laborers; Bennani and Alami 2006) 9.55% (truck drivers; Khattabi and Alami 2005)

(continued)

Table 10.6 (Continued)

Country	Syphilis prevalence
	1.9% (sailors; Khattabi and Alami 2005)
	3.37% (sailors; Bennani and Alami 2006)
	2.3% (TB patients; Khattabi and Alami 2005)
	4.0% (TB patients; Bennani and Alami 2006)
	23.0% (female prisoners; El Ghrari et al. 2007)
	7.8% (female prisoners; Khattabi and Alami 2005)
	16.39% (female prisoners; Bennani and Alami 2006)
	4.8% (male prisoners; Khattabi and Alami 2005)
	4.03% (male prisoners; Khattabi and Alami 2005)
	2.7% (female STD clinic attendees; WHO/EMRO Regional Database on HIV/AIDS)
	13.2% (STD clinic attendees; Heikel et al. 1999)
	18.4% (STD clinic attendees; Ryan et al. 1998)
	4.0% (STD clinic attendees; WHO/EMRO Regional Database on HIV/AIDS)
	3.8% (STD clinic attendees; Khattabi and Alami 2005)
	4.92% (STD clinic attendees; Bennani and Alami 2006)
	9.6% (female prisoners imprisoned for sex work; Khattabi and Alami 2005)
	11.76% (female prisoners imprisoned for sex work; Bennani and Alami 2006)
	12.1% (FSWs; Khattabi and Alami 2005)
	9.0% (FSWs; Khattabi and Alami 2005)
	13.29% (FSWs; Bennani and Alami 2006)
	17% (FSWs; WHO/EMRO Regional Database on HIV/AIDS)
Pakistan	0.4% (ANC attendees; WHO/EMRO 2007)
	0.4% (general population; WHO/EMRO Regional Database on HIV/AIDS)
	0.19%–0.57% (blood donors; Sultan, Mehmood, and Mahmood 2007)
	9.4% (truck drivers; WHO/EMRO 2007)
	1%–4% (truck drivers; Pakistan National AIDS Control Program 2005a)
	7.0% (persons arrested for drug-related crimes; Baqi 1995)
	4%–18% (IDUs; Pakistan National AIDS Control Program 2005a)
	11.0% (IDUs; WHO/EMRO Regional Database on HIV/AIDS)
	7.6% (IDUs; Platt et al. 2009)
	3.9% (IDUs; Platt et al. 2009)
	23.5% (FSWs; WHO/EMRO 2007)
	4–7% (FSWs; Pakistan National AIDS Control Program 2005a)
	1.2% (FSWs; Hawkes et al. 2009)
	2.8% (FSWs; Hawkes et al. 2009)
	6–36% (MSWs; Pakistan National AIDS Control Program 2005a)
	21% (MSWs; WHO/EMRO Regional Database on HIV/AIDS)
	11%–60% (<i>hijras</i> ; Pakistan National AIDS Control Program 2005a)
	50.0% (<i>hijras</i> ; Khan et al. 2008)
	36.0% (<i>hijras</i> ; WHO/EMRO Regional Database on HIV/AIDS)
	4.7% (MSWs; <i>banthas</i> ; Hawkes et al. 2009)
	4.9% (MSWs; <i>banthas</i> ; Hawkes et al. 2009)
	9.6% (MSWs; <i>khotkis</i> ; Hawkes et al. 2009)
	0.0% (MSWs; <i>khotkis</i> ; Hawkes et al. 2009)
	48.8% (MSWs; <i>khusras</i> ; Hawkes et al. 2009)
	37.5% (MSWs; <i>khusras</i> ; Hawkes et al. 2009)
Qatar	1.1% (blood donors; WHO/EMRO 1998)
Somalia	2.0% (ANC attendees; Somaliland Ministry of Health and Labour 2007)
	1.4% (ANC attendees; Somaliland Ministry of Health and Labour 2007)
	3.6% (ANC attendees; Somaliland Ministry of Health and Labour 2007)
	0.0% (ANC attendees; Somaliland Ministry of Health and Labour 2007)
	2.4% (ANC attendees; Somaliland Ministry of Health and Labour 2007)
	1.8% (ANC attendees; Somaliland Ministry of Health and Labour 2007)

Table 10.6 (Continued)

Country	Syphilis prevalence
	3.0% (general population; Ismail et al. 1990)
	5.2% (miscellaneous individuals; Scott et al. 1991)
	1.0% (active syphilis; Somali ANC refugee attendees in Kenya; UNHCR 2006–07)
	4.4% (active syphilis; Somali ANC refugee attendees in Kenya; UNHCR 2006–07)
	1.6% (active syphilis; Somali ANC refugee attendees in Kenya; UNHCR 2006–07)
	2.4% (active syphilis; Somali ANC refugee attendees in Kenya; UNHCR 2006–07)
	3.3% (active syphilis; Somali ANC refugee attendees in Kenya; UNHCR 2006–07)
	3.8% (active syphilis; Somali ANC refugee attendees in Kenya; UNHCR 2006–07)
	0.9% (active syphilis; Somali ANC refugee attendees in Kenya; UNHCR 2006–07)
	2.7% (active syphilis; Somali ANC refugee attendees in Kenya; UNHCR 2006–07)
	1.0% (active syphilis; Somali refugees attending STI clinic in Kenya; UNHCR 2006–07)
	4.7% (active syphilis; Somali refugees attending STI clinic in Kenya; UNHCR 2006–07)
	1.3% (active syphilis; Somali refugees attending STI clinic in Kenya; UNHCR 2006–07)
	2.3% (active syphilis; Somali refugees attending STI clinic in Kenya; UNHCR 2006–07)
	2.0% (female STD clinic attendees; WHO 2004)
	0.0% (male STD clinic attendees; WHO 2004)
	1.4% (STD clinic attendees; Somaliland Ministry of Health and Labour 2007)
	10.0% (STD clinic attendees; Ismail et al. 1990)
	12.6% (STD clinic attendees; Scott et al. 1991)
	18.0% (a group of FSWs, STD clinic attendees, male soldiers, and tuberculosis patients; Watts et al. 1994)
	69.0% (FSWs; Ahmed et al. 1991)
	10.0% (FSWs; Corwin et al. 1991)
	5.6% (FSWs; Corwin et al. 1991)
	50.8% (FSWs; Scott et al. 1991)
	3.1% (Testa and Kriitmaa 2009)
Sudan	0.9% (randomly sampled women in a suburban community; Kafi, Mohamed, and Musa 2000)
	2.4% (pregnant women; WHO/EMRO 1998)
	2.0% (ANC attendees; Sudan National AIDS/STIs Program 2008)
	11.2% (ANC attendees; Southern Sudan; Southern Sudan AIDS Commission 2007)
	0%–27% (various locations; ANC attendees; Southern Sudan; Southern Sudan AIDS Commission 2007)
	4.4% (active syphilis; Sudanese ANC refugee attendees in Kenya; UNHCR 2006–07)
	5.6% (blood donors; Sudan National AIDS Program 2008)
	1.8% (refugees; Sudan National AIDS/STIs Program 2008)
	11.0% (female Sudanese refugees in Ethiopia; Holt et al. 2003)
	26.0% (male Sudanese refugees in Ethiopia; Holt et al. 2003)
	6.3% (active syphilis; Sudanese refugees attending STI clinic in Kenya; UNHCR 2006–07)
	17.0% (a population of FSWs, soldiers, truck drivers, outpatients, and Ethiopian refugees; McCarthy et al. 1989)
Turkey	0.1% (engaged couples; Alim et al. 2009)
	0.168% (blood donors; Coskun et al. 2008)
	5.38% (FSWs; Gul et al. 2008)
Yemen, Republic of	2.0% (general population; WHO/EMRO Regional Database on HIV/AIDS)
	4.9% (FSWs; Štulhofer and Božicevic 2008)

MENA and are common among priority populations. It is estimated that the general prevalence of syphilis in MENA is at 1%.¹¹⁶ In Afghanistan, a 15-fold increase in syphilis prevalence was reported among blood donors from 2002 to 2003, apparently due to a massive influx of refugees returning to the country.¹¹⁷ In the Islamic Republic

of Iran, almost all FSWs reported a previous history of STDs and 60% reported frequent STD infections.¹¹⁸ Among truck drivers and youth, 31.9% and 27.9% reported a previous history of STDs, respectively.¹¹⁹ In Lebanon, a large study of general population women reported a

¹¹⁶ WHO/EMRO Regional Database on HIV/AIDS.

¹¹⁷ Todd et al., "Prevalence of and Barriers to Testing."

¹¹⁸ Tehrani and Malek-Afzalip, "Knowledge, Attitudes and Practices."

¹¹⁹ Ibid.

Table 10.7 Gonorrhoea Prevalence in Different Population Groups

Country	Gonorrhoea prevalence
Djibouti	32.4% (promiscuous males; Fox et al. 1989)
Egypt, Arab Republic of	2.8% (family planning attendees; El-Sayed et al. 2002) 2.0% (ANC attendees; El-Sayed et al. 2002) 2.7% (IDUs; El-Sayed et al. 2002) 7.7% (FSWs; El-Sayed et al. 2002) 8.8% (MSM; El-Sayed et al. 2002)
Iran, Islamic Republic of	0.4% (a group of pregnant and nonpregnant women; Dezfulimanesh and Tehranian 2005) 1.0% (female prison inmates; Zangeneh 1999) 6.4% (obstetrics and gynecology clinics attendees; Chamani-Tabriz et al. 2007)
Jordan	0.7% (symptomatic hospital attendees; Jordan Ministry of Health 2004) 0.5% (asymptomatic hospital attendees; Jordan Ministry of Health 2004) 1.2% (symptomatic hospital attendees; As'ad 2004) 0.0% (asymptomatic hospital attendees; As'ad 2004) 0.6% (symptomatic hospital attendees; Mahafzah et al. 2008) 0.9% (asymptomatic hospital attendees; Mahafzah et al. 2008)
Kuwait	31.5% (STD clinic attendees; Al-Mutairi et al. 2007)
Lebanon	0.0% (rural population; Deeb et al. 2003)
Morocco	3.2% (family planning center attendees; Ryan et al. 1998) 5.4% (symptomatic primary health care center attendees; Ryan et al. 1998) 0.9% (ANC attendees; WHO/EMRO Regional Database on HIV/AIDS) 1.74% (female STD clinic attendees; Heikel et al. 1999) 0.8% (female STD clinic attendees; WHO/EMRO Regional Database on HIV/AIDS) 7.07% (male STD clinic attendees; Heikel et al. 1999) 10.0% (STD clinic attendees; Ryan et al. 1998) 42.0% (STD clinic attendees; WHO/EMRO Regional Database on HIV/AIDS) 52.4% (STD clinic attendees; Alami et al. 2002) 3.5% (FSWs; WHO/EMRO Regional Database on HIV/AIDS)
Pakistan	1%–4% (truck drivers; Pakistan National AIDS Control Program 2005a) 1%–2% (IDUs; Pakistan National AIDS Control Program 2005a) 1.3% (IDUs; Platt et al. 2009) 0.0% (IDUs; Platt et al. 2009) 10%–12% (FSWs; Pakistan National AIDS Control Program 2005a) 0%–18% (anal; MSWs; Pakistan National AIDS Control Program 2005a) 3%–6% (genital; MSWs; Pakistan National AIDS Control Program 2005a) 3%–4% (anal; <i>hijras</i> ; Pakistan National AIDS Control Program 2005a) 15.0% (anal; <i>hijras</i> ; Khan et al. 2008) 4.0% (urethral; <i>hijras</i> ; Khan et al. 2008) 12.6% (anal; MSWs; <i>banthas</i> ; Hawkes et al. 2009) 11.1% (anal; MSWs; <i>banthas</i> ; Hawkes et al. 2009) 4.7% (anal; MSWs; <i>khotkis</i> ; Hawkes et al. 2009) 0.0% (anal; MSWs; <i>khotkis</i> ; Hawkes et al. 2009) 20.2% (anal; MSWs; <i>khusras</i> ; Hawkes et al. 2009) 6.3% (anal; MSWs; <i>khusras</i> ; Hawkes et al. 2009)
Somalia	0.8% (ANC attendees; WHO 2004) 0.5% (STD clinic attendees; WHO 2004) 6.7% (STD clinic attendees; Burans et al. 1990) 11.2% (FSWs; Burans et al. 1990)
Turkey	0.0% (family planning clinic attendees; Ortayli, Bulut, and Nalbant 2001; Ortayli et al. 2001)

Table 10.8 Chlamydia Prevalence in Different Population Groups

Country	Chlamydia prevalence
Algeria	100% (antichlamydia antibodies; obstetric clinic attendees; Kadi et al. 1989) 100% (antichlamydia antibodies; FSWs; Kadi et al. 1989)
Djibouti	5.7% (promiscuous males; Fox 1989)
Egypt, Arab Republic of	2.8% (family planning attendees; El-Sayed et al. 2002) 1.3% (ANC attendees; El-Sayed et al. 2002) 2.7% (IDUs; El-Sayed et al. 2002) 7.7% (FSWs; El-Sayed et al. 2002) 8.8% (MSM; El-Sayed et al. 2002)
Iran, Islamic Republic of	8.8% (male STI clinic attendees; Darougar et al. 1982) 9.3% (male patients with urethritis; Ghanaat et al. 2008) 6.9% (FSWs; Darougar et al. 1983)
Jordan	1.3% (symptomatic hospital attendees; Jordan Ministry of Health 2004) 0.5% (asymptomatic hospital attendees; Jordan Ministry of Health 2004) 0.8% (symptomatic hospital attendees; As'ad 2004) 0.0% (asymptomatic hospital attendees; As'ad 2004) 0.9% (symptomatic hospital attendees; Mahafzah et al. 2008) 2.2% (asymptomatic hospital attendees; Mahafzah et al. 2008) 3.9% (women attending infertility clinic; Al-Ramahi et al. 2008) 0.7% (hospital attendees; Al-Ramahi et al. 2008) 4.6% (symptomatic patients with urethritis; Awwad, Al-Amarat, and Shehabi 2003) 3.9% (symptomatic patients with urethritis; Al Ramahi et al. 2008)
Kuwait	4.1% (STD clinic attendees; Al-Mutairi et al. 2007)
Lebanon	0.0% (rural population; Deeb et al. 2003)
Morocco	2.6% (family planning center attendees; Ryan et al. 1998) 6.3% (symptomatic primary health care center attendees; Ryan et al. 1998) 4.2% (ANC attendees; WHO/EMRO Regional Database on HIV/AIDS) 5.6% (female STD clinic attendees; WHO/EMRO Regional Database on HIV/AIDS) 51.5% (STD clinic attendees; Heikel et al. 1991) 6.0% (STD clinic attendees; WHO/EMRO Regional Database on HIV/AIDS) 17.1% (STD clinic attendees; Alami et al. 2002) 5.0% (STD clinic attendees; Ryan et al. 1998) 19.1% (FSWs; WHO/EMRO Regional Database on HIV/AIDS)
Pakistan	1.0% (truck drivers; Pakistan National AIDS Control Program 2005a) 0%–1% (IDUs; Pakistan National AIDS Control Program 2005a) 0.7% (IDUs; Platt et al. 2009) 0.0% (IDUs; Platt et al. 2009) 5%–11% (FSWs; Pakistan National AIDS Control Program 2005a) 10.0% (anal; MSWs; Pakistan National AIDS Control Program 2005a) 1%–2% (genital; MSWs; Pakistan National AIDS Control Program 2005a) 29.0% (anal; <i>hijras</i> ; Pakistan National AIDS Control Program 2005a) 0%–2% (genital; <i>hijras</i> ; Pakistan National AIDS Control Program 2005a) 9.0% (anal; <i>hijras</i> ; Khan et al. 2008) 1.0% (urethral; <i>hijras</i> ; Khan et al. 2008) 4.7% (anal; MSWs; <i>banthas</i> ; Hawkes et al. 2009) 4.9% (anal; MSWs; <i>banthas</i> ; Hawkes et al. 2009) 3.6% (anal; MSWs; <i>khotkis</i> ; Hawkes et al. 2009) 0.0% (anal; MSWs; <i>khotkis</i> ; Hawkes et al. 2009) 9.9% (anal; MSWs; <i>khusras</i> ; Hawkes et al. 2009) 6.3% (anal; MSWs; <i>khusras</i> ; Hawkes et al. 2009)
Saudi Arabia	0.0% (asymptomatic females attending genitourinary or gynecological clinics; Massoud et al. 1991) 2.0% (asymptomatic males attending genitourinary or gynecological clinics; Massoud et al. 1991) 35.0% (symptomatic females attending genitourinary or gynecological clinics; Massoud et al. 1991) 46.0% (symptomatic males attending genitourinary or gynecological clinics; Massoud et al. 1991)

(continued)

Table 10.8 (Continued)

Country	Chlamydia prevalence
Somalia	1.1% (ANC attendees; WHO 2004) 0.8% (STD clinic attendees; WHO 2004) 14.0% (STD clinic attendees; Ismail et al. 1990)
Sudan	1.2% (randomly sampled women in a suburban community; Kafi, Mohamed, and Musa 2000)
Turkey	1.9% (family planning clinic attendees; Ortayli et al. 2001) 1.9% (family planning clinic attendees; Ortayli, Bulut, and Nalbant 2001) 12.0% (registered FSWs; Agacfidan et al. 1997) 14.4% (unregistered FSWs; Agacfidan et al. 1997) 12.9% (FSWs; Agacfidan et al. 1997)
United Arab Emirates	2.6% (female primary and secondary care attendees; Ghazal-Aswad et al. 2004)
West Bank and Gaza	8.0% (pregnant women; Lubbad and Al-Hindi 2007)

trichomonas prevalence of 0.53%.¹²⁰ In Pakistan, 15%–45% of different risk groups, including IDUs, FSWs, MSWs, and *hijras*, reported having an STI in the past six months.¹²¹ Also in Pakistan, 3.2% of migrant workers had etiologically confirmed STI prevalence.¹²² In Sudan, 7.3% of ANC attendees were found to have multiple STIs.¹²³ It appears that gonorrhea and chlamydia are the most common bacterial STIs among MSM in MENA.¹²⁴

A few studies have also documented chancroid in MENA, a bacterial STI characteristic of very high levels of risky behavior.¹²⁵ This infection reappeared in Algeria in 1988 and was consistently associated with contacts with FSWs.¹²⁶ The infection was also common among STD clinic attendees in Kuwait.¹²⁷

The magnitude of the burden of STIs is not well known in most countries of MENA due to the limited STI surveillance. In 2002, HIV and STIs together became the second leading cause of mortality among all infectious (and parasitic) diseases among people 15–44 years old in the region.¹²⁸ It is estimated that there are 3.5 million curable (mainly bacterial) STIs every year

among adults in MENA.¹²⁹ The yearly incidence of the four leading curable STIs (gonorrhea, chlamydia, syphilis, and trichomonas) is estimated at 7% per person, per year.¹³⁰ This is the second lowest incidence rate of all regions. In Djibouti, it is estimated that there are 25,000 reported STD cases every year.¹³¹ In the Islamic Republic of Iran, 850,000 STDs are registered annually.¹³² In Morocco, between 180,000 and 240,000 new STDs used to be reported annually in the late 1990s,¹³³ but in recent years the number of reported cases has increased considerably (370,000 in 2005).¹³⁴ Figure 10.5 shows the trend in STI notified cases in Morocco from 1992 to 2006.¹³⁵ In Saudi Arabia, gonorrhea incidence was estimated at 4.9 per 100,000 persons per year,¹³⁶ compared to 131.4 per 100,000 persons per year in the United States.¹³⁷ In the Republic of Yemen, it is estimated that there are 150,000 to 170,000 new STDs per year.¹³⁸

Reproductive tract infections include, in addition to STIs, infections arising from overgrowth of natural organisms in the genital tract and infections acquired during improperly performed medical procedures such as unsafe

¹²⁰ Karam et al., "Prevalence of Sexually Transmitted Infections."

¹²¹ Pakistan National AIDS Control Program, "Report of the Pilot Study in Karachi & Rawalpindi."

¹²² Faisel and Cleland, "Migrant Men"

¹²³ Ortashi, El Khidir, and Herieka, "Prevalence of HIV."

¹²⁴ WHO/EMRO, *Strengthening Health Sector Response*.

¹²⁵ Brunham and Plummer, "A General Model"; Glasier et al., "Sexual and Reproductive Health."

¹²⁶ Boudghene-Stambouli and Merad-Boudia, "Chancroid in Algeria."

¹²⁷ Brunham and Plummer, "A General Model"; Al-Mutairi et al., "Clinical Patterns."

¹²⁸ WHO, *Shaping the Future*.

¹²⁹ WHO, "Global Prevalence and Incidence."

¹³⁰ Glasier et al., "Sexual and Reproductive Health."

¹³¹ WHO/EMRO, "Prevention and Control."

¹³² Iran Center for Disease Management, Three Month Statistics.

¹³³ Heikel et al., "The Prevalence of Sexually Transmitted Pathogens."

¹³⁴ Morocco MOH, "Situation épidémiologique actuelle du VIH/SIDA au Maroc."

¹³⁵ WHO/EMRO data reported to the WHO office of the Eastern Mediterranean Region.

¹³⁶ Madani, "Sexually Transmitted Infections in Saudi Arabia."

¹³⁷ CDC, "Tracking the Hidden Epidemics."

¹³⁸ Lambert, "HIV and Development Challenges in Yemen."

abortions.¹³⁹ Hence, caution needs to be exercised when interpreting STD data with no confirmed etiology. In a rural community in eastern Lebanon, STD prevalence was 1.2%, but there were no etiologically confirmed cases of syphilis, gonorrhea, or chlamydia.¹⁴⁰ Among general population women in Egypt, 19.7% of women self-reported STI symptoms in the previous 12 months,¹⁴¹ but given the epidemiological context of sexual risk behavior highlighted in this synthesis, it seems unlikely that the majority of these symptoms are STI related. Facilities with etiologic diagnostic methods are not widely available in MENA.¹⁴²

Analytical summary

Prevalence levels of bacterial STIs among the general population in MENA are low compared to other regions, but prevalence levels among priority populations are considerable, suggesting higher levels of sexual risk behavior. HIV infection is unlikely to have major inroads into the general population in MENA, confirming the results of HIV prevalence and behavioral measures (chapter 6). The considerable prevalence levels in priority groups suggest that there is potential for HIV spread among these groups.

UNSAFE ABORTIONS AS MARKERS OF SEXUAL RISK BEHAVIOR

Levels of unsafe abortions can be used as proxies of sexual risk behavior and may reflect levels of unprotected sexual intercourse in nonspousal partnerships. Figure 10.5 displays the rates of unsafe abortion in MENA compared to the rest of the regions.¹⁴³ Apart from Djibouti and Somalia, MENA has one of the lowest rates of unsafe abortions in the developing world. The rates are higher in the Maghreb than in the Mashriq parts of MENA, consistent with the results of STI measures.

¹³⁹ Roudi-Fahimi and Ashford, "Sexual & Reproductive Health."

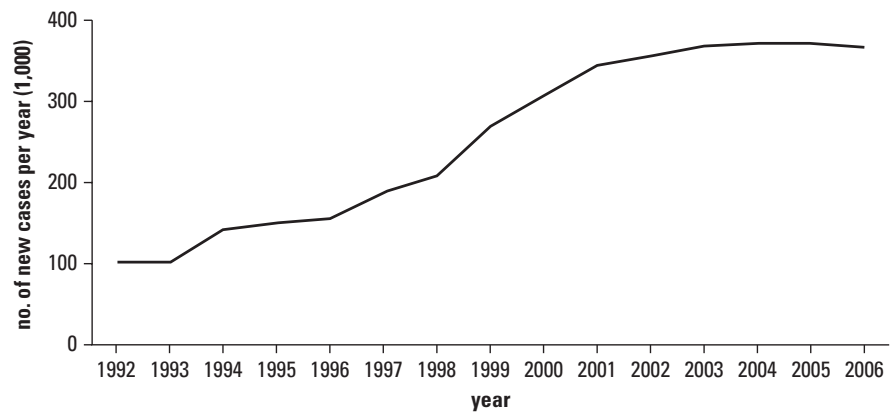
¹⁴⁰ Deeb et al., "Prevalence of Reproductive Tract Infections."

¹⁴¹ Measure DHS, "Egypt: Demographic and Health Survey 2005."

¹⁴² Ibid.

¹⁴³ WHO, *Unsafe Abortion*.

Figure 10.5 Trend in STI Notified Cases in Morocco, 1992–2006



Source: WHO/EMRO data reported to the WHO office of the Eastern Mediterranean Region.

It is estimated that about 1.5 million unsafe abortions occurred in MENA in 2003,¹⁴⁴ out of a world total of about 19 million.¹⁴⁵ Unsafe abortions account for 11% of maternal deaths in MENA,¹⁴⁶ compared to 30% of all maternal deaths globally.¹⁴⁷

Analytical summary

The fact that MENA has one of the lowest rates of unsafe abortions in the developing world suggests that levels of risk behavior are lower than those in other regions. HIV infection is unlikely to have major inroads into the general population in MENA, confirming the results of HIV prevalence and behavioral measures (chapter 6).

Nevertheless, there is substantial heterogeneity in unsafe abortion rates across MENA. Countries closest to sub-Saharan Africa have the highest levels followed by the Maghreb countries. Lower levels are found in the rest of MENA.

BIOLOGICAL EVIDENCE ON PROXY MEASURES OF SEXUAL RISK BEHAVIORS: ANALYTICAL SUMMARY

The above sections presented data on several proxy biomarkers for sexual risk behavior in different population groups in MENA. The

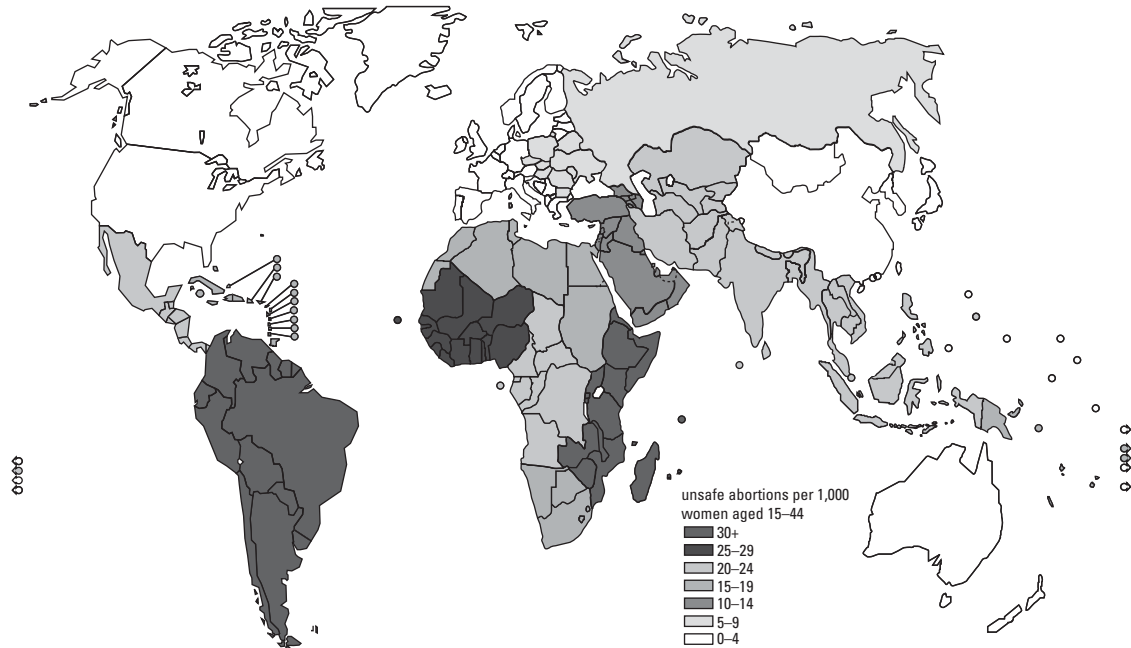
¹⁴⁴ Roudi-Fahimi and Ashford, "Sexual & Reproductive Health."

¹⁴⁵ WHO, *Unsafe Abortion*; Ahman and Shah, "Unsafe Abortion."

¹⁴⁶ Roudi-Fahimi and Ashford, "Sexual & Reproductive Health."

¹⁴⁷ Glasier et al., "Sexual and Reproductive Health."

Figure 10.6 Estimated Annual Incidence of Unsafe Abortions per 1,000 Women Aged 15–44 Years, by United Nations Subregions in 2000



The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dashed lines represent approximate border lines for which there may not yet be full agreement.

Source: Reproduced with permission from WHO (2004).

data derived from these different proxy biomarkers converge to the same conclusion: sexual risk behaviors are present in MENA; there are existing local sexual risk networks where STIs are propagating; and levels of sexual risk behavior appear to be considerable among priority groups. However, levels of risky behavior are low among the general population and overall they are among the lowest of all regions.

Sexual risk behaviors vary across MENA, with the highest levels found in countries closest to sub-Saharan Africa, followed by the Maghreb countries in the western part of MENA. The lowest levels appear to be in the Mashriq countries in the eastern part of MENA.

The evidence on the different proxy biomarkers suggests that it is unlikely that HIV infection will make major inroads into the general population in MENA, confirming the results of HIV prevalence and behavioral measures (chapter 7). However, the data on priority populations suggest that there is potential for HIV spread among these populations.

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Analytical Insights into HIV Transmission Dynamics and Epidemic Potential in MENA

Understanding the current status and future potential of the human immunodeficiency virus (HIV) epidemic is central to designing appropriate epidemic responses because surveillance efforts and the effectiveness and cost-effectiveness of interventions depend on the epidemiological context in which they are implemented.¹ This chapter discusses the analytical insights reached based on the conceptual framework described in chapter 1 and the data synthesis presented in the following chapters.

EVOLUTION OF THE HIV EPIDEMIC IN MENA

HIV found its way to the Middle East and North Africa (MENA) countries by the 1980s at the latest. Virtually all countries had reported their first HIV or AIDS (acquired immunodeficiency syndrome) case by 1990.² The majority of cases were linked to blood or blood products or exposures abroad. Transfusions of blood or blood

products were behind a large fraction of reported cases such as in the Arab Republic of Egypt,³ the Islamic Republic of Iran,⁴ Saudi Arabia,⁵ and the West Bank and Gaza.⁶ Quite often the blood or the blood products were imported.⁷

A high prevalence of blood-borne diseases was found at the time among people in need of blood or blood products. In Bahrain in the early 1990s, the prevalence of HIV among children with hereditary hemolytic anemias was 1.6%, 40% for people with hepatitis C virus (HCV), and 20.5% for people with hepatitis B virus (HBV).⁸ In Egypt, recipients of blood or blood products had an HIV prevalence of 4.8% in the period from 1986 to 1990.⁹ In Lebanon, multi-transfused patients had an HIV prevalence of 6%.¹⁰ In Qatar, more than 75% of reported HIV infections up to 1989 were acquired via transfusion of imported blood,¹¹ and 38.5% of

¹ Grassly et al., "The Effectiveness of HIV Prevention."

² Shah et al., "An Outbreak of HIV"; Ryan, "Travel Report Summary"; Jenkins and Robalino, "HIV in the Middle East and North Africa"; Al-Fouzan and Al-Mutairi, "Overview of Incidence of Sexually Transmitted Diseases in Kuwait"; Elharti et al., "Some Characteristics of the HIV Epidemic in Morocco"; Kalaajieh, "Epidemiology of Human Immunodeficiency Virus"; Iran Center for Disease Management, *HIV/AIDS and STIs Surveillance Report*; Woodruff et al., "A Study of Viral and Rickettsial Exposure"; Khanani et al., "Human Immunodeficiency Virus-Associated Disorders in Pakistan"; Toukan and Schable, "Human Immunodeficiency Virus (HIV) Infection in Jordan"; Rodier et al., "Infection by the Human Immunodeficiency Virus."

³ Faris and Shouman, "Study of the Knowledge, Attitude of Egyptian Health Care Workers."

⁴ Rao, *Strengthening of AIDS/HIV Surveillance*.

⁵ El-Hazmi and Ramia, "Frequencies of Hepatitis B"; Alrajhi, "Human Immunodeficiency Virus in Saudi Arabia"; Al-Nozha et al., "Horizontal versus Vertical Transmission."

⁶ Maayan et al., "HIV/AIDS among Palestinian Arabs"; Moses et al., "HIV Infection and AIDS in Jerusalem."

⁷ Mokhbat et al., "Clinical and Serological Study"; Novelli et al., "High Prevalence of Human Immunodeficiency Virus"; Harfi and Fakhry, "Acquired Immunodeficiency Syndrome in Saudi Arabia"; Kingston et al., "Acquired Immune Deficiency Syndrome."

⁸ Al-Mahroos and Ebrahim, "Prevalence of Hepatitis B."

⁹ Watts et al. "Prevalence of HIV Infection and AIDS."

¹⁰ Mokhbat et al., "Clinical and Serological Study."

¹¹ Milder and Novelli, "Clinical, Social and Ethical Aspects of HIV-1."

children with thalassemia were found to be HIV positive.¹² In Saudi Arabia, 1.3% of multitransfused thalassemic and sickle cell disease patients tested positive for HIV,¹³ and 34.5% of HIV-positive children became infected through blood or blood products.¹⁴

Organ transplants have also contributed to a number of HIV infections in this early phase of the epidemic. HIV infections were diagnosed among kidney transplant patients in Oman, Saudi Arabia, and the United Arab Emirates who bought kidneys from donors in Egypt and India.¹⁵ HIV prevalence was 4.3% among 540 Saudi hemodialysis patients who received a commercial kidney transplant in India.¹⁶

Although blood safety measures were not implemented satisfactorily until the late 1990s, the region nonetheless made substantial progress in reducing HIV infections due to contaminated blood, from 12.1% in 1993 to 0.4% in 2003.¹⁷ This progress, however, was not universal and some countries, such as Afghanistan and the Republic of Yemen, continued to lag behind in the screening of blood products.¹⁸ It is believed that currently only 30% of all donated blood is screened in Afghanistan.¹⁹

The majority of reported infections acquired by a mode other than blood or blood products were either related to sexual or injecting drug exposures abroad²⁰ or acquired by sexual partners of those who worked or lived abroad.²¹ This trend is not dissimilar to other regions such as in Western Europe, where the first AIDS cases

were among travelers and expatriates who worked abroad.²² However, the pattern of a large share of HIV acquisitions related to exposures abroad appears to persist in several countries. In Jordan, 450 out of 501 notified HIV/AIDS cases by 2006 were acquired abroad.²³ In Lebanon, 45.36% of notified HIV/AIDS cases up to 2004 were linked to travel abroad.²⁴ Half of reported AIDS cases in the Republic of Yemen were linked to traveling abroad.²⁵

The travel-related exposures were from multiple destinations. In Lebanon, a considerable number of HIV/AIDS cases were found among returning migrants who resided in western and Central Africa.²⁶ In the West Bank and Gaza, HIV cases appeared among migrant workers working legally or illegally in Israel.²⁷ In Oman, a number of HIV cases were related to Omani historical links to East Africa.²⁸ In Pakistan, the majority of cases were acquired through contacts with female sex workers (FSWs) while working in the Persian Gulf region.²⁹ In Tunisia, HIV infections were found among Tunisian injecting drug users (IDUs) deported from France.³⁰ Generally, HIV infections in Maghreb countries were linked to exposures in Western Europe.³¹

A number of HIV sero-prevalence studies that were conducted in MENA in the 1980s and early 1990s included Djibouti,³² Egypt,³³ the Islamic Republic of Iran,³⁴ Jordan,³⁵ Lebanon,³⁶

¹² Novelli et al., "High Prevalence of Human Immunodeficiency Virus."

¹³ El-Hazmi and Ramia, "Frequencies of Hepatitis B."

¹⁴ Kordy et al., "Human Immunodeficiency Virus Infection."

¹⁵ Alrajhi, Halim, and Al-Abdely, "Mode of Transmission of HIV-1"; Salahudeen et al., "High Mortality among Recipients"; Aghanashinikar et al., "Prevalence of Hepatitis B."

¹⁶ Anonymous, "Commercially Motivated Renal Transplantation."

¹⁷ UNAIDS, "Notes on AIDS in the Middle East and North Africa."

¹⁸ WHO/EMRO, "Progress Report on HIV/AIDS and '3 by 5.'"

¹⁹ Global Fund, Afghanistan Proposal, www.theglobalfund.org/search/docs/4AFGT_764_Q_full.pdf.

²⁰ Iqbal and Rehan, "Sero-Prevalence of HIV"; Ryan, "Travel Report Summary"; Kayani et al., "A View of HIV-1 Infection in Karachi"; Toukan and Schable, "Human Immunodeficiency Virus (HIV) Infection in Jordan"; Faris and Shouman, "Study of the Knowledge"; Maayan et al., "HIV/AIDS among Palestinian Arabs"; Naman et al., "Seroepidemiology of the Human Immunodeficiency Virus"; Dan, Rock, and Bar-Shany, "Prevalence of Antibodies"; Jemni et al., "AIDS and Tuberculosis in Central Tunisia."

²¹ Tiouiri et al., "Study of Psychosocial Factors"; "Global Update: Morocco."

²² Hawkes et al., "Risk Behaviour."

²³ Jordan National AIDS Program, personal communication.

²⁴ Jurjus et al., "Knowledge, Attitudes, Beliefs, and Practices."

²⁵ WHO, UNICEF, and UNAIDS, "Yemen, Epidemiological Facts Sheets."

²⁶ Jenkins and Robalino, "HIV in the Middle East and North Africa."

²⁷ UNAIDS, "Key Findings on HIV Status in the West Bank and Gaza."

²⁸ Tawilah and Tawil, *Visit to Sultane of Oman*.

²⁹ Shah et al., "HIV-Infected Workers Deported"; Baqi, Kayani, and Khan, "Epidemiology and Clinical Profile"; Khan et al., "HIV-1 Subtype A Infection."

³⁰ Jenkins and Robalino, "HIV in the Middle East and North Africa."

³¹ "Global Update: Morocco."

³² Rodier et al., "HIV Infection among Secondary School Students."

³³ Watts et al., "Prevalence of HIV Infection and AIDS"; El-Ghazzawi, Hunsman, and Schneider, "Low Prevalence of Antibodies"; Constantine et al., "HIV Infection in Egypt"; Kandela, "Arab Nations: Attitudes to AIDS."

³⁴ Arbesser, Bashiribod, and Sixl, "Serological Examinations of HIV-1 in Iran."

³⁵ Al Katheeb, Tarawneh, and Awidi, "Antibodies to HIV."

³⁶ Naman et al., "Seroepidemiology of the Human Immunodeficiency Virus."

Libya,³⁷ Mauritania,³⁸ Pakistan,³⁹ Saudi Arabia,⁴⁰ Somalia,⁴¹ Sudan,⁴² Turkey,⁴³ the West Bank and Gaza,⁴⁴ and the Republic of Yemen.⁴⁵ These studies included tens of thousands of blood samples from populations including pregnant women, healthy women, healthy men, neonates, drug users, IDUs, FSWs, sexually transmitted disease (STD) patients, prisoners, truck drivers, soldiers, refugees, leprosy patients, outpatients, hospital patients, and blood or blood product donors and recipients.

In almost all of these surveys, few HIV infections were identified, if any. HIV prevalence was consistently at very low levels even in priority groups. The vast majority of diagnosed cases were linked to HIV exposures abroad, blood or blood products, or organ transplants. Nevertheless, a new pattern of HIV infectious spread started to appear in MENA by the early 1990s. HIV found its way to some of the high-risk networks in a few countries. Growing HIV prevalence was identified among a number of priority populations.

A classic example highlighting this emerging pattern is the epidemic in Djibouti. The first reported AIDS case was in 1986.⁴⁶ Although HIV prevalence was still nil in general population groups, such as high school students,⁴⁷ it was growing rapidly along the complex network of commercial sex. HIV prevalence among street-based FSWs, the most vulnerable of sex workers, increased tenfold from 4.6% in 1987 to 41.7% in 1990.⁴⁸ By the early 1990s, HIV prevalence among these sex workers appeared to be

at levels as high as 70%.⁴⁹ The epidemic among bar-based FSWs was also growing rapidly;⁵⁰ over this period, it was documented by individual studies to be 1.4%,⁵¹ 2.7%,⁵² 5%,⁵³ 7%,⁵⁴ 14.2%,⁵⁵ 15.3%,⁵⁶ 21.7%,⁵⁷ and 25.6%.⁵⁸

While HIV prevalence was stabilizing among FSWs by about 1990,⁵⁹ it was rising rapidly among their clients. The HIV prevalence among STD clinic attendees increased fivefold between 1990 and 1991 and reached 10.4%.⁶⁰ HIV infection then found its way to spouses of clients of FSWs and their children through mother-to-child transmission. HIV prevalence was rising among the spouses, but at a slower rate, and reached levels of about 5% by the late 1990s and has remained stable at about this level since then.⁶¹

Women from the general population in Djibouti were the dam at which the tide of HIV spread was absorbed and then stopped. Being at the receiving end, they carried a higher overall HIV prevalence than men (3.6% versus 3.1% in Djibouti-ville and 1.7% versus 0.3% in the rest of the country⁶²). However, it does not appear that they engaged in much risk behavior and it seems that they rarely spread the infection further. This limited further inroads of HIV into the population. HIV prevalence appears to have leveled off at about 3% nationally since the late 1990s.⁶³ Although Djibouti was predicted to have a skyrocketing epidemic a decade ago, this has not materialized.⁶⁴ HIV may have already traveled along the contours of risk and vulnerability in this country and saturated its potential.

³⁷ Giasuddin et al., "Failure to Find Antibody."

³⁸ Lepers et al., "Sero-Epidemiological Study in Mauritania."

³⁹ Mujeeb and Hafeez, "Prevalence and Pattern of HIV"; Mujeeb et al., "Prevalence of HIV-Infection among Blood Donors."

⁴⁰ Al Rasheed et al., "Screening for HIV Antibodies."

⁴¹ Jama et al., "Sexually Transmitted Viral Infections"; Burans et al., "HIV Infection Surveillance in Mogadishu"; Ismail et al., "Sexually Transmitted Diseases in Men"; Fox et al., "AIDS."

⁴² Burans et al., "Serosurvey of Prevalence"; McCarthy et al., "Hepatitis B and HIV in Sudan"; Hashim et al., "AIDS and HIV Infection in Sudanese Children."

⁴³ Rota et al., "HIV Antibody Screening"; Demiroz et al., "HIV Infections among Turkish Citizens."

⁴⁴ Maayan et al., "HIV-1 Prevalence."

⁴⁵ Leonard et al., "Prevalence of HIV Infection."

⁴⁶ Rodier et al., "Infection by the Human Immunodeficiency Virus."

⁴⁷ Rodier et al., "HIV Infection among Secondary School Students."

⁴⁸ Rodier et al., "Trends of Human Immunodeficiency Virus"; Rodier et al., "Infection by the Human Immunodeficiency Virus."

⁴⁹ Etchepare, "Programme National de Lutte"; Rodier et al., "Trends of Human Immunodeficiency Virus"; Marcelin et al., "Comparative Study."

⁵⁰ Couzineau et al., "Prevalence of Infection."

⁵¹ Etchepare, "Programme National de Lutte."

⁵² Ibid.

⁵³ Ibid.

⁵⁴ Marcelin et al., "Comparative Study."

⁵⁵ Etchepare, "Programme National de Lutte."

⁵⁶ Rodier et al., "Trends of Human Immunodeficiency Virus"; Rodier et al., "Infection by the Human Immunodeficiency Virus."

⁵⁷ Etchepare, "Programme National de Lutte."

⁵⁸ Ibid.

⁵⁹ Rodier et al., "Infection by the Human Immunodeficiency Virus."

⁶⁰ Rodier et al., "Trends of Human Immunodeficiency Virus"; Rodier et al., "Infection by the Human Immunodeficiency Virus."

⁶¹ Marcelin et al., "Kaposi's Sarcoma Herpesvirus."

⁶² WHO, "Summary Country Profile."

⁶³ UNAIDS, "Notes on AIDS in the Middle East and North Africa"; Djibouti (Ministère de La Santé de) and Association Internationale de Développement, *Tome I*; Maslin et al., "Epidemiology and Genetic Characterization."

⁶⁴ O'Grady, "WFP Consultant Visit to Djibouti Report."

In the Islamic Republic of Iran, the first HIV/AIDS case among IDUs was reported in 1992.⁶⁵ Only a few cases were reported per year in the three following years.⁶⁶ However, starting from 1996, the number of reported cases suddenly rose by thirtyfold.⁶⁷ The first reported outbreak was in 1996 in the prisons of Kerman and Kermanshah.⁶⁸ By 2000, the prevalence remained under 1%–2% in most studies.⁶⁹ In 2003, the prevalence started growing rapidly and was consistently above 5% in most point-prevalence surveys among IDUs.⁷⁰ Through overlapping risk behaviors,⁷¹ HIV infection appears to have crossed into the sexual networks of men who have sex with men (MSM),⁷² and, to a lesser extent, FSWs.⁷³ Then HIV infection moved to spouses of IDUs, whose contribution to the number of HIV/AIDS cases increased fourfold from 0.5% of all cases in 2001 to 2% of all cases in 2004.⁷⁴ Seventy-six percent of HIV-positive women in the Islamic Republic of Iran acquired the infection from their husbands, who were predominantly IDUs.⁷⁵

More than two decades since the introduction of HIV into MENA populations, the epidemiological landscape continues to be dominated by two patterns. The first is that of exogenous HIV infections related to sexual and injecting drug exposures abroad among the nationals of MENA countries, followed by HIV transmissions to their sexual partners upon their return. The second is that of concentrated or low-intensity HIV epidemics among priority populations.

CONCEPTUAL FRAMEWORK: DYNAMICS OF HIV INFECTIOUS SPREAD IN MENA

There is substantial heterogeneity in HIV spread across MENA and different risk contexts are present throughout the region. However, we can grossly classify the HIV epidemic in MENA, in terms of the extent of HIV spread, into two groups. The first group, which has a considerable HIV prevalence and includes Djibouti, Somalia, and Southern Sudan, is labeled here as **Subregion with Considerable Prevalence**. The second group has a more modest HIV prevalence and includes the rest of MENA countries and is labeled here as the **Core MENA Region**. Because the latter group consists of most MENA countries, HIV epidemiology here represents the main patterns found in MENA.

HIV epidemic typology in the Core MENA Region

Two patterns describe HIV epidemiology in this group of MENA countries. The first is the pattern of exogenous HIV exposures among the nationals of these countries, and HIV transmissions to their sexual partners upon their return. This pattern exists in all MENA countries at some level or another, but also appears to be the dominant pattern in several MENA countries. The weak surveillance systems of priority populations prevent us from definitively concluding whether this is indeed the dominant epidemiologic pattern in these countries. HIV could be spreading among some of the priority groups, or within pockets of these populations, without current awareness of this endemic spread. However, there is no evidence to date that such considerable endemic transmission exists in these MENA countries.

The second pattern in several MENA countries is that of concentrated or low-intensity HIV epidemics among priority populations, particularly IDUs and MSM. Concentrated epidemics are defined as HIV epidemics in subpopulations at higher risk of HIV infection, such as IDUs, MSM, and FSWs; and HIV prevalence is consistently above 5% in at least one priority group, but remains below 1% in pregnant women in the general population.⁷⁶ There is already

⁶⁵ Iran Center for Disease Management, *Country Report on UNGASS*.

⁶⁶ *Ibid.*

⁶⁷ Ministry of Health and Medical Education of Iran, "Treatment and Medical Education"; Iran Center for Disease Management, *Country Report on UNGASS*.

⁶⁸ Afshar, "Health and Prison."

⁶⁹ Ministry of Health and Medical Education of Iran, "Treatment and Medical Education."

⁷⁰ *Ibid.*

⁷¹ Tehrani and Malek-Afzalip, "Knowledge, Attitudes and Practices"; Farhoudi et al., "Human Immunodeficiency Virus"; Razzaghi, Rahimi, and Hosseini, *Rapid Situation Assessment (RSA) of Drug Abuse*; Narenjiha et al., "Rapid Situation Assessment"; Eftekhar et al., "Bio-Behavioural Survey on HIV"; Ministry of Health and Medical Education of Iran, "Treatment and Medical Education"; Mostashari, UNODC, and Darabi, "Summary of the Iranian Situation on HIV Epidemic"; Jahani et al., "Distribution and Risk Factors."

⁷² Eftekhar et al., "Bio-Behavioural Survey on HIV."

⁷³ WHO/EMRO Regional Database on HIV/AIDS; Jahani et al., "Distribution and Risk Factors"; Tassie, "Assignment Report."

⁷⁴ Ministry of Health and Medical Education of Iran, "Treatment and Medical Education."

⁷⁵ Ramezani, Mohraz, and Gachkar, "Epidemiologic Situation"; Burrows, Wodak, and WHO, *Harm Reduction in Iran*.

⁷⁶ Pisani et al., "HIV Surveillance."

documented evidence for concentrated epidemics among priority groups in several MENA countries, such as the HIV epidemics among IDUs in the Islamic Republic of Iran and Pakistan, which are established concentrated epidemics.⁷⁷ There is evidence that suggests that this could also be the case in Afghanistan (in Kabul),⁷⁸ Bahrain,⁷⁹ Libya,⁸⁰ North Sudan,⁸¹ and Oman.⁸²

There is no definitive evidence of the existence of concentrated epidemics among MSM, the most hidden of all risk groups, in any of the MENA countries. However, there is evidence that suggests that this could be the case in Egypt,⁸³ North Sudan,⁸⁴ and Pakistan.⁸⁵ Though the evidence is not strong, there is an indication of an epidemic among MSM in Lebanon; however, it is not yet at the level to be categorized as a concentrated epidemic.⁸⁶

There is no evidence of the existence of concentrated epidemics among FSWs in this group of MENA countries. HIV prevalence among FSWs has been found on occasions to be substantially higher than that of the general population, but not to the level of concentrated HIV epidemics (greater than 5%). Concentrated epidemics may exist, though, among subgroups of FSWs, such as in southern Algeria.⁸⁷

HIV epidemic typology in the Subregion with Considerable Prevalence

Djibouti,⁸⁸ parts of Somalia,⁸⁹ and Southern Sudan⁹⁰ are in a state of generalized HIV epidemic,

defined as an epidemic with an HIV prevalence consistently exceeding 1% among pregnant women.⁹¹ However, it appears that the epidemics in Djibouti and Somalia, and possibly Southern Sudan, are dynamically similar to those in West Africa where most HIV infections are concentrated in priority groups and bridging populations. The high HIV prevalence among FSWs in Djibouti⁹² and Southern Sudan⁹³ suggests that commercial sex networks are playing the central role in these epidemics, just as in West Africa.⁹⁴

There is no evidence of sustainable general population HIV epidemics in this group of MENA countries. The prevailing epidemics are best understood as concentrated epidemics focused around the commercial sex networks in settings where the size of the commercial sex network is large enough to support an epidemic with a prevalence exceeding 1% in the whole population.

Southern Sudan is of particular concern. There are no sufficient data to characterize satisfactorily HIV epidemiology in this part of Sudan. Southern Sudan is the only part of MENA where limited male circumcision coverage is found. It could already be in a state of general population epidemic. With the recent peace treaty, the resettlement of refugees and internally displaced persons (IDPs), demobilization of soldiers, influx of peacekeepers, and mushrooming of commercial centers, there is a concern as to whether there is fertile ground for further HIV expansion in Southern Sudan.⁹⁵

The two key epidemiologic characteristics that distinguish this subregion of MENA from the Core MENA Region are the concentrated epidemics among FSWs, implying higher levels of risk behavior in commercial sex networks, and the sizes of commercial sex networks, which appear to be significantly larger than those in the rest of MENA.

⁷⁷ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Rounds I, II, and III); Ministry of Health and Medical Education of Iran, "Treatment and Medical Education."

⁷⁸ Todd et al., "HIV, Hepatitis C, and Hepatitis B Infections"; Sanders-Buell et al., "A Nascent HIV Type 1 Epidemic."

⁷⁹ Al-Haddad et al., "HIV Antibodies among Intravenous Drug Users."

⁸⁰ UNAIDS, and WHO, *AIDS Epidemic Update 2003*; Groterah, "Drug Abuse and HIV/AIDS."

⁸¹ Bayoumi, *Baseline Survey of Intravenous Drug Users*.

⁸² Aceijas et al., "Global Overview"; Tawilah and Tawil, *Visit to Sultanate of Oman*; Oman MOH, "HIV Risk among Heroin and Injecting Drug Users."

⁸³ Egypt Ministry of Health and Population, and National AIDS Program, *HIV/AIDS Biological and Behavioral Surveillance Survey*.

⁸⁴ Elrashied, "Prevalence."

⁸⁵ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Rounds I, II, and III).

⁸⁶ Mishwar, "An Integrated Bio-Behavioral Surveillance Study" (final report).

⁸⁷ Fares et al., *Rapport sur l'enquête nationale*.

⁸⁸ UNAIDS, "Notes on AIDS in the Middle East and North Africa."

⁸⁹ WHO, *The 2004 First National Second Generation HIV/AIDS/STI Sentinel Surveillance Survey*.

⁹⁰ Ibid.

⁹¹ Pisani et al., "HIV Surveillance."

⁹² Etchepare, "Programme National de Lutte."

⁹³ McCarthy, Khalid, and El Tigani, "HIV-1 Infection in Juba, Southern Sudan."

⁹⁴ Cote et al., "Transactional Sex"; Alary and Lowndes, "The Central Role of Clients."

⁹⁵ NSNAC and UNAIDS, *HIV/AIDS Integrated Report South Sudan*.

Status of the HIV epidemic

Table 11.1 summarizes what is known of the current status of the HIV epidemic in MENA countries from the data collected through this synthesis and the epidemiological context. The limitations

of the surveillance systems in MENA are manifest in this table. There are only a few examples where there are sufficient data to conclusively determine the status of the epidemic in the different risk groups in a given MENA country.

Table 11.1 Status of the HIV Epidemic in MENA Countries

Country	Concentrated epidemic among IDUs	Concentrated epidemic among MSM	Concentrated epidemic among FSWs	Generalized epidemic
Afghanistan	Possibly (in Kabul) Unknown (out of Kabul)	Unknown	Apparently not	Unlikely
Algeria	Possibly	Unknown	Possibly (southern part of Algeria) Apparently not (rest of country)	Unlikely
Bahrain	Possibly	Unknown	Unknown	Unlikely
Djibouti	Unknown	Unknown	Established	Established
Egypt, Arab Rep. of	Apparently not	Possibly	Apparently not	Unlikely
Iran, Islamic Rep. of	Established	Possibly	Apparently not	Unlikely
Iraq	Apparently not	Unknown	Unknown	Unlikely
Jordan	Apparently not	Unknown	Unknown	Unlikely
Kuwait	Unknown	Unknown	Apparently not	Unlikely
Lebanon	Apparently not	Apparently not	Apparently not	Unlikely
Libya	Possibly	Unknown	Unknown	Unlikely
Morocco	Unknown	Unknown	Apparently not	Unlikely
Oman	Possibly	Unknown	Unknown	Unlikely
Pakistan	Established	Possibly	Apparently not	Unlikely
Qatar	Unknown	Unknown	Unknown	Unlikely
Saudi Arabia	Unknown	Unknown	Unknown	Unlikely
Somalia	Unknown	Unknown	Likely	Possibly in some parts
Sudan	Possibly (North Sudan) Unknown (Southern Sudan)	Possibly (North Sudan) Unknown (Southern Sudan)	Apparently not (North Sudan) Likely (Southern Sudan)	Unlikely (North Sudan) Likely (Southern Sudan)
Syrian Arab Republic	Apparently not	Unknown	Apparently not	Unlikely
Tunisia	Apparently not	Unknown	Apparently not	Unlikely
United Arab Emirates	Unknown	Unknown	Unknown	Unlikely
West Bank and Gaza	Unknown	Unknown	Unknown	Unlikely
Yemen, Rep. of	Unknown	Unknown	Apparently not	Unlikely

Source: Authors.

Note: Established: direct empirical data support this conclusion; Likely: evidence suggests strongly the possibility, but no conclusive, direct, empirical evidence to date; Possibly: fragmented evidence suggests the possibility, but no direct empirical evidence; Apparently not: fragmented evidence suggests that this is not the case; Unlikely: evidence suggests that this is a very remote possibility; Unknown: evidence not available.

Essence of HIV dynamics in MENA

The essence of the HIV dynamics in MENA, with regard to the conceptual framework delineated in chapter 1, is illustrated in figure 11.1. The levels of HIV prevalence, risk behaviors, and biomarkers of risk all indicate that the HIV dynamics are focused in the circle containing priority and bridging populations. The groups of potential sustainable HIV transmission for each MENA country include the priority populations of IDUs, MSM, and possibly FSWs in a few countries. Concentrated epidemics among these groups either have occurred or have the potential to occur as described earlier in figure 1.3b. HIV is not sustainable in the general population in any MENA country, except possibly for Southern Sudan.

In addition to this epidemiologic profile, there is an epidemiologic pattern of randomly distributed exogenous HIV exposures among the nationals of MENA countries, and HIV infections among their sexual partners upon their return. This pattern appears to be dominant in a number of MENA countries where considerable HIV epidemics among priority populations have not occurred.

The conceptual framework describes HIV epidemiology in MENA, but there are still heterogeneities in scale and types of priority groups

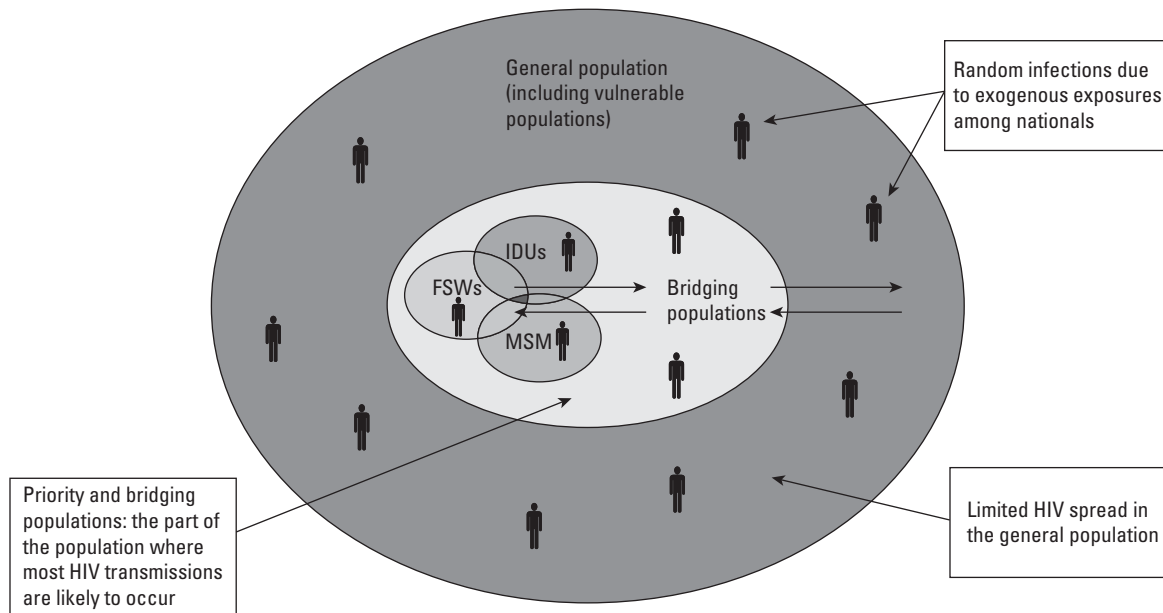
that drive HIV dynamics across the region. In Djibouti, parts of Somalia, and Southern Sudan, there are concentrated epidemics in commercial sex networks that continue to drive HIV transmission in these localities. The levels of sexual risk behaviors in the commercial sex networks are substantial and the sizes of these networks are significant, leading to a considerable HIV prevalence in the population of as much as a few percentage points. In the rest of the MENA countries, there do not appear to be concentrated HIV epidemics in commercial sex networks and the sizes of these networks appear to be considerably smaller.

Similar heterogeneities apply to the rest of the priority groups. While IDU is large in scale in the Islamic Republic of Iran and Pakistan and continues to be the major driver of the HIV epidemics in these countries, it is likely to be relatively smaller in scale and have a minor role in the HIV epidemics in Djibouti, Somalia, and Sudan. The nature and levels of HIV spread among MSM are the least understood in MENA.

GENERAL FEATURES OF HIV SPREAD IN MENA

HIV infection has already reached all corners of MENA and the vast majority of HIV infections

Figure 11.1 Analytical View of HIV Epidemiology in MENA



Source: Authors.

Note: The majority of infections are focused in the circle containing priority and bridging populations.

are coming from within the already existing sexual and injecting drug risk networks. MENA countries have made enormous progress in controlling parenteral HIV transmissions due to contaminated blood and poor safety measures. Nonetheless, the region as a whole is failing to control HIV spread along the contours of risk and vulnerability, despite promising recent efforts, such as in the Islamic Republic of Iran and Morocco. Priority populations, including IDUs, MSM, and FSWs, are documented to exist in every country of MENA. With the volume of evidence collected in this synthesis, there is no more room for denial that risk behaviors do exist and indeed are common in MENA.

Number of HIV infections

It is estimated that Sudan has the largest number of HIV infections, about 320,000 to 350,000, which account for roughly 60% of all HIV infections in the broad definition of the MENA region used in this report (chapter 1).⁹⁶ The majority of infections in this country appear to be concentrated in Southern Sudan, where the limitations in terms of public health are most severe.⁹⁷ HIV prevalence in Southern Sudan is estimated to be up to eight times higher than that in the capital, Khartoum.⁹⁸ For the rest of the MENA countries, the estimated number of HIV infections ranges between a few hundred in the small countries to tens of thousands in the larger countries.⁹⁹ It is important to note that these estimates have wide confidence margins and are based on limited data. Given the evidence collected in this synthesis, there might be room to conduct a more precise quantitative assessment of the number of HIV infections.

Reported numbers of HIV cases remain small and most HIV infections appear to be occurring in men and in urban areas.¹⁰⁰ However, the number of case notifications has been increasing

in recent years.¹⁰¹ The large fraction of AIDS cases among newly discovered HIV infections and the short interval from HIV notification to AIDS diagnosis¹⁰² suggest that HIV diagnosis and testing rates are low, and that a large fraction of HIV infections are being missed. The inertia in diagnosing HIV infections may be preventing a prompt response to ongoing or emerging HIV epidemics.

HIV prevalence

HIV prevalence overall continues to be at low levels compared to other regions. The overarching pattern is that of very limited HIV spread in the general population but growing epidemics in priority populations, including IDUs and MSM and, to a lesser extent, FSWs. Although there is a considerable fraction of HIV infections that are being characterized as unknown,¹⁰³ these infections possibly reflect the under-reporting of risky behavior due to the perceived adverse consequences that might come with admitting to culturally unacceptable behavior. The epidemic has reached the stages of a generalized epidemic, prevalence greater than 1% among pregnant women, in three countries, and the stages of a concentrated epidemic, prevalence greater than 5% in at least one priority group, in several other countries. The levels of reported sexual and injecting drug risk behaviors are substantial among the majority of the priority populations and are comparable to levels reported in other regions. The levels of proxy biomarkers including sexually transmitted infections (STIs) and HCV are also substantial in these groups. These facts confirm the potential for HIV infection to spread among at least some of the priority populations.

HIV is spreading at different rates among priority populations. Consistent with global patterns,¹⁰⁴ IDU epidemics are the fastest in terms of speed of growth. In Pakistan, HIV prevalence was 0.63% at the end of 2003 at a

⁹⁶ UNAIDS, *AIDS Epidemic Update 2007*; SNAP, "Update on the HIV Situation in Sudan," UNAIDS Country Database 2007, <http://www.unaids.org/en/CountryResponses/Countries/default.asp>.

⁹⁷ Del Viso, "UNDP Supports HIV/AIDS/STD Project"; Mandal, Purdin, and McGinn "A Study of Health Facilities."

⁹⁸ SNAP, *HIV/AIDS/STIs Prevalence*.

⁹⁹ UNAIDS, *AIDS Epidemic Update 2007*; UNAIDS Country Database 2007, <http://www.unaids.org/en/CountryResponses/Countries/default.asp>.

¹⁰⁰ WHO/EMRO Regional Database on HIV/AIDS.

¹⁰¹ WHO/EMRO Regional Database on HIV/AIDS; Madani et al., "Epidemiology of the Human Immunodeficiency Virus."

¹⁰² WHO/EMRO Regional Database on HIV/AIDS; Chemtob and Srour, "Epidemiology of HIV Infection among Israeli Arabs."

¹⁰³ UNAIDS and WHO, *AIDS Epidemic Update 2006*.

¹⁰⁴ Piyasirisilp et al., "A Recent Outbreak"; Nguyen et al., "Genetic Analysis."

site in Karachi,¹⁰⁵ but the prevalence increased to 23% at this site by mid-2004.¹⁰⁶ This pattern has been witnessed in a few other MENA countries. However, it is also possible for HIV epidemics among MSM to grow rapidly as well. There are multiple indications that the epidemic among MSM is growing in the region. In a number of MENA countries, HIV prevalence among MSM could already be at considerable levels despite limited HIV prevalence among IDUs. MSM, however, are the most hidden and the hardest-to-reach priority group through surveillance and interventions.

Apart from the notable exceptions of Djibouti, Somalia, and Southern Sudan, HIV prevalence is at relatively low levels among commercial sex networks. The prevalence among FSWs appears to grow slowly in MENA and may not reach the high levels it reached in other regions. Given the prominent role of commercial sex networks in the epidemics of Djibouti, Somalia, and Sudan, interventions with FSWs and their clients might be the best method to control HIV spread in this part of MENA.¹⁰⁷

No general population HIV epidemic in MENA

There is no evidence of an HIV epidemic in the general population in any of the MENA countries. Available HIV prevalence and behavioral data suggest that HIV infectious spread is not self-sustainable in the general population of MENA countries, except possibly for Southern Sudan. Low levels of STI prevalence including human papillomavirus (HPV) and herpes simplex virus 2 (HSV-2) in the general population support this inference. The fact that HIV is more likely to be sustainable and focused in priority populations does not imply that the general population is immune against HIV spread. HIV will find its way into the general population through transmission chains originating at the high-risk cores, although these chains are not self-sustainable and will eventually die out.

¹⁰⁵ Altaf et al., "Harm Reduction among Injection Drug Users."

¹⁰⁶ Bokhari et al., "HIV Risk in Karachi and Lahore, Pakistan."

¹⁰⁷ Boily, Lowndes, and Alary, "The Impact of HIV Epidemic Phases"; Lowndes et al., "Interventions among Male Clients."

Protective factors

Several protective factors have slowed and limited HIV transmissions in MENA relative to other regions. Male circumcision is almost universally practiced in MENA and is associated with a 60% efficacy against HIV infection for men.¹⁰⁸ Male circumcision can also substantially slow the expansion of HIV in a population, thereby providing a window of opportunity to intervene against an epidemic before it reaches higher levels.¹⁰⁹

The cultural traditions in MENA are influenced by Islamic teachings. Islam promotes a line of behavior that is consonant with several themes of HIV/AIDS prevention including prohibitions against premarital and extramarital sex¹¹⁰; prohibitions against alcohol consumption because of alcohol's strong association with higher risk behavior, paying for sex, and misuse of protective measures such as condoms¹¹¹; closed sexual networks of monogamous or polygamous marriages¹¹²; prohibition against intercourse during menstruation¹¹³; and possibly ritual washing and penile and vaginal hygiene following intercourse.¹¹⁴ Being a Muslim has been repeatedly associated with lower risk behavior,¹¹⁵ and lower HIV prevalence,¹¹⁶ in Muslim-majority countries as well as in Muslim minorities in predominantly non-Muslim nations.¹¹⁷ Islamic religiosity was found in one study not to be associated with lower use of condoms for

¹⁰⁸ Auvert et al., "Randomized, Controlled Intervention Trial"; Bailey et al., "Male Circumcision"; Gray et al., "Male Circumcision."

¹⁰⁹ Alsallaq et al., "Quantitative Assessment."

¹¹⁰ Pickthall, *The Meaning of the Glorious Qur'an*.

¹¹¹ Mbulaiteye et al., "Alcohol and HIV"; Kaljee et al., "Alcohol Use and HIV Risk Behaviors"; Fisher, Bang, and Kapiga, "The Association between HIV Infection and Alcohol Use."

¹¹² Huff, "Male Circumcision: Cutting the Risk?"

¹¹³ Elharti et al., "Some Characteristics."

¹¹⁴ Lerman and Liao, "Neonatal Circumcision."

¹¹⁵ Bailey, Neema, and Othieno, "Sexual Behaviors"; Shirazi and Morowatisharifabad, "Religiosity and Determinants of Safe Sex"; Rakwar et al., "Cofactors for the Acquisition of HIV-1"; Isiugo-Abanihe, "Extramarital Relations"; Biaya, "Les plaisirs de la ville"; Gilbert, "The Influence of Islam on AIDS."

¹¹⁶ Gray, "HIV and Islam"; Mbulaiteye et al., "Alcohol and HIV"; Rakwar et al., "Cofactors for the Acquisition of HIV-1"; Kengeya-Kayondo et al., "Incidence of HIV-1 Infection in Adults"; Malamba et al., "Risk Factors for HIV-1 Infection in Adults"; Gray et al., "Male Circumcision and HIV"; Bwayo et al., "Human Immunodeficiency Virus Infection"; Nunn et al., "Risk Factors for HIV-1 Infection"; Abebe et al., "HIV Prevalence"; Drain et al., "Correlates of National HIV Seroprevalence"; Meda et al., "Low and Stable HIV Infection Rates."

¹¹⁷ Gray, "HIV and Islam"; Kagee et al., "HIV Prevalence."

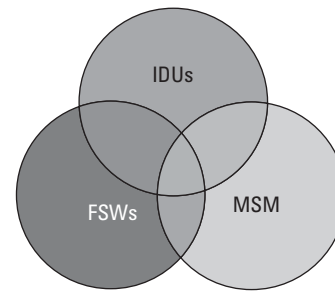
those who are sexually active.¹¹⁸ Islamic cultural traditions have been cited as a protective factor even after adjustment for male circumcision.¹¹⁹

While Islamic values provide protection against HIV/AIDS,¹²⁰ several studies suggest that adherence to Islamic codes of conduct is not perfect and that Muslims do engage in sexual and injecting drug activities not sanctioned in Islam.¹²¹ What is promoted religiously is not necessarily what is put into practice.¹²² Though the social fabric of MENA societies is heavily influenced by Islamic traditions, the region is also experiencing a sociocultural transition that is leading to more tolerance and acceptance of behaviors such as premarital sex and extramarital sex.¹²³ The evidence for recent increases in risky behavior points to this direction (see youth section in chapter 9). Counting only on the “cultural immunity” of religious and traditional mores¹²⁴ is not enough to prevent the worst of the HIV epidemic.

Overlap of risky behaviors

A hallmark of risky behavior in MENA is the intersection of priority groups, with abundant evidence of overlapping risk factors.¹²⁵ The social, sexual, and injecting drug networks of priority groups overlap and intersect, allowing HIV to easily propagate between different priority populations (figure 11.2). HIV is spreading from one priority group to another. In the Islamic Republic of Iran and Pakistan, the epidemic among MSM appears to have been sparked by ample overlap with injecting drug practices.¹²⁶ If HIV establishes itself in one priority population, it can easily find ways to spread through the overlapping risks to other priority populations.

Figure 11.2 A Schematic Diagram of the Overlap between Priority Populations in MENA



Source: Authors.

Risk network structures are not well understood

Network structures among priority populations, and even the general population, appear to be complex and intricate and are not yet well understood. Some of the injecting drug and sexual networks appear to be sparse, consisting of many subcomponents that are loosely connected to each other. Each of these components is small and tightly knit, such as possibly among IDUs in Lebanon.¹²⁷ Figure 10.3a illustrates this kind of network. Networks of this nature are not conducive to substantial HIV spread because the infection finds many obstacles in propagating from one subcomponent to another. It is not yet determined whether the sparse nature of some network structures has contributed to the limited HIV prevalence in MENA.

Vulnerability of spouses and other regular sexual partners

Ample evidence documents men acquiring the infection through high-risk practices including IDU and sexual contacts with FSWs or other males, and then passing the infection to their wives. Matrimony, rather than sexual or injecting risk behavior, is the leading risk factor for HIV infection among women in MENA. Sexual partners of priority populations form a key group at risk of exposure to HIV, but they appear to rarely engage in risky behavior or pass the infection further. Ninety-seven percent of HIV-positive women in Saudi Arabia, who

¹¹⁸ Gilbert, “The Influence of Islam.”

¹¹⁹ Hargrove, “Migration, Mines and Mores.”

¹²⁰ Ridanovic, “AIDS and Islam.”

¹²¹ Gilbert, “The Influence of Islam”; Gibney et al., “Behavioural Risk Factors”; Kagimu et al., “Evaluation of the Effectiveness.”

¹²² Ridanovic, “AIDS and Islam.”

¹²³ Busulwa, “HIV/AIDS Situation Analysis Study.”

¹²⁴ Khawaja et al., “HIV/AIDS and Its Risk Factors in Pakistan.”

¹²⁵ UNAIDS, “Fact Sheet on Drug Use.”

¹²⁶ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Rounds I, II, and III); Eftekhari et al., “Bio-Behavioural Survey on HIV.”

¹²⁷ Mishwar, “An Integrated Bio-Behavioral Surveillance Study” (midterm and final report).

acquired the infection sexually, acquired the infection from their husbands.¹²⁸ Seventy-six percent of HIV-positive women in the Islamic Republic of Iran acquired the infection from their husbands, who were predominantly IDUs.¹²⁹ HIV infections are repeatedly found among pregnant women with no identifiable risk behaviors, suggesting that the risk factor is heterosexual sex with the spouse.¹³⁰ Prevention efforts in the region need to address this vulnerability.

Settings of vulnerability

A large fraction of the MENA population belongs to one or another of several vulnerable groups including prisoners, youth, and mobile populations. The socioeconomic context that is leading to risky behavior includes poverty, unemployment, social disruption, gender roles and expectations, sexual exploitation, and inadequate social and health resources.¹³¹ Socioeconomic disparities, large-scale population mobility, and political instability are contributing to increased vulnerability. Complex emergencies are prevalent in the region, such as in Afghanistan, Iraq, Lebanon, Somalia, Sudan, and the West Bank and Gaza.¹³² Marginalization of priority groups is contributing to the vulnerability of these groups to HIV infection.¹³³

HIV knowledge, attitudes, and practices

Though basic knowledge of HIV/AIDS is high in MENA, low levels of comprehensive knowledge of HIV/AIDS, and high levels of misconceptions, stigma, and discrimination, continue to plague MENA populations. Use of protective measures such as condoms is limited and condoms are not always widely or easily accessible. Most MENA populations perceive themselves not at risk of HIV infection even when they practice high-risk behaviors. There is a perception that minimizing apparent risk behaviors is the best protection against HIV, but at a cost of ignoring

safe sex practices. The majority of at-risk heterosexual and homosexual sex acts in MENA are unprotected against HIV. The concept that every sex act with any partner can carry some risk of HIV infection still eludes the majority of the population. The fact that a large fraction of HIV infections are being transmitted within socially acceptable partnerships, such as from a husband to his wife, is still beyond public comprehension.

FUTURE HIV EXPANSION IN MENA

The levels of risky behavior and biomarkers of risk among many priority populations are high and are conducive to substantial HIV epidemics. The fact that HIV prevalence continues to be at zero or low prevalence levels in many priority populations should not be mistaken for a lack of HIV epidemic potential. HIV may simply not yet have had the opportunity to be introduced into some of these groups. Some of the priority groups in MENA tend to be quite isolated, limiting the probability of virus introduction.

Even when the virus is introduced into a priority population at higher risk of HIV, it may take many years before HIV starts to appreciably expand. Figure 11.3 displays a simulated epidemic among an MSM community of 1,000 persons. Though the virus was introduced into the population in the year 2000, it did not start appreciable growth until a decade later. The low HIV transmission probability per coital act,¹³⁴ long duration of latent infection, and slow disease progression¹³⁵ limit the expansion of HIV spread initially, but once HIV prevalence becomes appreciable, HIV incidence and therefore prevalence can increase rapidly.

Indeed, this pattern of emerging epidemics in priority populations appears to be occurring at the moment in at least a few MENA countries. The best recent example to this end is Pakistan, where exogenous exposures dominated the epidemiological profile for two decades, but then rapidly rising epidemics emerged among IDUs and, to some extent, among MSM.¹³⁶

¹²⁸ Alrajhi, Halim, and Al-Abdely, "Mode of Transmission of HIV-1."

¹²⁹ Ramezani, Mohraz, and Gachkar, "Epidemiologic Situation"; Burrows, Wodak, and WHO, *Harm Reduction in Iran*.

¹³⁰ Aidaoui, Bouzbid, and Laouar, "Seroprevalence of HIV Infection."

¹³¹ World Bank, "Mapping and Situation Assessment."

¹³² Salama and Dondero, "HIV Surveillance in Complex Emergencies."

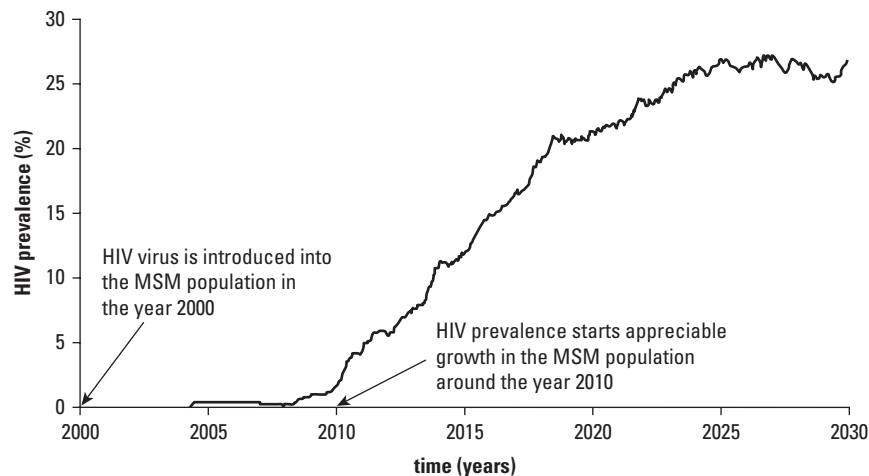
¹³³ Touiri et al., "Study of Psychosocial Factors."

¹³⁴ Wawer et al., "Rates of HIV-1 Transmission per Coital Act."

¹³⁵ Mellors et al., "Prognosis in HIV-1 Infection."

¹³⁶ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance (Rounds I, II, and III)*.

Figure 11.3 Simulation of a Typical HIV Epidemic among an MSM Population



Source: Abu-Raddad 2009.

Note: Simulation produced using a stochastic compartmental model.

HIV prevalence among some IDU groups continues to be at low levels despite reported high-risk behaviors and high HCV prevalence. Therefore, it is likely that we will see further HIV spread and possibly explosive epidemics among IDUs in at least a few MENA countries. HIV epidemic expansion among MSM is a real possibility over the next few years in MENA considering the high levels of risky behavior. Although it does not appear that there is substantial HIV epidemic potential among FSWs in most MENA countries, commercial sex networks are much larger than IDU and MSM networks,¹³⁷ and there could be a considerable rise in the number of HIV infections if HIV establishes itself in some commercial sex networks or in subgroups of FSWs, such as those who inject drugs.

It is unlikely that MENA will experience a sustainable or a substantial HIV epidemic in the general population in the next decade, if ever. However, the region could be poised to see a rise in the number women in the general population who are infected with HIV largely due to the wave of HIV transmissions moving from priority populations and bridging populations to spouses of partners involved in these networks. Considering the relatively high probability of vertical and breastfeeding HIV transmission

from a mother to her child in the absence of HIV treatment,¹³⁸ the region may also be destined to see a rise in easily preventable HIV infections among children, as the HIV disease burden moves further to women.

Though the prevalence of drug injection is in the intermediate to high range at 0.2%,¹³⁹ it seems not as likely that drug injection alone will be the major driver of a substantial HIV epidemic at the level of the whole population in any MENA country. The prevalence of male same-sex practices, at a few percentage points, is consistent with global levels.¹⁴⁰ Therefore, it also seems unlikely that male same-sex contacts alone, within MSM networks as well as beyond these networks, will be the major driver of a large epidemic at the whole population level in a manner that is distinct from other regions.

Prevalence of sex work among women and the fraction of men who visit sex workers appear to be on the lower side of the global range.¹⁴¹ Furthermore, the near universal coverage of male circumcision and the apparently lower risk behaviors in commercial sex networks

¹³⁷ Blanchard, Khan, and Bokhari, "Variations in the Population."

¹³⁸ Coutsoudis et al., "Late Postnatal Transmission"; Connor et al., "Reduction of Maternal-Infant Transmission."

¹³⁹ Aceijas et al., "Global Overview"; Aceijas et al., "Estimates of Injecting Drug Users."

¹⁴⁰ McFarland and Caceres, "HIV Surveillance"; W. McFarland, personal communication; UNAIDS, Epidemiological Software and Tools.

¹⁴¹ Vandepitte et al., "Estimates of the Number of Female Sex Workers."

may prevent concentrated HIV epidemics among FSWs from materializing for at least a decade, if ever (apart from Djibouti, Somalia, and Sudan). Hence, it seems also unlikely that commercial sex networks alone will be the major driver of a large epidemic at the whole population level, except again for Djibouti, Somalia, and Sudan.

Considering all of the above, it is unlikely that the HIV epidemic in MENA will take a course similar to that in sub-Saharan Africa if the existing social and epidemiological context in the region remains largely the same. At most, the region may face up to few percentage points prevalence in several of its countries. This would still imply an immense disease burden and subsequent economic burden in a region that is mostly unprepared for such an epidemic.

A key unknown in the understanding of the epidemiology of HIV in MENA is that of the levels of recent increases, and future trends, in risky behavior. If the increases in risky behavior are substantial, this could put some aspects of this analytical view of the dynamics in question. The trajectory of the HIV epidemic may be different and we may observe somewhat considerable HIV epidemics in some MENA populations. Studying the levels of risky behavior and STI incidence among youth, such as using multicenter cohort studies, should be considered by scientific researchers in MENA.

The analytical insights drawn here from a synthesis of thousands of studies and data sources indicate that there is no escape from the necessity of developing robust surveillance systems to monitor HIV spread among priority populations. Effective and repeated surveillance of priority populations, particularly among IDUs and MSM, is key in MENA countries to definitively conclude whether HIV spread is indeed limited in priority populations, and to detect emerging epidemics among these groups at an early stage. This would offer a window of opportunity for targeted prevention at an early phase of an epidemic. Monitoring recent infections and examining the nature of exposures could also be useful in detecting emerging epidemic chains of transmission within MENA populations.

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Snapshot on Response to HIV Epidemic in MENA: Linking Evidence with Policy and Programmatic Action to Avert the Epidemic

The epidemiological assessment detailed in the previous chapters highlights that the human immunodeficiency virus (HIV) disease burden in the Middle East and North Africa (MENA) is concentrated in priority populations, including injecting drug users (IDUs), men who have sex with men (MSM), and commercial sex networks, as well as the partners of these populations. There is very limited HIV spread in the general population. While HIV is likely to expand its spread in priority populations over the next decade, it is unlikely that MENA will experience substantial HIV epidemics in the general population such as those found in sub-Saharan Africa.

For any HIV response to be successful and cost-effective, it must be tailored to the epidemiological reality of HIV transmission patterns. The analytical synthesis in this report provides the strategic evidence necessary for determining the effectiveness of the HIV response in MENA, and the appropriateness of current resource allocation to control HIV spread.

This chapter provides a snapshot of HIV efforts in the region from the perspective of assessing the extent to which the response is in alignment with HIV epidemiology. This chapter is not an attempt to provide a comprehensive or exhaustive review of HIV efforts in MENA. A detailed analysis of response and resource allocation is beyond the scope of this report. HIV efforts are highly heterogeneous and cover a

wide spectrum of interventions across MENA. This chapter discusses mainly the HIV response through the lens of the epidemiological findings of this research work.

HIV PREVENTION IN MENA

Scaling up HIV prevention for people most at risk is the key to averting further spread of the HIV epidemic in MENA. As documented in the previous chapters, the relatively limited magnitude and current potential for HIV transmission across the region continue to provide a window of opportunity for containing the epidemic.¹ Timing, however, is critical, and effective HIV prevention should be pursued with great vigor and unyielding intensity.

While HIV prevention remains limited in scope and scale in MENA, based on a review of national strategic plans (NSPs), a few countries have made some advances, such as prevention efforts designed to engage female sex workers (FSWs), MSM, and IDUs in Morocco, and IDUs in the Islamic Republic of Iran. Prevention efforts in the region are impeded by generic and routine planning, competing priorities, limited human capital, and lack of monitoring and evaluation,

¹ Jenkins and Robalino, "HIV in the Middle East and North Africa"; World Bank, "Preventing HIV/AIDS in the Middle East and North Africa."

while national policies remain inadequate and do not sufficiently reflect evidence-informed approaches. Although there are noteworthy and recent examples, still very few prevention programs in MENA have adopted a comprehensive approach encompassing policy dimensions, strategic information, and an optimal mix of interventions developed with and implemented by members of the concerned populations.

FOCUSED HIV PREVENTION PROGRAMS FOR PEOPLE EXPOSED TO RISK

Priority populations in MENA are either disproportionately affected or more vulnerable to contracting HIV compared to other populations. As in all low prevalence and concentrated epidemic settings in the world, it is expected that MENA countries strategically focus their response on key populations at risk, namely, IDUs, MSM, and FSWs. However, a review of national strategic plans revealed that only those of Lebanon, Morocco, and Pakistan aim to engage each of the three priority populations.² Other countries have either included strategies for one or two key populations only, or mentioned a lump of key populations at risk without including specific strategies to address their specific needs and risks.

It is worth noting that countries that have clearly stated objectives or strategies addressing priority populations have been more successful in directing their response to effective interventions. Morocco, for example, is the only country in the region that was able to implement and rapidly scale up comprehensive services for MSM and FSWs, in spite of the cultural sensitivity. Similarly, the Islamic Republic of Iran and Pakistan have introduced harm reduction services for IDUs (but these need to be at a larger scale), and Djibouti could introduce targeted interventions for FSWs. Promising programs are currently developing in Afghanistan for IDUs and in Lebanon and Tunisia for the three key populations at risk.

The role of civil society and nongovernmental organizations (NGOs) in implementing activities addressing priority populations has been pivotal.

It can be noted that where NGOs are strong, the response is strong (for example, Algeria, the Islamic Republic of Iran, Lebanon, Morocco, and Pakistan).

While there is wider recognition in MENA countries of the importance of implementing targeted interventions for priority populations, there is concern over the coverage and the quality of those services and whether the services have the potential to avert the epidemic. Program monitoring data are scarce and thus cannot confirm the appropriateness of the response in terms of service coverage or specific services.

Injecting drug users

With the emergence of IDU as an important driver of the epidemic in MENA, and with the wealth of evidence accumulated around the world regarding the effectiveness of harm reduction interventions in preventing, slowing, or even reversing HIV epidemics among IDUs,³ harm reduction is increasingly appropriate in MENA.

MENA countries, however, are at different stages of introducing the different components of the harm reduction package. The Islamic Republic of Iran is a model country in its response to HIV among IDUs, with a rapidly scaled-up plan to make available needles and syringes, opioid substitution therapy (OST), HIV testing and counseling, and sexually transmitted infection (STI) services. Once stabilized on OST, eligible HIV-positive IDUs are provided with antiretroviral therapy (ART).

After conducting an assessment of risk behaviors among IDUs, Morocco developed its harm reduction policies and integrated them into its national AIDS strategic plan. Currently, pilot drop-in centers performing needle and syringe exchange are in place, while preparations for introducing OST are underway.⁴ Similarly, the Lebanese Minister of Health has publicly announced his commitment to introducing OST into the public health system as a national response, after a successful buprenorphine substitution program was introduced by the NGO

² UNAIDS and ASAP, "Review of National AIDS Strategic Plan."

³ Des Jarlais et al., "HIV Incidence"; Metzger et al., Human Immunodeficiency Virus Seroconversion"; van Ameijden et al., "Interventions among Injecting Drug Users."

⁴ G. Riedner, personal communication (2008), and site visits to drop-in centers in Tangier and Tetouane.

Skoun.⁵ Lebanon's National AIDS Program is currently putting in place measures to expand OST. Needle and syringe programs are also being implemented by NGOs through outreach workers. Over the last few years Pakistan has scaled up its outreach, needle and syringe exchange, testing, and counseling services for IDUs.⁶ Multisectoral national consultation is currently being held to initiate OST. Afghanistan has initiated drop-in centers providing harm reduction services, except for OST, which is expected to start in the near future.⁷ A few NGOs in the Arab Republic of Egypt are providing sterile needles and syringes to IDUs through outreach.⁸ Oman is reviewing its national policies and regulations to assess the need for and feasibility of OST.⁹

A regional civil society movement has formed and is called the Middle East and North Africa Harm Reduction Association (MENAHRRA).¹⁰ MENAHRRA's objective is to build the capacity of civil society organizations for harm reduction through training, sharing information, networking, and providing direct support to NGOs to initiate or scale up harm reduction services. MENAHRRA includes three subregional knowledge hubs: Lebanon's hub is hosted by an NGO (SIDC [*Soins Infirmiers et Développement Communautaire*]), the Islamic Republic of Iran's hub is hosted by the Iranian National Center for Addiction Studies (INCAS), and Morocco's hub is hosted by the Ar-Razi psychiatric hospital. The MENAHRRA network connects over 350 professionals in the field of drug use and HIV through its Web site, bimonthly newsletter, and ad hoc announcements.

Men who have sex with men

Data on MSM have been the most difficult to obtain, but have begun to emerge over the last five years and are indicating the need for immediate action. Limited adoption of safe sexual practices and low access to services are

heightened by marginalizing sociocultural attitudes, as a study of MSM suggests in Lebanon.¹¹ The majority of MSM in the study indicated that they face exclusion from their communities and families.¹² As far as their own practices are concerned, they often engage in unprotected sex, with 74% of those surveyed identifying unprotected sex as the main reason for seeking voluntary counseling and testing (VCT).

In a study in Sudan, more than half (55.6%) of MSM study participants had exchanged sex for money.¹³ Close to half of those who had commercial sexual partners did not use a condom in the last sexual contact, and 85.3% indicated nonavailability of condoms at the time of the sexual act as the reason for lack of use. High-risk practices coupled with a significant HIV prevalence rate (9.3%) for this group emphasize the need for immediate prevention services for MSM.

In Tunisia, the qualitative and quantitative survey conducted among MSM documented substantive risk behaviors, limited access to services, and that more than 92.2% of those surveyed had both male and female partners.¹⁴

Customary claims that stringent legal and social context deters implementation of prevention programs should not be a reason to shy away from adapting programs and denying services to MSM. A number of countries are now addressing this population directly, although this remains particularly sensitive with the general public, community leaders, and law enforcement agencies. Examples include Lebanon, where NGOs such as Helem and SIDC, along with the National AIDS Program, have implemented outreach and HIV prevention for MSM. In Algeria, the first outreach HIV prevention program for people most at risk has reached out to male sex workers (MSWs) with services and condoms. In Tunisia and Morocco, MSM are the outreach workers informing their peers on HIV prevention services, accompanying them to VCT, and providing condoms and lubricants (when available). The assessment undertaken in Sudan on better understanding the needs of MSM and their vulnerabilities is

⁵ Skoun, "New Perspectives."

⁶ Punjab Provincial AIDS Control Programme, "The Lethal Overdose"; Nai Zindagi quarterly reports 2007 (www.naizindagi.com/Reports).

⁷ WHO/EMRO, unpublished country information.

⁸ Aziz et al., "The Impact of Harm Reduction."

⁹ WHO/EMRO, unpublished country information.

¹⁰ MENAHRRA, <http://www.menahra.org/>.

¹¹ Dewachi, "HIV/AIDS Prevention."

¹² Ibid.

¹³ Elrashied, "Prevalence, Knowledge and Related Risky Sexual Behaviours."

¹⁴ Hsairi and Ben Abdallah, "Analyse de la situation de vulnérabilité."

a stepping stone to establishing trust with the communities and tailoring HIV prevention programs to their needs. In Pakistan, a special program is set for MSM, MSWs, and *hijras*.¹⁵ Through NGOs, outreach peer education and condom distribution are expected to reach over 56,000 members of these priority groups by 2013.

Commercial sex

As demonstrated in the previous chapters, men and women involved in sex work face an increased risk of HIV infection. In addition to the illegal status of FSWs in the majority of MENA countries, social taboos and lack of means to protect FSWs from exploitation cause clandestine prostitution to thrive in all countries, as well as in Tunisia, where sex work is regulated by law. Consequently, those involved are secluded and often reluctant to seek health, social, or legal services or to disclose their risk of HIV exposure.¹⁶

This is compounded by social exclusion and the negative attitudes of communities and service providers, attitudes mainly due to sociocultural conservative attitudes on sexual behavior.

Despite overall reluctance and the stringent context, HIV prevention programs started in Morocco in the 1990s and have provided male and female sex workers with prevention information and prevention, condoms, testing, counseling, and STI services. In Lebanon, one NGO, Dar el Amal (the *House of Hope*), which has provided health, social, and vocational services for female FSWs since the 1970s, has mainstreamed HIV services into its activities. The first outreach peer-educator FSWs were recruited from this NGO.

Similarly, an NGO in Tunisia (ATL MST/sida-section de Tunis [Association Tunisienne de Lutte contre les MST et le sida-Section de Tunis]), through outreach work implemented by FSWs and MSM, provides HIV information and prevention kits (including condoms and lubricants) and conducts awareness-raising services and referral for VCT or treatment services. A qualitative survey of FSWs¹⁷ in Algeria resulted

in programs for those people most at risk. Subsequently, in 2008, AIDS Algeria provided more than 1,500 males and females involved in sex work in Oran and Alger with condoms and HIV prevention information and materials.

The first project for women in vulnerable situations, established in Cairo in 2006 and implemented through Shehab NGOs, resulted in awareness-raising services mainly for FSWs, reaching more than 900 FSWs in the first two years of implementation.¹⁸ The project, through outreach work and a drop-in center, established trust with the concerned communities; ensured access to STI treatment, legal services, and training on negotiation skills and condom use; and generated crucial information on the structural vulnerabilities of those involved in sex work.

In the Islamic Republic of Iran, a promising experience is currently unfolding. It includes the provision of services to FSWs through the establishment of drop-in centers for women in risky situations. Interventions include HIV testing and counseling, harm reduction services for women using drugs, condom distribution, and STI services. This is believed to be an adapted approach to engaging FSWs given sociocultural sensitivity and their illegal status.

Starting in 2003, in Djibouti, programs designed to engage FSWs were implemented; they included awareness raising, STI services, HIV testing and counseling, and condom promotion and distribution. Other countries such as Afghanistan, Jordan, Pakistan, and Sudan are reportedly conducting awareness raising for FSWs through outreach. The results generated and trust built with the communities in some of these examples have led to expansion of the programs through NGOs and community organizations. It has also led to initiating partnerships with police and community leaders to facilitate implementation of programs and to protect the well-being of concerned communities. Support mobilized from the Joint United Nations Programme on HIV/AIDS (UNAIDS), the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM), HIV International Alliance, and others has been instrumental in expanding efforts in several countries.

¹⁵ Pakistan National AIDS Control Program, *HIV Second Generation Surveillance* (Rounds II and III).

¹⁶ Karouaoui, "Report of Mission on HIV and Sex Work in Oman."

¹⁷ AIDS Algérie, UNAIDS, and UNFPA, *Travail du Sexe et VIH/SIDA en Algérie*.

¹⁸ ONUSIDA, *Rapport de fin de Mission Appui aux Programmes de Prévention SIDA*.

Young people

Peer influence can encourage risky behavior, but it can also be used to spread knowledge through peer educators.¹⁹ The Islamic Republic of Iran has spearheaded a peer education program in schools that has trained thousands of students to educate peers on HIV.²⁰ A special course on AIDS was developed as an appendix to biology books and 13,000 teachers and school physicians have been trained to educate 1.5 million students in high schools.²¹ Tunisia had a program to reach out to youth through appropriate education, counseling and testing, condoms, and STI services that reached 10% of the youth.²² In Sudan, an intervention for youth has provided over 300,000 young people with health education sessions covering various topics.²³

Progress in HIV prevention

Progress made over the last four years in terms of generating crucial information on HIV prevalence, risks, and vulnerabilities for priority populations and settings has been a breakthrough in informing advocacy efforts and programmatic choices, contributing to policy change, and creating an enabling environment.

With just a few exceptions, HIV prevention programs have recently taken a qualitative step forward by combining several communication and service-delivery approaches and focusing on behavior change in the form of risk and harm reduction. Enhancing the quality of interventions, expanding coverage, and intensifying implementation remain key challenges for HIV prevention programs that engage high-risk populations in the region.

One of the main obstacles that prevention efforts had to overcome was the limited knowledge on, contacts with, and participation of the concerned populations. To overcome these obstacles, peer education and outreach strategies were introduced and are now essential

components in evolving HIV prevention efforts, encouraging and facilitating the engagement of civil society and national AIDS programs with the concerned populations and communities.

HIV prevention efforts raise awareness and provide information, materials, and services (for example, condoms; interpersonal communication; referrals to VCT; and STI, ART, and other health care and social support programs) including risk or harm reduction. Prevention efforts focus on changing risky or maintaining safe behaviors through channels such as interpersonal communication, peer education, and outreach.

ACCESS TO MEANS OF PREVENTION

While this shift over time from HIV prevention based mainly on health promotion to a more focused approach on behavior change is notable, the coverage and quality of services and means of prevention in the region are still far from adequate. Access to HIV-related prevention means and services remains sporadic, with very limited coverage, and is therefore unlikely to lead to significant behavior change.

With regard to condom availability, some progress has been made with some countries (such as in Algeria, Jordan, Morocco, and Sudan) reporting an increase in condom availability and distribution, mainly as part of indicators to monitor progress of GFATM-supported projects. These data are an important leap toward making means of prevention available; however, little is known about whether condom distribution is part of a behavior change approach reaching people most at risk. However, stigma related to the very nature of HIV transmission, compounded by the social marginalization of those exposed, hampers efforts to include condoms and other means of prevention as part of prevention programs in many countries. It is also noted that in specific programs for people most at risk, the messages delivered and means of prevention have not been adapted to their needs; therefore, they have little impact on behaviors, especially while negotiation skills with their sexual partners are limited.

Information, education, and communication (IEC) materials for refugees and mobile

¹⁹ Busulwa, "HIV/AIDS Situation Analysis Study"; Kocken et al., "Effects of Peer-Led AIDS Education."

²⁰ Gheiratmand et al., "A Country Study."

²¹ Gheiratmand et al., "A Country Study"; Mohebbi and Navipour, "Preventive Education."

²² Jenkins and Robalino, "HIV in the Middle East and North Africa."

²³ SNAP and UNAIDS, "HIV/AIDS Integrated Report North Sudan, 2004-5."

populations in the Republic of Yemen, for example, were not adapted to the languages of those concerned, nor were the messages explicit in terms of transmission modes and prevention methods. Condoms were not included as part of prevention activities, and referrals to VCT were lacking. The situation is compounded by the limited capacities and resources of implementing partners to provide prevention materials, such as condoms and lubricants, and make them accessible as part of outreach activities.²⁴

In a review of programs for IDUs in Egypt, provision of needles, syringes, condoms, and other HIV prevention commodities appeared to be inconsistent at the three sites reviewed.²⁵ The outreach program for MSM in Tunisia is in desperate need of a robust and sustainable procurement system for water-based lubricants for distribution with the prevention kit.

The use of condoms in HIV prevention protective strategies is reported to be generally low in the region (chapter 8). Condom use is also low and irregular among people who need them the most, including those reporting multiple and casual unprotected sexual contacts, although utilization rates among such groups are still considerably higher than in the general population (chapter 8). Despite the above evidence, condom promotion, access, and distribution are still conspicuously missing from many HIV prevention programs being implemented in the region. Even when programs have included condoms, access has remained difficult and limited to certain distribution points.

Continuing to ignore the sensitive but essential issue of condom accessibility and neglecting the promotion of its protective role for everyone, particularly for people most at risk, are undoubtedly crippling effective HIV prevention efforts, as is the case in many countries of the region.

HIV TESTING AND COUNSELING

Initially, most VCT centers across the region were located only in the capital cities as part of governmental health facilities, discouraging those fearing stigma from checking their HIV status. There was substantial delay in the

establishment of VCT services at a community level across the region.

Morocco is one of the first countries to establish VCT centers with broad, national coverage. Today, Algeria has expanded its VCT network across the country and more than 75 centers have been established in Sudan. In Lebanon, the innovative model of establishing and managing VCTs through NGOs was adopted by the National AIDS Program and partners.²⁶

However, the recent increase in VCT services has not translated into enhanced prevention efforts or an increased number of those who know their HIV status. A recent review revealed that VCT services are either not available or limited to major cities in most countries.²⁷ Where they exist, these VCT services are underused. Different reasons may account for this, including the absence or low coverage of HIV prevention programs among priority groups and vulnerable and other populations, as well as weak message quality and lack of referrals to the VCT. Other factors could be the general concern that confidentiality may not be maintained and the negative attitudes of service providers in the VCT centers, which have been documented in some countries.

The same review has demonstrated that HIV rapid tests have not been fully adopted in MENA. Where they are used, laboratory confirmation of reactive tests requires the use of ELISA (enzyme-linked immunosorbent assay), and, in many cases, Western blot assay. The resulting waiting time and cumbersome procedure for the clients to get their HIV test results increase the risk of losing the client before he or she is informed of the test result.

Moreover, the review has shown that the majority of people in MENA learn their HIV status through mandatory testing. Out of tens of millions of HIV tests conducted in the region since 1995, only a little over 400,000 were administered through VCT. All countries of the region (except Djibouti and Morocco, which do mandatory testing only on military recruits to establish physical fitness) have mandated HIV testing for different purposes including preoperative, pre-employment, in-migration, and

²⁴ Semini, Njogou, and Mortagy, *UNHCR/UNAIDS Joint Mission*.

²⁵ UNAIDS/APMG, *Recommendations for Interventions*.

²⁶ Lebanon National AIDS Control Program, "A Case Study."

²⁷ WHO/EMRO, "Regional Review of HIV Testing."

high-risk populations upon arrest or admission to health care. The consequences of positive HIV test results can be deportation of migrant workers, denial of visa, or denial of health care services.

Provider-initiated testing and counseling (PITC) is rarely adopted. Where it is reportedly undertaken in health care settings (for example, in tuberculosis clinics, antenatal clinic services, surgical units, STI clinics, and others), PITC is often confused with mandatory screening, where the requirement for consent is not respected.

EXPANDING COVERAGE

Currently, scaled-up and decentralized HIV prevention programs are the exception to the rule in MENA. Partially due to the fact that the current HIV prevention programs for priority populations are nascent in the region, current efforts are mainly patchy projects providing access to populations in selected areas of urban cities. The programs that have expanded in various regions of Morocco demonstrate the feasibility of scaled-up programs for those involved in sex work, even in a stringent context. In Morocco in 2007, 51.8% of FSWs were tested in VCT centers and received the result. Of the above, 53.2% declared using a condom during the last sexual contact compared to 37.5% in 2003.

Massive efforts are needed to address the challenges impeding coverage expansion and the implementation of quality and focused HIV prevention programs. One of the challenges of scaling up programs for HIV prevention is the variety of contexts where risk behaviors take place. People involved in sex work are not a homogeneous group, existing networks relate to subpopulations (those working in the streets, hotels, and so forth), and various motivations and several underlying factors determine involvement in sex work. The variations among existing networks make it even more challenging to inform an effective programmatic approach. In the MENA context, current programs reach only a few subpopulations of FSWs, drug users, and MSM, mainly determined by the initial entry point of how these populations were reached.

Information generated by situation assessments in terms of underlying vulnerability factors and context variety needs to be effectively used

to adapt programs to the needs of people most at risk and expand coverage and intensity to reach all of those in need. Adapted programmatic approaches are necessary to provide services to those in bars, residences, streets, and other high-risk areas. Biobehavior information disaggregated on settings and specific geographical locations at higher risk needs to take into account the geographical variations to determine the priority settings and focus of expanded HIV prevention. As an example, in Morocco, HIV prevalence among sex workers is substantively higher in Marrakesh and Agadir, while IDU is prevalent in Tangier and Tetouan, and this information should be used in planning prevention programs in each setting. In Algeria, Tamanrasset and Tiaret are characterized by a considerably higher HIV prevalence rate among FSWs compared to other regions (9% in Tamanrasset, 3%–8% in some regions in 2004–07, and 11% in Tiaret²⁸), and the NSP for 2008–12 places a priority focus on programs for sex work in these selected areas.

CIVIL SOCIETY AND PEOPLE LIVING WITH HIV AS IMPLEMENTATION PARTNERS

A wider proliferation of NGOs and community-based organizations to help implement HIV prevention programs will improve HIV prevention services and programs and help focus these programs on priority populations that are harder to reach. There is a limited presence of NGOs and community organizations implementing HIV prevention, particularly for people most at risk, and this significantly hinders the decentralization and expansion of service coverage. Pioneering NGOs have initiated breakthrough projects on HIV prevention; however, their scope and coverage remain limited.

Thus, it is essential that other NGOs and community-based organizations are identified in the priority areas and are trained to deliver HIV prevention services and information to people most in need. These NGOs can be developmental partners working on thematic other than AIDS that have community access and the trust of the populations, but not necessarily the required competence on HIV-related services.

²⁸ Algeria National AIDS Council, "Algeria National Strategy."

Despite an environment of limited awareness, apprehension, and stigma associated with HIV/AIDS, associations of people living with HIV (PLHIV) have now emerged as partners in more than 10 countries of the region. Civil society organizations and, in some cases, the national AIDS programs have contributed to establishing support groups and associations for PLHIV in recent years. In countries such as Algeria, Djibouti, Morocco, and Sudan, socioeconomic support mechanisms have also been put in place through joint government and civil society initiatives, including for a sizable number of orphaned children in Djibouti. The role of people living with HIV and their association as equal partners is essential to ensure access to HIV prevention, treatment, care, and support services.

From evidence to programs

Translating evidence generated through research, biobehavior surveys, and surveillance into adapted programming is essential to devise an optimal combination of interventions tailored to the needs of concerned populations.

Overlapping risks have been documented (chapters 2–4); however, few programs include a comprehensive package of interventions and referral to services to address the needs of people who are exposed to multiple risks. Such packages need to be an integral part of prevention programs and are crucial to averting an epidemic. Specific programming and focus are necessary to address the needs of these subpopulations.

Strikingly, there appears to be considerable multiplicity and overlap of risk factors in urban settings in MENA, including injecting drug use and unprotected sexual contacts (chapter 2). The overlap of sexual and drug injecting risks, which was featured in nearly all of the behavioral surveys among drug users,²⁹ and was also documented among FSWs and MSM, could spark more serious HIV outbreaks across populations at a time when consistent condom use is strikingly low. Over 40% of drug users in Algeria, 36% in Cairo, and 33% in Lebanon had engaged in sex work contacts in the month preceding the interview, with the reported use of condoms

being inconsistent or nonexistent among the vast majority. In Afghanistan, more than 70% of IDUs surveyed in Kabul had paid women for sex, while condom use is exceptionally low in the country.³⁰ Conversely, in the Syrian Arab Republic, 10% FSWs reported drug injection.³¹

A study in Alexandria, Egypt, showed that 10.9% of MSM had injected drugs in the previous 12 months.³² High-risk sexual practices were also prevalent, with 53% of drug users interviewed in Syria having engaged in sex work, and 40% of the sexually experienced had never used a condom, while only 20% had done so consistently.³³ Likewise, among a sample of IDUs in treatment in the Islamic Republic of Iran, most were sexually active and exchanging money for sex was not uncommon, yet almost half of them had never used a condom.³⁴ However, few programs integrate adapted approaches to address the multiple and overlapping risks. The NGOs providing HIV prevention services to FSWs in Egypt, despite the holistic approach adopted and the willingness to address the needs of women who also inject drugs, do not provide drug injection–related HIV prevention information and material as part of the prevention package, nor have they the capacity to do so. A few programs on drug use and HIV have included a focus on sexual risks, with limited integration of education about sexual risks or condom provision.

This lack of integration in adapted approaches is also due to the focus and capacities of the NGOs implementing the HIV prevention programs. Involving the concerned communities in planning the prevention services and management of implementation will help to redeem the programming shortfalls.

In almost all of the MENA countries, an impediment to measuring progress and determining the priorities for prevention programs is the absence of monitoring and evaluation (M&E) systems to assess program impact over time. Integrating data collection from the inception of the program, using the data to inform the program and national M&E system,

²⁹ UNAIDS, UNODC, and WHO, "Fact Sheet on Drug Use."

³⁰ Todd et al., "Prevalence of Human Immunodeficiency Virus."

³¹ Syria National AIDS Programme, "HIV/AIDS Female Sex Workers."

³² Egypt Ministry of Health and Population, and National AIDS Program, *HIV/AIDS Biological and Behavioral Surveillance Survey*.

³³ Syria Ministry of Health, UNODC, and UNAIDS, "Assessment on Drug Use and HIV in Syria."

³⁴ Zamani et al., "Prevalence."

and the participation of concerned populations will yield much-needed information on service delivery and prevention progress.

Scope, quality, and outreach are essential for sustainable HIV prevention programs

Because HIV prevention efforts need to focus on the people who are likely to be reluctant to approach facility-based services, outreach and peer education are the keys to providing these hard-to-reach people with information and services.

Experience confirms that it is essential that outreach workers come from the concerned communities; this helps to ensure behavior change and empowers the communities themselves. Health and social workers, and NGO volunteers face increasing challenges to establish regular contacts and deliver HIV prevention messages to IDUs in Egypt, while ex- and active IDUs have proven to be very efficient and trusted by the communities, leading to increased adoption of safe methods.

Outreach is an efficient technique for getting information and services to people who need them most. However, high rotation and change of personnel over time hampers effective and quality behavior change interventions, because there is limited incremental experience in the implementing partner institutions. The complexities and challenges are magnified as the programs try to expand coverage. In addition to management challenges, maintaining a core mass of outreach workers with adequate, updated skills is proving difficult.

Education and referral for large HIV prevention programs demand significant resources, and continuous training quality may be affected over time. While recognizing the necessity of ensuring that outreach workers are peers of the populations being engaged, programs in MENA should try to institutionalize outreach work to ensure their sustainability and long-term impact on HIV prevention.

BLOOD SAFETY AND UNIVERSAL PRECAUTIONS

Infections as a result of blood products, blood transfusion, and lack of infection control measures

in health care settings are generally on the decline, although this mode of transmission continues to be present in a small number of countries. Overall, the percentage of reported HIV and AIDS cases attributed to contaminated blood has fallen from 12.1% in 1993 to 0.4% for the entire MENA region in 2003.³⁵

According to countries' universal access indicator reports for 2007, the screening of donated blood was fully operational at 100% in all facilities in Djibouti, the Islamic Republic of Iran, Iraq, Jordan, Lebanon, Oman, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, and the United Arab Emirates.³⁶ Afghanistan and Pakistan report that 39% and 87%, respectively, of donated blood units were screened for HIV in a quality assured manner.³⁷ No data were available for Sudan, the West Bank and Gaza, and the Republic of Yemen.³⁸

HIV CARE AND TREATMENT

By 2005, in the majority of MENA countries, ART was available at least at one central health facility. During the following years, access to ART was expanded to include low-income countries that had succeeded in mobilizing donor support through the GFATM.

The introduction of ART had an almost immediate and visible impact on the quality of life of PLHIV, which was also evident in the reduced mortality rates. In Tunisia, the mortality of AIDS patients fell from 45% to 7.8% between 2000 and 2003. However, the gap between PLHIV receiving treatment and the overall estimated need for treatment has remained substantial.

Based on the most recent UNAIDS and World Health Organization (WHO) estimates, at the end of 2008, approximately 151,000 PLHIV were in need of ART in MENA³⁹; two-thirds of them are living in Pakistan and Sudan. Only 9,622 PLHIV in need of ART were reportedly receiving treatment.⁴⁰ Accordingly, in 2007, the

³⁵ UNAIDS, "Notes on AIDS in the Middle East and North Africa."

³⁶ WHO/EMRO, "Progress towards Universal Access" (2007).

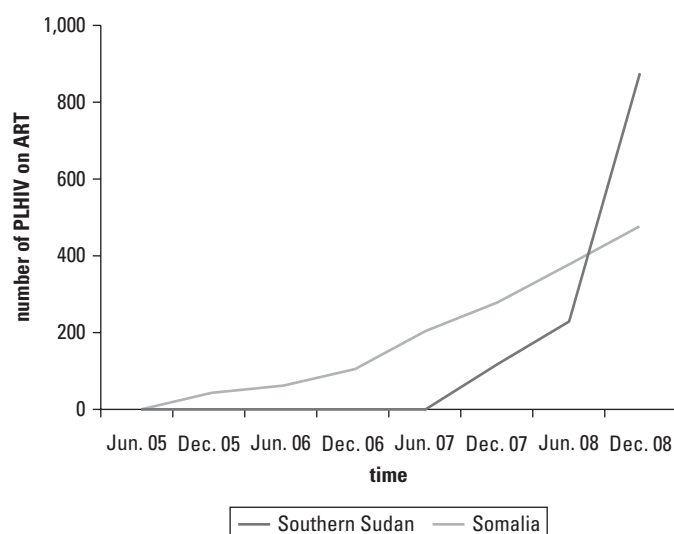
³⁷ Ibid.

³⁸ WHO/EMRO, "Progress towards Universal Access" (2006); WHO and EMRO, "Progress towards Universal Access" (2007).

³⁹ WHO, UNAIDS, and UNICEF, "Towards Universal Access."

⁴⁰ WHO/EMRO, "Progress towards Universal Access" (2007).

Figure 12.1 ART Scale Up in Somalia and Southern Sudan between 2005 and 2008



Source: WHO/EMRO. Country data reported to the WHO Office of the Eastern Mediterranean Region.

Table 12.1 Number of PLHIV on ART in Selected Countries, 2006–08

Country	2006	2007	2008
Djibouti	578	705	816
Iran, Islamic Rep. of	522	827	921
Morocco	1,370	1,648	2,207
Pakistan	164	523	907
Somalia	111	211	413
Sudan	986	1,198	2,317
Yemen, Republic of	0	107	189

Source: WHO/EMRO Regional Database on HIV/AIDS; WHO/EMRO 2008a.

regional ART coverage of the estimated need was 6%, the lowest among all regions. By 2008, all countries in MENA, except for Afghanistan, Iraq, and the West Bank and Gaza, had established HIV care and treatment services and were steadily expanding access to ART (table 12.1).⁴¹

Experience with establishing and expanding access to HIV care and treatment in Southern Sudan and Somalia shows that providing ART is possible, even in very difficult contexts. Southern Sudan initiated its HIV care and treatment program by mid-2007, and by December 2008, almost 1,000 of the PLHIV received ART.⁴²

Somalia started in June 2005, and by the end of 2008, more than 500 of the PLHIV were receiving ART (figure 12.1).⁴³

A main reason for the low ART coverage in MENA is that a very small proportion of PLHIV know their HIV status, and approximately 80% of PLHIV known to the health care system to be in need of ART are actually receiving treatment.⁴⁴ At local and regional meetings of support groups, PLHIV frequently voice their fear of nonconfidentiality if they disclose their HIV status to health service providers and the resulting stigma and discrimination they could face within the health system, their workplaces, and communities. Accordingly, there is reason to assume that a considerable proportion of PLHIV who know their HIV status try to avoid contact with the public health system and attempt to find access to treatment in the private sector or outside their countries. The limited ability of most countries to implement interventions for reaching high-risk populations is likely to considerably affect access to and use of HIV VCT, and therefore impact treatment.

Large gaps in geographical coverage of ART services are another reason for the low treatment coverage in MENA countries with the highest burden of HIV. In 2007, per 1,000 PLHIV in need of ART, 1.5 health facilities

⁴¹ WHO/EMRO Regional Database on HIV/AIDS.

⁴² WHO/EMRO, data reported to the WHO Office of the Eastern Mediterranean Region.

⁴³ Ibid.

⁴⁴ WHO/EMRO, "Survey on Status."

offered ART in Pakistan, 0.9 in Somalia, 0.4 in Sudan, and 0.6 in the Republic of Yemen.⁴⁵

Treatment outcomes reported by country ART programs in low-income countries in the region are comparable to globally reported outcomes. In 2008, the reported survival rate of PLHIV on ART during one year was 92% in Pakistan and ranged between 72% and 91% in Djibouti, the Islamic Republic of Iran, Morocco, Somalia, and the Republic of Yemen.⁴⁶

Despite rather newly established national ART programs and low ART coverage, some countries, such as the Islamic Republic of Iran and Pakistan, already report a high proportion (greater than 10%) of patients receiving second line ART, indicating the emergence of HIV drug resistance.

Good adherence to ART has been observed in Morocco,⁴⁷ though noncompliance and treatment interruptions have been observed, for example, in Oman.⁴⁸ Some of the identified challenges to adherence are the difficulty in following the administration schedule, long distances between home and ART services, or the presence of adverse effects.⁴⁹ This suggests the need for education and counseling programs to ensure that patients understand ART and thereby improve adherence.⁵⁰ There is also evidence of obtaining drugs with no prescription and no clinical and psychosocial support.⁵¹ Some countries report problems such as drug stock outs, lack of second line drugs, over-centralization of services, and lack of comprehensive care and psychosocial support.⁵²

Few countries are implementing HIV drug resistance monitoring and surveillance activities, according to the WHO global strategy. In 2008, only Djibouti published an annual report on HIV drug resistance early warning indicators.⁵³

HIV MOTHER-TO-CHILD TRANSMISSION

In 2008, half of the MENA countries had established national programs for prevention of

mother-to-child transmission (PMTCT), compared to one-third in 2006.⁵⁴ However, major challenges remain to ensure the effectiveness of PMTCT programs, including low antenatal care attendance rates in some countries, geographical availability of PMTCT services, provision of HIV testing and counseling in antenatal care clinics (opt-out approach), antiretroviral (ARV) prophylaxis regimen efficacy, and retention of women and children in PMTCT services. According to reports on universal access indicators in 2008 from Jordan, Morocco, Somalia, Sudan, and the Republic of Yemen, less than 1% of the estimated total number of pregnant women underwent an HIV test. Based on the same reports, between less than 1% and 24% of the estimated number of HIV-positive pregnant women received antiretroviral prophylaxis to reduce the risk of mother-to-child HIV transmission in the Islamic Republic of Iran (23.6%), Morocco (14.3%), North Sudan (0.2%), Pakistan (0.02%), Somalia (0.3%), and the Republic of Yemen (0.4%).⁵⁵

PREVENTION AND CONTROL OF STIs: CURRENT RESPONSE AND CHALLENGES

According to information on the status of STI surveillance and control obtained from focal points in the ministries of health, surveillance is limited or not established in most MENA countries. Only one country (Morocco) reported establishing a surveillance system that makes it possible to chart trends, quantify the situation, guide program planning, and assess the impact of interventions (chapter 10). Thus, reliable data on STIs are not often available in the region.

The degree to which MENA countries have already established STI control programs and their ability to implement recommended STI prevention and control interventions, in terms of available political support, resources, and systems, vary widely. Most STI programs are not appropriately equipped with human and financial resources. According to an unpublished review of the STI response conducted by the World Health Organization Eastern Mediterranean Regional Office (WHO/EMRO), 12 countries (Afghanistan, Bahrain, Djibouti, Egypt, the

⁴⁵ WHO/EMRO, "Progress towards Universal Access" (2007).

⁴⁶ WHO/EMRO, "Progress towards Universal Access" (2007); WHO/EMRO, "Progress towards Universal Access" (2008).

⁴⁷ Benjaber, Rey, and Himmich, "A Study on Antiretroviral Treatment."

⁴⁸ Al Dhahry et al., "Human Immunodeficiency Virus."

⁴⁹ Benjaber, Rey, and Himmich, "A Study on Antiretroviral Treatment."
⁵⁰ Ibid.

⁵¹ Shah et al., "Antiretroviral Drugs."

⁵² UNAIDS, "Notes on AIDS in the Middle East and North Africa."

⁵³ Djibouti National AIDS Programme, "Programme de lutte contre le sida."

⁵⁴ WHO/EMRO, "Progress towards Universal Access" (2007).

⁵⁵ WHO/EMRO, "Progress towards Universal Access" (2008).

Islamic Republic of Iran, Iraq, Morocco, Oman, Pakistan, Saudi Arabia, Somalia, and the West Bank and Gaza) reported having a national strategy for STIs. Only five countries (Bahrain, the Islamic Republic of Iran, Morocco, Pakistan, and Saudi Arabia) have a national action plan to implement these strategies and have allocated more than 50% of the funds required for the response from the national health budget.

STI interventions currently being implemented in several countries often do not build on evidence-based, effective public health approaches, as recommended in the global strategy for the prevention and control of STIs. According to a survey carried out by WHO/EMRO in 2008, 13 countries have implemented the syndromic approach for STI case management, but only 6 (Djibouti, Egypt, Jordan, Morocco, Pakistan, and Somalia) have carried out etiological studies to validate the WHO flowcharts relating to the syndromic approach.⁵⁶

The same survey found that most countries in the region do not provide any special STI services for priority populations. Only six countries (Djibouti, Egypt, Jordan, Morocco, Pakistan, and Sudan) have implemented an outreach peer education program among sex workers. Egypt, Morocco, and Pakistan also provide special consultation and treatment services for this group. Any response that does not address priority populations, such as FSWs, MSM, and IDUs, will fall short of having any significant impact on the spread of STIs in MENA. As in other regions, STI and HIV transmission are concentrated among groups that have higher rates of partner change and higher-risk behaviors than the general population. Although these groups are socially marginalized, the infection spreads to the general public via other population subgroups, known as bridging populations, which connect the higher-risk groups (such as clients of sex workers) and the general population.

CONCLUDING REMARKS AND SUMMARY OF FINDINGS

HIV prevention and treatment efforts in MENA continue to be rather limited despite recent improvements. Ample efforts continue to be

focused on the general population despite the limited HIV prevalence in this population. Coverage of and access to HIV prevention services among priority populations continue to be far below the needs. Access to HIV treatment varies and is among the lowest globally.

A key structural problem in MENA is the poor mapping of risk, vulnerabilities, and HIV infection in the population. Most HIV infections are not diagnosed until years after infection. There is an urgent need for all MENA countries to develop robust surveillance systems for HIV and STIs and to base their policies on the epidemiological outcome of this surveillance. Due to the absence of such surveillance, resources are not being allocated according to need.

Essential to transforming social attitudes in MENA is the growing participation of PLHIV in the national response. Prevailing stigma and discrimination in relation to HIV/AIDS have been a serious impediment to the proliferation and visibility of the HIV engagement of civil society and other nongovernmental partners. However, MENA has witnessed a growing movement of PLHIV over the past few years.

Walking the fine line between law enforcement and public health will necessitate strong political commitment and a solid and effective partnership between different sectors, such as the police, national AIDS programs, NGOs, and communities. Without a multisectoral approach and partnerships with civil society, key populations, and PLHIV, the HIV response in MENA will be severely limited in its ability to control HIV spread.

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⁵⁶ WHO/EMRO, "Technical Paper."

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Summary of Recommendations

This chapter focuses on key strategic recommendations related to the human immunodeficiency virus (HIV) epidemiology in the Middle East and North Africa (MENA) presented in this report. The following recommendations are based on the identification of the HIV epidemic status in MENA, through this synthesis, as a low HIV prevalence setting, but with rising concentrated epidemics among priority populations. General directions for prevention interventions as warranted by the outcome of this synthesis are also briefly discussed, but detailed recommendations are beyond the realm of this report. It is not part of the scope of this report to provide intervention recommendations for each MENA country.

RECOMMENDATION 1: INCREASE AND EXPAND BASELINE AND CONTINUED SURVEILLANCE

The data synthesis and HIV transmission concentration in priority populations, as described in this report, highlight the need for HIV surveillance of these at-risk groups. However, resistance to acknowledging the existence of priority populations including injecting drug users (IDUs), men who have sex with men (MSM), and female sex workers (FSWs) can still be found among stakeholders in MENA. The low HIV prevalence found in sporadic and

nonrepresentative populations at low risk of infection, such as blood donors, is feeding a culture of complacency toward the epidemic that is blind to the reality of nascent HIV epidemics in hard-to-reach and stigmatized populations. The low HIV prevalence in the general population may mask a much higher prevalence in priority populations.

HIV is not spreading evenly among the different subpopulations within each MENA country. Finding the subpopulations where HIV is currently spreading is a key challenge.¹ Inadequate surveillance continues to be one of the most pervasive problems in the region.² Despite recent progress in several countries such as Morocco and Sudan, epidemiological and methodological surveillance remains limited.³ Although surveillance has been expanded to include sentinel surveillance of pregnant women in a few countries, efforts need to be expanded and focused on surveillance of priority and vulnerable populations, including the mapping of risk and vulnerability factors, risk behavior measures, population size estimations, and, importantly, measurements of HIV prevalence and biomarkers of risk such as sexually transmitted infections (STIs) and hepatitis C virus (HCV) prevalence levels. Mapping of priority populations is a necessary prerequisite to prevention efforts among these groups. The

¹ El Feki, "Middle-Eastern AIDS Efforts."

² UNAIDS and WHO, *AIDS Epidemic Update 2006*.

³ Obermeyer, "HIV in the Middle East."

surveillance system must be tailored to the epidemic state of each country.⁴

Integrated biobehavioral surveillance surveys (IBBSS) of representative priority populations should be the main component of surveillance efforts,⁵ rather than relying on facility-based surveillance using convenient population samples. This is particularly true in settings of low prevalence or concentrated HIV epidemics, as is the case in MENA.⁶ Resources should not be wasted on surveillance of low-risk populations while overlooking HIV spread in priority populations. Surveillance systems in the former Soviet republics focused on pregnant women and tested millions of them, but found very limited HIV spread.⁷ At the time, HIV was raging among IDUs.⁸

Repeated IBBSS monitors trends over time by combining HIV sero-surveillance with biomarker surveillance and risk behavior surveillance.⁹ This allows pinpointing of windows of opportunity for early intervention when necessary.¹⁰ Biomarker surveillance, such as that of herpes simplex virus 2 (HSV-2) and HCV, is an indispensable component of HIV surveillance. This facilitates the collection and analysis of essential data needed for programming interventions and evaluating impact.

The surveillance should be appropriate for the phase of the epidemic and focus resources where they can provide the most useful data. Biological and behavioral data should be used to validate one another, and information from other sources as well should be integrated within the surveillance system. Programmatic data from voluntary counseling and testing (VCT) and antiretroviral therapy (ART) clinics can also inform epidemic patterns. This allows a deeper understanding of the factors involved in emerging epidemics. In other words, “know your epidemic,” and at a local level.¹¹

RECOMMENDATION 2: EXPAND SCIENTIFIC RESEARCH AND FORMULATE EVIDENCE-INFORMED POLICIES

This data synthesis highlights a large gap in methodological, scientific research in relation to HIV and other STI epidemiology in MENA. Although scientific research is often recognized in HIV national policies,¹² limited human and financial resources are key challenges. In turn, this is preventing the region from formulating effective and evidence-informed policies.¹³

MENA also has a poor record in utilizing existing sources of data. Valuable data sources are often ignored even though they can provide useful insights into HIV dynamics and trends. For instance, methodological analyses of the millions of HIV tests that are conducted yearly may provide hints about populations where HIV incidence is increasing. The depth and breadth of these analyses would significantly increase if HIV tests were supplemented with the collection of basic demographic and behavioral data and if additional serological tests, such as for HSV-2, were conducted on subsamples of these tests.

In terms of research priorities, the first priority is conducting repeated multicenter IBBSS studies of priority groups to monitor trends over time, combining HIV sero-surveillance with STI, HCV, and risk behavior surveillance. These studies also need to explore the network structures among these risk groups, including both sexual and injecting drug networks.

The second priority is research on mapping and size estimation of hard-to-reach priority populations because this will be essential for the quantitative assessments of HIV epidemiology and trends and would help in planning more effective prevention strategies and programs.

The third priority is conducting multicenter cohort or cross-sectional studies of the vulnerable populations, particularly the youth, to assess HIV and other STIs' incidence, other infectious disease incidence such as HCV, sexual and injecting drug use risk behaviors, and drivers of risky behavior. With the high rates of population mobility in MENA, it is also informative to assess the levels of risky behavior and infection

⁴ Pisani et al., “HIV Surveillance.”

⁵ UNAIDS and WHO, *Guidelines*; Reider and Dehne, “HIV/AIDS Surveillance”; Sun et al., “The Development of HIV/AIDS Surveillance in China.”

⁶ Ghys, Jenkins, and Pisani, “HIV Surveillance.”

⁷ Pisani et al., “HIV Surveillance.”

⁸ *Ibid.*

⁹ Reintjes and Wiessing, “2nd-Generation HIV Surveillance.”

¹⁰ Pisani et al., “HIV Surveillance.”

¹¹ Wilson and Halperin, “Know Your Epidemic.”

¹² SNAP, *National Policy on HIV/AIDS*.

¹³ Khan and Hyder, “Responses to an Emerging Threat.”

among migrants because data on this population remain rather limited, and the socioeconomic context of migration in this region may predispose this population to risk behavior practices.

The fourth priority is conducting mathematical modeling and cost-effectiveness studies to explore the full range of the complex HIV dynamics and intervention impacts in MENA. These studies would build inferences and suggest policy recommendations by utilizing the individual and population-level data that will become increasingly available over the next few years from surveillance studies on priority populations.¹⁴

RECOMMENDATION 3: FOCUS ON RISK AND VULNERABILITY, NOT ON LAW ENFORCEMENT

MENA has a history of approaching challenges through a “security” prism and often stakeholders believe that the HIV question is a question of law enforcement to prevent risk practices. This is at odds with the reality gleaned from this synthesis. HIV is merely a reflection of existing contours of risk and vulnerability in the societies in which it is spreading and cannot be addressed fundamentally except by addressing the underlying causes of these risks and vulnerabilities. Sex work, for example, is a reflection of demand and supply mechanisms where the existence of a massive bulge of single and often unemployed youth, and omnipresent pockets of wealth, are creating strong demand for sex work, and on the supply side, the large income disparity, poverty, and complex emergencies are fueling an ample supply of sex workers. Repressive measures on priority populations will only complicate efforts, increase hidden risky behaviors, and discourage these populations from seeking aid and information. This would not change the vulnerability settings, but would deprive us of the ability to control the epidemic and administer prevention interventions as needed.

The failure of the “security” approach is manifest in the case of injecting drug use. For a long time the region depended on failed supply-reduction policies that focused on criminalizing drug use.¹⁵ This only acted to exacerbate the

problem. In Libya, restrictions imposed on the sale of needles and syringes at pharmacies in the late 1990s contributed to an increase in the use of nonsterile injecting equipment and led consequently to a rapid growth of HIV infections among IDUs since 2000.¹⁶ Following this policy failure, Libya has made progress in moving to harm reduction policies.¹⁷ The Islamic Republic of Iran passed through a similar path of policy failure only to become a world leader in a much celebrated harm reduction approach.¹⁸ Use of nonsterile equipment decreased by half in the Islamic Republic of Iran after making needles and syringes easily available in pharmacies.¹⁹

Policy, programs, and resources continue to be diverted from where they are needed. The mandatory testing of many population groups at low risk of HIV infection is disconnected from the epidemiological reality of HIV infection in the region. Some of this testing may also violate basic human rights and is likely not effective from a public health perspective. Efforts need to be prioritized to the contours of risk and vulnerability and focus on priority groups. Recognizing the settings of risks and targeting them with effective interventions is the only available path for controlling HIV spread in MENA.

RECOMMENDATION 4: STRENGTHEN CIVIL SOCIETY CONTRIBUTIONS TO HIV EFFORTS

The contribution of civil society to HIV prevention efforts remains limited in MENA despite recent progress. One of the structural weaknesses of the HIV response is the meager contribution of nongovernmental organizations (NGOs), community organizations, and people living with HIV (PLHIV) groups in the formulation, planning, and implementation of the response. Strengthening civil society contributions to HIV efforts is essential due to the epidemiological reality of HIV transmission

¹⁴ American University, “Reaching ‘Hard to Reach’ Population.”

¹⁵ Razzaghi et al., “HIV/AIDS Harm Reduction in Iran.”

¹⁶ Tawilah and Ball, “WHO/EMRO & WHO/HQ Mission.”

¹⁷ Razzaghi et al., “HIV/AIDS Harm Reduction in Iran”; Butler, “Libya Progresses on HIV.”

¹⁸ Zamani et al., “Prevalence”; Razzaghi et al., “HIV/AIDS Harm Reduction in Iran”; Ministry of Health and Medical Education of Iran, “Treatment and Medical Education”; Afshar, “From the Assessment to the Implementation”; Afshar and Kasraee, “HIV Prevention Experiences”; WHO/EMRO, “Best Practice.”

¹⁹ UNAIDS and WHO, *AIDS Epidemic Update 2004*.

being concentrated in priority groups, as delineated in this synthesis.

Despite this limitation, the region has seen the foundation of a number of effective NGOs working on HIV efforts in recent years. By the mid-1990s, there were at least 100 NGOs in MENA involved in HIV/AIDS prevention and education, although with limited capacity.²⁰ There are a growing number of NGOs and associations in countries such as Algeria, Djibouti, the Arab Republic of Egypt, the Islamic Republic of Iran, Jordan, Lebanon, Morocco, and Sudan. These organizations provide much needed support for HIV prevention and treatment, including outreach centers for IDUs, FSWs, and MSM.

Some of the NGOs have made impressive achievements, such as the comprehensive harm reduction approach by the Iranian NGO Persepolis that provides needle exchange, methadone maintenance, general medical care, VCT, and referral.²¹ In the Islamic Republic of Iran, NGOs have played a leading role in the transformation to effective policies as well as the promotion of close cooperation between health authorities, prison departments, judiciary authorities, academic institutions, religious leaders, and other stakeholders.²²

Another achievement is Helem in Lebanon, the first and only aboveground organization working with MSM in MENA.²³ Helem has made admirable contributions in addressing the health, legal, psychological, and social needs of MSM, by far the most culturally sensitive group of all priority groups.²⁴ Helem is also involved in scientific surveillance research work and VCT efforts with MSM.²⁵ In Djibouti, there have been a number of initiatives to address the high-risk behaviors among truck drivers and FSWs along the trade corridor, such as the High Risk Corridor Initiative.²⁶

The attitude toward NGOs from outside the region can be negative among MENA populations.²⁷ There is no escaping the fact that grassroots NGOs need to be developed within MENA. Considering the cultural sensitivity of working with priority groups, a successful formula for HIV efforts may be government organized NGOs (GONGOs), where governments fund and support NGOs to discreetly provide services to priority groups, such as sex worker self-help groups.²⁸ NGOs may enable governments to deal with priority groups indirectly, thereby avoiding cultural sensitivities in explicit outreach efforts among stigmatized populations.²⁹ Discreet interventions for HIV prevention have been proven effective in Bangladesh,³⁰ Lebanon,³¹ Morocco,³² and Pakistan.³³

RECOMMENDATION 5: AN OPPORTUNITY FOR PREVENTION

There is still an opportunity for prevention that should not be missed to avert a larger epidemic³⁴ and avoid the health and socioeconomic cost that the MENA region is largely unprepared to pay.³⁵ It appears that there is increasingly a political feasibility for implementing and scaling up interventions, including those involving priority populations.³⁶ Resources need to be allocated for interventions for the priority populations irrespective of whether these groups are “culturally safe” or not.³⁷ Developing mechanisms for working with priority populations, even if discreetly, need to be explored. Efforts in MENA continue to be focused on awareness-raising activities among the general population, which is the group at the lowest risk of infection.

²⁰ Wahdan, “The Middle East.”

²¹ Razzaghi et al., “HIV/AIDS Harm Reduction in Iran”; Vazirian et al., “Needle and Syringe Sharing.”

²² Razzaghi et al., “HIV/AIDS Harm Reduction in Iran”; Ohiri et al., “HIV/AIDS.”

²³ Lebanon National AIDS Control Program, “A Case Study” (2008a).

²⁴ International HIV/AIDS Alliance, “Supporting Men Who Have Sex with Men in Lebanon,” <http://www.aidsalliance.org/sw51051.asp>, accessed on January 12, 2007.

²⁵ Mishwar, “An Integrated Bio-Behavioral Surveillance Study”; Lebanon National AIDS Control Program, “A Case Study” (2008a); Lebanon National AIDS Control Program, “A Case Study” (2008b).

²⁶ O’Grady, “WFP Consultant Visit to Djibouti Report.”

²⁷ Blowfield, “Fundamentalists Call the Shots.”

²⁸ Jenkins, “Report on Sex Worker Consultation in Iran.”

²⁹ Razzaghi et al., “HIV/AIDS Harm Reduction in Iran”; Vazirian et al., “Needle and Syringe Sharing.”

³⁰ Jenkins et al., “Male Prostitutes.”

³¹ Jenkins and Robalino, “HIV in the Middle East and North Africa.”

³² Tawil et al., “HIV Prevention”; Boushaba et al., “Marginalization and Vulnerability.”

³³ Jenkins et al., “Male Prostitutes.”

³⁴ Khawaja et al., “HIV/AIDS and Its Risk Factors in Pakistan”; World Bank, “Preventing HIV/AIDS in the Middle East and North Africa”; Zaheer et al., “STIs and HIV in Pakistan.”

³⁵ Jenkins and Robalino, “HIV in the Middle East and North Africa.”

³⁶ Buse, “Political Feasibility of Scaling-Up.”

³⁷ UNAIDS, “Notes on AIDS in the Middle East and North Africa”; Jordan National AIDS Program, “National HIV/AIDS Strategy for Jordan 2005–9.”

There is a need to invest in comprehensive analysis of the current gaps of as well as intervention opportunities for the HIV response. This can be started by combining implementation of the transmission modes analysis for each country with the mapping of current interventions, including the taxonomy of prevention.

To maximize intervention impact, emphasis should be on using existing resources, such as integrating STI prevention into the reproductive health programs. Blood banks and facilities can also help in communicating blood-borne virus prevention messages.³⁸

Interventions need to capitalize on the strengths represented by cultural traditions, and yet be culturally sensitive while fostering effective responses to the epidemic.³⁹ Interventions among IDUs, including those in prison, such as needle and syringe exchange, opioid substitution therapies, and HIV testing and counseling, have shown effectiveness against HIV infection⁴⁰ and need to be expanded. Lessons also need to be learned from other successful experiences in the control of sexually transmitted diseases, particularly from resource-limited settings.⁴¹

Intervention methodology should emphasize identifying places, rather than individuals, where high-risk sexual or injecting activities are present.⁴² In this fashion, the central and key nodes of risk networks, instead of the peripheral ones, can be reached and used as a springboard for interventions such as condom distribution.⁴³ This would also help targeting the “cut points” and the “bridges” between subcomponents in sexual and injecting networks where interventions are most needed and effective.⁴⁴

Access to testing, care, and treatment services should be expanded substantially. It is imperative to remove all barriers to HIV testing and diagnosis, particularly among priority groups, to

impede the transmission chains driven by the short primary stage of infection following HIV infection.⁴⁵ Molecular epidemiology studies and quantitative assessments of priority populations have shown high levels of genetic clustering where at least 25% of HIV infections originate from HIV-positive persons in their primary infection.⁴⁶ It is believed that the large disparity in HIV testing and diagnosis between Caucasian and African American MSM in the United States is a key determinant of the striking difference in HIV incidence among these two racial groups.⁴⁷ Anonymous testing needs to be expanded, and it has already proved its utility in attracting hidden populations.⁴⁸

Although countries need to address the structural factors that drive risk behavior practices, the priority in the public health sector should be on addressing the direct factors that put individuals at risk of HIV exposure, because tackling structural factors takes time and is beyond the control of the public health community.⁴⁹ Because almost all infections occur when an infected individual shares body fluids with an uninfected individual, prevention programs must focus on addressing the situations in which this is happening.⁵⁰ Careful analysis of the transmission patterns must be conducted to inform policy decisions.⁵¹

Beyond doubt, *harm reduction* should be at the core of intervention policy, and targeted prevention should go further than harm reduction. The concept of harm reduction should be applied not only to IDUs, but should also be considered for MSM and FSWs as well. Harm reduction is a direct and effective strategy to stem the tide of HIV, considering that addressing the root causes of risks and vulnerabilities might be a much more challenging task. The Islamic Republic of Iran has already paved the way by showing how harm reduction can be implemented within the cultural fabric of MENA and in consonance with religious values.

³⁸ Razzaghi et al., “Profiles of Risk.”

³⁹ Obermeyer, “HIV in the Middle East”; Lazarus et al., “HIV/AIDS Knowledge and Condom Use”; Aden, Dahlgren, and Guerra, “Experiences against HIV/AIDS/STDS.”

⁴⁰ Des Jarlais et al., “HIV Incidence”; Metzger et al., “Human Immunodeficiency Virus Seroconversion”; van Ameijden et al., “Interventions among Injecting Drug Users”; Jurgens, Ball, and Verster, “Interventions to Reduce HIV Transmission.”

⁴¹ Cohen et al., “Successful Eradication of Sexually Transmitted Diseases.”

⁴² Weir et al., “From People to Places.”

⁴³ Doherty et al., “Determinants and Consequences of Sexual Networks.”

⁴⁴ Wasserman and Faust, *Social Network Analysis*.

⁴⁵ Pilcher, et al., “Brief but Efficient.”

⁴⁶ Abu-Raddad et al., “Genital Herpes”; Brenner et al., “High Rates of Forward Transmission”; Pao et al., “Transmission of HIV-1”; Yerly et al., “Acute HIV Infection”; Lewis et al., “Episodic Sexual Transmission.”

⁴⁷ MacKellar et al., “Unrecognized HIV Infection.”

⁴⁸ Levi et al., “Characteristics of Clients.”

⁴⁹ Pisani et al., “Back to Basics in HIV Prevention.”

⁵⁰ Pisani et al., “Back to Basics in HIV Prevention”; Ainsworth and Teokul, “Breaking the Silence.”

⁵¹ Ainsworth and Teokul, “Breaking the Silence.”

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Appendix A

Table A.1 Estimated Number of People Living with HIV in MENA Countries

Country	Number of PLHIV
Afghanistan	Not available
Algeria	21,000 (11,000–43,000)
Bahrain	Not available
Djibouti	16,000 (12,000–19,000)
Egypt, Arab Rep. of	9,200 (7,200–13,000)
Iran, Islamic Rep. of	86,000 (68,000–110,000)
Iraq	Not available
Jordan	Not available
Kuwait	Not available
Lebanon	3,000 (1,700–7,200)
Libya	Not available
Morocco	21,000 (15,000–31,000)
Oman	Not available
Pakistan	96,000 (69,000–150,000)
Qatar	Not available
Saudi Arabia	Not available
Somalia	24,000 (13,000–45,000)
Sudan	320,000 (220,000–440,000)
Syrian Arab Republic	Not available
Tunisia	3,700 (2,700–5,400)
United Arab Emirates	Not available
West Bank and Gaza	Not available
Yemen, Rep. of	Not available

Source: UNAIDS Country Database 2008, <http://www.unaids.org/en/CountryResponses/Countries/default.asp>.
 Note: PLHIV = people living with HIV. Numbers within parentheses indicate the range within which the estimate could lie.

Appendix B

Table B.1 shows key differences in the epidemiologic characteristics of several sexually transmitted infections (STIs). These characteristics play a leading role in determining the nature of the infectious spread of these STIs. The effective sexual partner acquisition rate determines the size of the population where the STI transmission chains are sustainable (group of sustainable transmission, GST).¹ The size of the GST in any community determines the potential size of the STI epidemic. Different STIs have different GST sizes.

CRITERIA FOR SCIENTIFIC LITERATURE REVIEW

We used the following criteria for the scientific literature searches in peer-reviewed publications using the Medline (PubMed) database:

1. Studies of HIV infectious spread in its different transmission modes under the strategy of “HIV Seropositivity” OR “HIV” OR “HIV Infections” AND “Middle East” OR “Islam”

Table B.1 Threshold for Sustainable Transmission and Transmission Probability per Partnership for Key STIs

STI	Duration of infectiousness in years	Transmission probability per partnership			Effective mean rate of new sexual partner acquisition per year for sustainable transmission
		1-Year partnership	10-Year partnership	20-Year partnership	
Gonorrhea ^a	0.5	0.50	0.50	0.50	4
Chlamydia ^b	1.25	0.20	0.20	0.20	4
Syphilis ^c	0.5	0.30	0.30	0.30	7
Chancroid ^d	0.08	0.80	0.80	0.80	15
Herpes simplex virus type 2 ^e	Chronic reactivations for lifetime	0.20	0.89	0.99	0.4
Human papillomavirus ^f	Chronic	~1.00	~1.00	~1.00	<0.1
human immunodeficiency virus-1 ^g	10	0.16	0.83	0.83	1.4

^a Brunham and Plummer 1990; Yorke, Hethcote, and Nold 1978.

^b Brunham and Plummer 1990; Lycke et al. 1980.

^c Brunham and Plummer 1990; Schroeter et al. 1971.

^d Brunham and Plummer 1990; Plummer et al. 1983.

^e Abu-Raddad et al. 2008.

^f Winer et al. 2003.

^g Abu-Raddad et al. 2008.

¹ Abu-Raddad et al., “Genital Herpes”; Boily and Masse, “Mathematical Models”; Brunham and Plummer, “A General Model.”

- OR “Arabs” OR “Arab World” OR “Africa, Northern” OR “Mauritania” OR “Sudan” OR “Somalia” OR “Djibouti” OR “Pakistan.” As of July 30, 2009, 1,036 publications were identified, covering studies from the early days of the HIV epidemic in MENA up to today. The number of studies has increased substantially in the last few years.
2. Studies of sexual behavior and levels of risk behavior under the strategy of “Sexual Behavior” OR “Sexual Partners” OR “Sexual Abstinence” OR “Unsafe Sex” OR “Sexology” OR “Reproductive Behavior” OR “Safe Sex” OR “Condoms” OR “Sex” AND “Middle East” OR “Islam” OR “Arabs” OR “Arab World” OR “Africa, Northern” OR “Mauritania” OR “Sudan” OR “Somalia” OR “Djibouti” OR “Pakistan.” As of July 30, 2009, 1,393 publications were identified, covering diverse issues in sexual and reproductive behavior. Most of these articles are focused on demographic and reproductive issues such as fertility, but still hundreds of articles study or discuss sexual behavior in MENA.
 3. Studies of herpes simplex virus type 2 seroprevalence under the strategy of “Herpesvirus 2, Human” OR “Herpes Genitalis” AND “Middle East” OR “Islam” OR “Arabs” OR “Arab World” OR “Africa, Northern” OR “Mauritania” OR “Sudan” OR “Somalia” OR “Djibouti” OR “Pakistan.” As of July 30, 2009, 27 publications were identified.
 4. Studies of human papillomavirus and cervical cancer under the strategy of “HPV” OR “Human Papillomavirus” OR “Human Papilloma Virus” OR “Cervical Cancer” AND “Middle East” OR “Islam” OR “Arabs” OR “Arab World” OR “Africa, Northern” OR “Mauritania” OR “Sudan” OR “Somalia” OR “Djibouti” OR “Pakistan.” As of July 30, 2009, 188 publications were identified.
 5. Studies of bacterial STIs under the strategy of “Chlamydia” OR “Chlamydia Infections” OR “Chlamydia Trachomatis” OR “Gonorrhea” OR “Neisseria Gonorrhoeae” OR “Syphilis” OR “Vaginosis, Bacterial” OR “Pelvic Inflammatory Disease” AND “Middle East” OR “Arabs” OR “Islam” OR “Arab World” OR “Africa, Northern” OR “Mauritania” OR “Sudan” OR “Somalia” OR “Djibouti” OR “Pakistan”. As of July 30, 2009, 523 publications were identified.
 6. Studies of hepatitis C virus under the strategy of “Hepatitis C” OR “Hepatitis C Antibodies” OR “Hepatitis C Antigens” AND “Middle East” OR “Islam” OR “Iran” OR “Arabs” OR “Arab World” OR “Africa, Northern” OR “Mauritania” OR “Sudan” OR “Somalia” OR “Djibouti” OR “Pakistan”. As of July 30, 2009, 788 publications were identified.

Appendix C

Table C.1 summarizes the results of HIV point-prevalence surveys in different population groups within the general population in MENA, in addition to the data shown in chapter 6.

Table C.1 HIV Prevalence of Different Population Groups in MENA

Country	HIV prevalence among different population groups
Bahrain	0.0% (outpatient pediatric clinic; Al-Mahroos and Ebrahim 1995)
Djibouti	0.0% (women; Marcelin et al. 2001) 5.0% (women; Marcelin et al. 2002) 5.0% (men; Marcelin et al. 2002)
Egypt, Arab Republic of	0.0% (different population groups; Constantine et al. 1990) 0.0% (tourism workers; El-Sayed et al. 1996) 0.18% (fever patients; Watts et al. 1993) 1.9% (sexual contacts of HIV patients; Watts et al. 1993) 0.07% (international travelers; Watts et al. 1993) 0.97% (non-Egyptian residents; Watts et al. 1993) 0.0% (hospital patients; El-Ghazzawi, Hunsmann, and Schneider 1987) 0.0% (control group in a study; El-Ghazzawi et al. 1995) 0.0% (fire brigade personnel; Quinti et al. 1995; Renganathan et al. 1995) 0.0% (university students; El-Gilany and El-Fedawy 2006)
Iran, Islamic Republic of	0.34% (healthy children; Karimi and Ghavanini 2001) 1.8% (gypsy population; Hosseini Asl, Avijgan, and Mohamadnejad 2004) 0.0% (runaways and other women seeking safe haven; Hajiabdolbaghi et al. 2007)
Jordan	0.0% (public employees; Zamani et al. 2005; Razzaghi et al. 2006; Ministry of Health and Medical Education of Iran 2006; Afshar [date unknown(a)]; Afshar and Kasrace 2005; WHO/EMRO 2004) 0.0% (military personnel; Jordan National AIDS Program, personal communication) 0.0% (prisoners; Jordan National AIDS Program, personal communication) 0.64% (at-risk populations; Anonymous 2006)
Mauritania	0.28% (general population; Baidy et al. 1993)
Morocco	0.0% (newly recruited employees; Morocco MOH 2007) 0.0% (people seeking a health insurance card; Morocco MOH 2007) 0.0% (traditional barbers and their customers; Zahraoui-Mehadji et al. 2004) 0.10% (STD clinic attendees, pregnant women, and patients with pulmonary tuberculosis; Elharti et al. 2002) 0.0% (women at family planning clinics; WHO/EMRO Regional Database on HIV/AIDS) 0.32% (seasonal female laborers; Khattabi and Alami 2005) 0.72% (seasonal female laborers; Bennani and Alami 2006) 0.75% (seasonal female laborers; Morocco MOH 2007) 5.26% (male laborers; Khattabi and Alami 2005) 0.0% (male laborers; Bennani and Alami 2006) 0.0% (hotel staff; Khattabi and Alami 2005) 0.16% (hotel staff; Bennani and Alami 2006) 0.12% (hotel staff; Morocco MOH 2007)

Table C.1 (Continued)

Country	HIV prevalence among different population groups
Pakistan	0.23% (15,000 individuals with various characteristics including people suspected of living with HIV; Kayani et al. 1994) 0.06% (STD attendees, IDUs, hemodialysis patients, suspected people living with HIV, blood donors, ANC attendees, TB patients, travelers abroad, and multitransfused patients; Iqbal and Rehan 1996) 0.064% (general population; Hyder and Khan 1998) 5.4% (men reporting extramarital contacts; Hyder and Khan 1998) 0.0% (health care workers; Aziz et al. 2002) 0.97% (blood donors and recipients, IDUs, and suspected AIDS cases; Khanani et al. 1990) 0.06% (blood donors and deported Pakistanis from Persian Gulf countries; Tariq et al. 1993) 0.0% (IDUs in rehabilitation centers and drug-related arrestees; Khawaja et al. 1997) 0.1% (high-risk and low-risk populations; Raziq, Alam, and Ali 1993) 0.007% (general population; Khattak et al. 2002) 0.0% (two surveys; earthquake victims; Khan et al. 2008)
Saudi Arabia	0% (controls in a study; Bakir et al. 1995)
Somalia	0.0% (military cadets; Corwin et al. 1991) 0.0% (blood donors and hospitalized children and adults; Nur et al. 2000) 0.0% (women and neonates; Jama et al. 1987) 0.0% (hospitalized persons; Scott et al. 1991) 1.0% (hospitalized persons; Kulane et al. 2000)
Sudan	1.1% (general population; Southern Sudan; Arbesser, Mose, and Sixl 1987) 2.7% (general population; Southern Sudan; NSNAC and UNAIDS 2006) 4.3% (women; Southern Sudan; NSNAC and UNAIDS 2006) 1.0% (general population; Malakal, Southern Sudan; IGAD 2006) 7.2% (general population; Yambio, Southern Sudan; IGAD 2006) 12.0% (tea sellers; Southern Sudan; NSNAC and UNAIDS 2006) 3.0% (female outpatients; Southern Sudan; McCarthy, Khalid, and El Tigani 1995) 3.0% (outpatients; Juba; Southern Sudan; UNAIDS 2007b ; UNAIDS 2007a) 4.0% (outpatients; Juba; Southern Sudan; UNAIDS 2007b; UNAIDS 2007a) 0.8% (pregnant women and STI patients; Komo and Ardi Kanan; Southern Sudan; NSNAC and UNAIDS 2006) 1.1% (university students; North Sudan; Ahmed 2004i), 1.2% (women in a suburban community in Khartoum; North Sudan; Kafi, Mohamed, and Musa 2000) 2.5% (tea sellers; North Sudan; UNAIDS 2008; Ahmed 2004j) 0.4% (tea sellers; North Sudan; Anonymous 2007) 0.2% (patients with various malignancies and normal subjects; North Sudan; Fahal et al. 1995) 0.12% (hospital attendees; North Sudan; Ati 2005) 1.0% (police officers in Khartoum; North Sudan; Abdelwahab 2006)
Turkey	0.1% (engaged couples; Alim et al. 2009)
Yemen, Republic of	0.0%, 0.17%, 1.26%, and 1.19% (travelers seeking visas to work abroad in different years, respectively; WHO, UNICEF, and UNAIDS 2006s)

Note: ANC = antenatal clinic; IDU = injecting drug use/user; STD = sexually transmitted disease; TB = tuberculosis.

Appendix D

Table D.1 HIV Prevalence among STD Clinic Attendees, VCT Attendees, and People Suspected of Living with HIV

Country	HIV prevalence among STD clinic attendees, VCT attendees, and people suspected of living with HIV
Algeria	2.0% (Institut de Formation Paramédicale de Parnet 2004) 1.24% (Unknown, "Statut de la réponse nationale") 1.26% (Unknown, "Statut de la réponse nationale") 0.25% (Alami 2009) 1.19% (Alami 2009) 2.4% (Alami 2009)
Djibouti	1.0% (Fox et al. 1989) 10.4% (Rodier et al. 1993)
Egypt, Arab Republic of	0.0% (Saleh et al. 2000) 0.23% (Watts et al. 1993) 8.4% (Ali et al. 1998)
Iran, Islamic Republic of	4.1% (Ghannad et al. 2009) 2.0% (Ghannad et al. 2009) 2.2% (Ghannad et al. 2009)
Kuwait	0.0% (Al-Owaish et al. 2000) 0.0% (Al-Fouzan and Al-Mutairi 2004) 0.0% (Al-Mutairi et al. 2007)
Morocco	0.15% (Khattabi and Alami 2005) 0.08% (Khattabi and Alami 2005) 0.25% (Khattabi and Alami 2005) 0.16% (Khattabi and Alami 2005) 0.1 (women; Ryan et al. 1998) 0.3% (women; Ryan et al. 1998) 2.9% (Ryan et al. 1998) 0.0% (men; WHO/EMRO Regional Database on HIV/AIDS) 0.2% (women; WHO/EMRO Regional Database on HIV/AIDS) 0.09% (Khattabi and Alami 2005) 0.23% (Khattabi and Alami 2005) 0.62% (Heikel et al. 1999) 5.0% (attendees with high risk and/or symptoms; Elmir et al. 2002) 0.10% (Khattabi and Alami 2005; Elharti et al. 2002) 0.25% (Elharti et al. 2002) 0.34% (Khattabi and Alami 2005) 0.26% (Khattabi and Alami 2005) 0.19% (Morocco MOH 2007)

Table D.1 (Continued)

Country	HIV prevalence among STD clinic attendees, VCT attendees, and people suspected of living with HIV
Pakistan	0.0% (Iqbal and Rehan 1996) 0.0% (Mujeeb and Hafeez 1993) 0.3% (Shrestha 1996) 6.1% (Shrestha 1996) 0.22% (Rehan 2006)
Somalia	0.0% (Corwin et al. 1991) 0.0% (Burans et al. 1990) 0.0% (Scott et al. 1991) 0.9% (UNAIDS 2006) 4.3% (WHO 2004) 5.5% (UNAIDS 2006) 6.3% (Somaliland Ministry of Health and Labour 2007) 12.3% (Somaliland Ministry of Health and Labour 2007) 7.4% (men; Somaliland Ministry of Health and Labour 2007) 5.4% (women; Somaliland Ministry of Health and Labour 2007) 1.7% (refugees; UNHCR 2006–07a) 0.9% (refugees; UNHCR 2006–07a) 2.0% (refugees; UNHCR 2006–07a) 1.0% (refugees; UNHCR 2006–07a) 2.0% (refugees; UNHCR 2006–07a) 0.3% (refugees; UNHCR 2006–07a) 0.0% (refugees; UNHCR 2006–07a) 2.3% (refugees; UNHCR 2006–07a) 1.9% (refugees; UNHCR 2006–07a)
Sudan	5.8% (Southern Sudan; NSNAC and UNAIDS 2006) 5.8% (Yei town, Southern Sudan; SNAP, NSNAC, and UNAIDS 2006) 17.0% (VCT; Southern Sudan; SNAP, NSNAC, and UNAIDS 2006) 19.1% (VCT; Southern Sudan; NSNAC and UNAIDS 2006) 16.1% (VCT; Southern Sudan; NSNAC and UNAIDS 2006) 20.0% (VCT; Southern Sudan; UNHCR 2007) 2.0% (VCT; Southern Sudan; UNHCR 2007) 5.0% (VCT; Southern Sudan; UNHCR 2007) 6.2% (VCT; Southern Sudan; UNHCR 2007) 1.1% (North Sudan; Ahmed 2004g) 1.94% (North Sudan; SNAP 2008) 1.47% (North Sudan; SNAP 2008) 2.0% (North Sudan; Sudan MOH 2005) 1.86% (Red Sea; North Sudan; Sudan National AIDS Control Program 2005) 2.0% (Khartoum; North Sudan; Sudan National AIDS Control Program 2005; Sudan MOH 2005) 0%–4.4% (three Khartoum sites; North Sudan; SNAP and UNAIDS 2006) 2.0% (Khartoum; North Sudan; SNAP and UNAIDS 2006) 1.86% (Red Sea; North Sudan; SNAP and UNAIDS 2006) 0.0% (Khartoum; North Sudan; SNAP and UNAIDS 2006) 0.0% (Khartoum; North Sudan; SNAP and UNAIDS 2006) 4.4% (Khartoum; North Sudan; SNAP and UNAIDS 2006) 26.0% (suspected AIDS patients; North Sudan; Ahmed 2004a) 3.1% (refugees; UNHCR 2006–07b)
Tunisia	1.8% (Sellami et al. 2003)
Yemen, Republic of	1.8% (Al-Serouri 2005; WHO, UNICEF, and UNAIDS 2006s)

Table D.2 HIV Prevalence of Tuberculosis (TB) Patients

Country	HIV prevalence among tuberculosis patients
Afghanistan	0.2% (Todd et al. 2007)
Algeria	0.2% (Unknown, "Rapport de l'enquête nationale de séro-surveillance") 0.3% (Unknown, "Rapport de l'enquête nationale de séro-surveillance")
Djibouti	5.7% (Rodier et al. 1993) 44.4% (estimate; WHO 2005) 10.1% (estimate; Djibouti National TB Programme 2006)
Iran, Islamic Republic of	1.8% (WHO/EMRO 2007) 3.0% (hospital attendees; Tabarsi et al. 2008)
Iraq	0.0% (Abdul-Abbas, al-Delami, and Yousif 2000) 0.0% (estimate; Iraq National TB Programme 2006)
Jordan	0.0% (Jordan National TB Programme 2006)
Kuwait	0.3% (Kuwait National TB Programme 2006)
Lebanon	0.5% (estimate; Lebanon National TB Programme 2006)
Mauritania	1.5% (WHO 2002)
Morocco	0.36% (WHO/EMRO 2007; Elharti et al. 2002) 0.12% (Khattabi and Alami 2005) 0.4% (Khattabi and Alami 2005) 0.94% (Khattabi and Alami 2005) 0.14% (Khattabi and Alami 2005) 0.5% (Khattabi and Alami 2005) 0.19% (Khattabi and Alami 2005) 0.34% (Khattabi and Alami 2005) 1.6% (Alami 2009) 0.39% (Bennani and Alami 2006) 0.76% (Morocco MOH 2007)
Oman	2.0 (WHO/EMRO 2007)
Pakistan	1.8% (Hussain et al. 2004)
Qatar	0.0% (Qatar National TB Programme 2006)
Saudi Arabia	1.1% (Alrajhi et al. 2002)
Somalia	0.0% (Corwin et al. 1991) 0.0% (Scott et al. 1991) 1.6% (Kulane et al. 2000) 6.0% (UNAIDS 2006)] 2.4% (UNAIDS 2006) 4.5% (WHO 2004) 5.6% (UNAIDS 2006)
Sudan	1.6% (SNAP 2006) 7.2% (Sudan National AIDS Control Program 1999) 4.9% (settled population; El-Sony et al. 2002) 2.6% (IDPs; El-Sony et al. 2002) 4.0% (El-Sony et al. 2002) 2.0% (Ahmed 2004i) 1.85% (SNAP and UNAIDS 2006) 4.8% (Southern Sudan origin; El-Sony et al. 2002) 0.0% (Red Sea; North Sudan; Sudan National AIDS Control Program 2005) 3.0% (Algardarif; North Sudan; Sudan National AIDS Control Program 2005) 1.6% (White Nile; North Sudan; Sudan Government of National Unity 2007) 2.0% (White Nile; North Sudan; Sudan National AIDS Control Program 2005; SNAP and UNAIDS 2006) 1.3% (South Darfur; North Sudan; Sudan National AIDS Control Program 2005)

Table D.2 (Continued)

Country	HIV prevalence among tuberculosis patients
	3.6% (North Kordofan; North Sudan; Sudan National AIDS Control Program 2005) 5.1% (North Kordofan; North Sudan; SNAP and UNAIDS 2006) 0.33% (Kassala; North Sudan; SNAP and UNAIDS 2006) 2.8% (Khartoum; North Sudan; Sudan National AIDS Control Program 2005) 1.89%–5.65% (four Khartoum sites; North Sudan; SNAP and UNAIDS 2006) 3.6% (North Sudan origin; El-Sony et al. 2002)
Tunisia	0.0% (Jemni et al. 1991)
Yemen, Republic of	3.3% (WHO/EMRO 2007) 2.1% (Al-Serouri 2005; WHO, UNICEF, and UNAIDS 2006s) 6.9% (Al-Serouri 2005; WHO, UNICEF, and UNAIDS 2006s) 1.9% (Al-Serouri 2005; WHO, UNICEF, and UNAIDS 2006s) 0.7% (Yemen National TB Programme 2006)

Table D.3 Point-Prevalence Surveys on Different Population Groups

Country	Injecting drug users	Men who have sex with men	Female sex workers	STI clinic patients	Tuberculosis patients	Pregnant women
Algeria ^a			3.0% (2000)	0.0% (1998) 0.4% (2000)	0.2% (2000)	1% (2000)
Bahrain ^b	21.1% (1991) 0.9% (1998) 1.4% (1993) 1.6% (1994) 0.0% (1995) 1.1% (1996) 0.0% (1997) 0.0% (1999)			0.0% (1998) 0.0% (1990) 0.0% (1993) 0.0% (1994) 0.2% (1995) 0.0% (1996) 0.0% (1997)	2.9% (1994) 0.0% (1995) 0.8% (1996) 0.7% (1997) 0.7% (1998)	0.2% (1998) 0.0% (1993) 0.0% (1994) 0.0% (1995) 0.2% (1996) 0.2% (1997)
Djibouti ^c			19.5% (1990) 26% (1991) 36.6% (1992) 37.7% (1993) 26.3% (1993) 25.5% (1994) 36.8% (1995) 32.6% (1996) 32.7% (1997) 27.5% (1998)	1.9% (1990) 10.4% (1991) 11.6% (1992) 14.4% (1993) 16.3% (1993) 19.9% (1994) 19.5% (1995) 22.2% (1996)	5.9% (1991) 6.2% (1992) 7.4% (1993) 15% (1996) 44% (2000) 8.7% (1994) 12.8% (1995) 14.9% (1996) 16.7% (1997) 17.2% (1998) 13% (1999) 24% (2000) 23% (2001)	0.5% (1991) 1.6% (1992) 4% (1993) 2.5% (2002) 3.4% (1993) 2.8% (1994) 9.3% (1995) 2.9% (1996) 1.9% (2000)
Egypt, Arab Republic of ^d	2.8% (1992) 3.8% (1994) 0.0% (1996) 0.0% (1993) 0.0% (1994) 0.0% (1995) 0.0% (1996) 0.0% (1997) 0.0% (1998)	0.0% (1991) 0.7% (1992) 0.0% (1993) 0.0% (1994) 0.0% (1995) 0.0% (1996) 0.0% (1997) 1.3% (1998) 1.4% (1999)	0.0% (1991) 0.0% (1993) 0.0% (1992) 0.0% (1993) 0.0% (1994) 0.0% (1995) 0.9% (1996) 1.1% (1997) 1.5% (1998)	0.8% (1990) 0.0% (1991) 0.0% (1992) 0.2% (1993) 0.0% (1994) 0.0% (1995) 0.0% (1996) 0.0% (1997) 0.0% (1998)	0.0% (1991) 0.0% (1992) 0.2% (1993) 0.3% (1994) 0.0% (1995) 0.1% (1996) 0.0% (1997) 0.3% (1998) 0.2% (1999)	0.0% (1991) 0.0% (1992) 0.0% (1993) 0.0% (1994) 0.0% (1995) 0.0% (1993) 0.0% (1994) 0.0% (1995) 0.0% (1996)

(continued)

Table D.3 (Continued)

Country	Injecting drug users	Men who have sex with men	Female sex workers	STI clinic patients	Tuberculosis patients	Pregnant women
	0.0% (1999) 0.0% (2004)	0.8% (2000) 1% (2001) 0.0% (2004)	1.1% (1999) 0.0% (2000) 0% (2001) 0.0% (2004)	0.0% (1999) 0.0% (2000) 0.0% (2001) 0.0% (1992) 0.0% (1993) 0.0% (1994) 0.0% (1995) 0.0% (1996) 0.0% (1997) 0.0% (1998) 0.0% (1999) 0.0% (2002) 0.0% (2004)	0.3% (2000) 0.2% (2001) 0.0% (1991) 0.0% (1992) 0.0% (1993) 0.1% (1994) 0.0% (1995) 0.1% (1996) 0.0% (1997) 0.7% (1998) 0.5% (1999) 0.6% (2001) 0.1% (2004)	0.0% (2004)
Iran, Islamic Republic of	5.7% (1996) 1.8% (1997) 0.5% (1998)		0.0% (1993) 0.0% (1994) 0.0% (1995) 0.0% (1996) 0.0% (1997) 0.0% (1998)	0.0% (1992) 0.1% (1993) 0.0% (1994) 0.0% (1992) 0.0% (1993) 0.0% (1994) 0.0% (1995) 0.0% (1996) 0.0% (1997) 0.0% (1998)	0.0% (1995) 0.0% (1997) 0.0% (1998) 6.5% (2000) 4.2% (2001)	0.0% (1993) 0.0% (1992) 0.0% (1994)
Iraq ^e	0.0% (1993) 0.0% (1994) 0.0% (1995) 0.0% (1996) 0.0% (1997) 0.0% (1998) 0.0% (1999)	0.0% (1993) 0.0% (1994) 0.0% (1995) 0.0% (1996) 0.0% (1997) 0.0% (1998)	0.0% (1993) 0.0% (1994) 0.0% (1995) 0.1% (1996) 0.0% (1997)	0.0% (1993) 0.0% (1994) 0.0% (1995) 0.0% (1996) 0.0% (1997) 0.0% (1998) 0.0% (1999)	0.0% (1997) 0.0% (1993) 0.0% (1994) 0.0% (1995) 0.0% (1996) 0.0% (1997) 0.0% (1998) 0.0% (1999)	0.0% (1993) 0.0% (1996) 0.0% (1997) 0.0% (1998) 0.0% (1999)
Jordan ^g			1.3% (1991)	1% (1992) 0.0% (1993) 0.0% (1994) 0.0% (1995)	0.0% (2001)	0.0% (1992) 0.0% (1993) 0.0% (1994) 0.0% (1999)
Kuwait ^h	1% (1993) 0.0% (1994) 0.0% (1995) 0.6% (1996) 0.0% (1997) 0.0% (1998) 0.0% (1999)			0.0% (1997) 0.0% (1993) 0.0% (1994) 0.0% (1995) 0.0% (1996) 0.0% (1997) 0.0% (1998) 0.0% (1999)		0.0% (1995) 0.0% (1996) 0.0% (1997) 0.0% (1998) 0.0% (1993) 0.0% (1994) 0.0% (1995) 0.0% (1996) 0.0% (1997) 0.0% (1998) 0.0% (1999)
Lebanon ⁱ			0.3% (1992) 0.1% (1993) 0.1% (1994) 0.0% (1995)	1.1% (1994)		0.1% (1994) 0.0% (1995)
Libya ^j	0.5% (1998)		1.1% (1993) 1.2% (1994)	0.0% (1990)	0.3% (1998)	0.0% (1998)

Table D.3 (Continued)

Country	Injecting drug users	Men who have sex with men	Female sex workers	STI clinic patients	Tuberculosis patients	Pregnant women
Morocco ^k				0.0% (1993)	0.0% (1996)	0.0% (1994)
				0.0% (1994)	0.0% (1997)	0.0% (1996)
				0.0% (1996)	2% (1999)	0.0% (1997)
				0.9% (1997)	0.0% (1996)	0.1% (1999)
				0.4% (1999)	0.0% (1997)	0.0% (1996)
				0.0% (1996)	0.6% (1999)	0.0% (1997)
				0.0% (1997)		0.0% (1999)
				0.0% (1999)		
Oman ^l				0.0% (1999)	4.2% (1996)	
					2.3% (1997)	
					1.9% (1998)	
					1.4% (1999)	
Pakistan ^m	1.1% (1996)	1.6% (1993)	0.0% (1995)	6.1% (1994)	0.0% (1994)	0.0% (1993)
	0.0% (2000)	0.3% (1995)	1.2% (1993)	0.3% (1995)	2.8% (1995)	0.0% (1995)
	0.0% (2001)		0.7% (1995)	0.5% (2001)	0.0% (1992)	0.0% (2001)
	0.3% (1993)		0.0% (1996)	4.2% (1992)	0.0% (1993)	0.0% (1992)
	0.0% (1994)		0.5% (1997)	0.8% (1993)	0.1% (1994)	0.0% (1993)
	5.4% (1995)		1.7% (2001)	6.1% (1994)	0.8% (1995)	0.0% (1994)
				0.7% (1995)	1% (1997)	0.1% (1995)
				1.5% (1996)	0.2% (1998)	0.0% (1996)
				0.1% (1997)	0.0% (1999)	0.2% (1997)
				0.0% (1998)	2.1% (2001)	0.0% (1998)
				0.0% (1999)		0.0% (1999)
Qatar ⁿ				4.5% (1999)	0.0% (1993)	
					0.8% (1996)	
Somalia ^o			2.4% (1990)	0.0% (1990)	1.6% (1998)	0.0% (1998)
				4% (2004)	2.4% (2004)	0.9% (2004)
				4% (2005)	2% (2005)	1% (2005)
				0.9% (1999)	6% (1999)	2% (1997)
				4.3% (2002)	4.5% (2002)	0.6% (1997)
				5.5% (2004)	5.6% (2004)	0.8% (2004)
						0.0% (2005)
Sudan ^p			4.4% (2002)	1.8% (2004)	17% (1995)	4.5% (1996)
				6.8% (1991)	75% (1998)	0.5% (1998)
				2% (1993)	2.8% (2004)	0.3% (2004)
				3.6% (1994)	6.8% (1993)	0.0% (1994)
				3.2% (1997)	14.2% (1994)	1.8% (1995)
				1.1% (2002)	2.8% (1995)	1.7% (1996)
				1.9% (2004)	2.1% (1996)	2.9% (1997)
					9.9% (1997)	3.8% (1998)
					7.2% (1999)	0.9% (2002)
					1.4% (2004)	0.8% (2004)
Syrian Arab Republic ^q	0.1% (1992)	0.0% (1992)	0.0% (1990)	0.1% (1995)	0.0% (1995)	0.0% (1993)
	0.0% (1993)	0.6% (1994)	0.0% (1991)	0.3% (1996)		
	0.2% (1994)	3.6% (1995)	0.0% (1992)	0.2% (1997)		
	0.0% (1995)	0.9% (1996)	0.0% (1993)	0.1% (1998)		
	0.0% (1996)	0.0% (1997)	0.0% (1994)	0.0% (1990)		
	0.0% (1997)	0.6% (1998)	0.0% (1995)	0.2% (1993)		
	0.0% (1998)	0.0% (1999)	0.0% (1996)	1% (1994)		

(continued)

Table D.3 (Continued)

Country	Injecting drug users	Men who have sex with men	Female sex workers	STI clinic patients	Tuberculosis patients	Pregnant women
	0.0% (1999)		0.0% (1997) 0.1% (1998) 0.0% (1999)	0.2% (1995) 0.0% (1996) 0.0% (1997) 0.1% (1998) 0.0% (1999)		
Tunisia ^f	1.1% (1993) 0.9% (1994) 0.7% (1995) 1% (1996) 0.3% (1997)		0.0% (1990) 0.3% (1993) 0.1% (1994) 0.0% (1995) 0.4% (1996) 0.1% (1997) 0.0% (1998) 0.0% (1999)	0.0% (1995)	0.7% (1990) 0.4% (1993) 0.3% (1994) 0.0% (1995) 0.3% (1996) 0.0% (1998)	0.0% (1991) 0.2% (1996) 0.2% (1997) 0.2% (1998) 0.2% (1999) 0.2% (2000) 0.0% (1999)
Yemen, Republic of ^g			4.5% (1998)	1.7% (1993) 5.3% (1997) 2.9% (1998)	2.1% (1996) 0.5% (1998)	

Note: This table is a summary of all point-prevalence surveys as extracted from UNAIDS epidemiological facts sheets on each MENA country over the years. STI = sexually transmitted infection.

^a WHO, UNICEF, and UNAIDS 2006a.

^b WHO, UNICEF, and UNAIDS 2006b.

^c WHO, UNICEF, and UNAIDS 2006c.

^d WHO, UNICEF, and UNAIDS 2006d.

^e WHO, UNICEF, and UNAIDS 2006e.

^f WHO, UNICEF, and UNAIDS 2006f.

^g WHO, UNICEF, and UNAIDS 2006g.

^h WHO, UNICEF, and UNAIDS 2006h.

ⁱ WHO, UNICEF, and UNAIDS 2006i.

^j WHO, UNICEF, and UNAIDS 2006j.

^k WHO, UNICEF, and UNAIDS 2006k.

^l WHO, UNICEF, and UNAIDS 2006l.

^m WHO, UNICEF, and UNAIDS 2006m.

ⁿ WHO, UNICEF, and UNAIDS 2006n.

^o WHO, UNICEF, and UNAIDS 2006o.

^p WHO, UNICEF, and UNAIDS 2006p.

^q WHO, UNICEF, and UNAIDS 2006q.

^r WHO, UNICEF, and UNAIDS 2006r.

^s WHO, UNICEF, and UNAIDS 2006s.

Table D.4 Hepatitis C Virus Prevalence in Different Population Groups

Country	Hepatitis C virus prevalence in different population groups
Afghanistan	0.31% (ANC attendees; Todd et al. 2008) 0.3% (blood donors; Dupire et al. 1999) 1.9% (blood donors; Afghanistan Central Blood Bank 2006) 36.6% (IDUs; Todd et al. 2007)
Algeria	0.18% (blood donors; Ayed et al. 1995) 0.19% (pregnant women; Ayed et al. 1995) 0.63% (pregnant women; Aidaoui, Bouzbid, and Laouar 2008)
Bahrain	0.3% (blood donors including Saudi subjects; Almawi et al. 2004) 9.24% (dialysis patients including Saudi patients; Almawi et al. 2004) 40.0% (children with hemolytic anemias; Al-Mahroos and Ebrahim 1995)
Djibouti	0.3% (blood donors; Dray et al. 2005)
Egypt, Arab Republic of	13.9% (healthy populations; meta-analyses; Lehman and Wilson 2009), 78.5% (hepatocellular carcinoma patients; meta-analyses; Lehman and Wilson 2009) 13.6% (blood donors; Darwish et al. 1993) 26.6% (blood donors; Bassily et al. 1995)

Table D.4 (Continued)

Country	Hepatitis C virus prevalence in different population groups
	14.5% (blood donors; El Gohary et al. 1995)
	2.7% (blood donors; El-Gilany and El-Fedawy 2006)
	8.8% (blood donors; Tanaka et al. 2004)
	24.8% (blood donors; Arthur et al. 1997)
	20.8% (blood donors; Quinti et al. 1995)
	10.0% (general population; Shemer-Avni et al. 1998)
	27.5% (general population; El-Ghazzawi et al. 1995)
	24.0% (rural population; Mohamed et al. 2005)
	9.0% (rural population; Mohamed et al. 2005)
	14.8% (rural population; Marzouk et al. 2007)
	18.5% (rural population; Mohamed et al. 2006)
	2.7% (rural population; Arafa et al. 2005)
	19.0% (rural population; 10–19 years old; Darwish et al. 2001)
	60.0% (rural population; >30 years old; Darwish et al. 2001)
	8.7% (rural population; Nafeh et al. 2000)
	14.4% (rural population; El Gohary et al. 1995)
	15.5% (rural population; El Gohary et al. 1995)
	24.3% (rural population; Abdel-Aziz et al. 2000)
	10.3% (rural population; El-Sayed et al. 1997)
	18.1% (rural population; Abdel-Wahab et al. 1994)
	13.0% (healthy women; Kumar, Frossad, and Hughes 1997)
	15.7% (pregnant women; rural area; Shebl et al. 2009)
	19.0% (pregnant women; Kassem et al. 2000)
	15.8% (pregnant women; Stoszek et al. 2006)
	2.02% (children; El-Raziky et al. 2007)
	12.0% (children; Quinti et al. 1995; El-Nanawy et al. 1995)
	12.1% (children; Abdel-Wahab et al. 1994)
	31.5% (applicants for visa abroad; Mohamed et al. 1996a)
	39.0% (fire brigade personnel; Quinti et al. 1995)
	22.1% (army recruits; Abdel-Wahab et al. 1994)
	14.3% (tourism workers; El-Sayed et al. 1996)
	31.4% (prisoners; Quinti et al. 1995)
	7.7% (health care workers; El Gohary et al. 1995)
	1.4% (dentists; Hindy, Abdelhaleem, and Aly 1995)
	63.0% (IDUs; Saleh et al. 2000; El-Ghazzawi 1995)
	5.3% (STD patients; Ali et al. 1998)
	23.3% (kidney transplant recipients; Gheith et al. 2007)
	84.0% (hepatocellular carcinoma patients; Mabrouk 1997)
	27.3% (acute jaundice patients; Quinti et al. 1997)
	73.5% (chronic liver disease patients; Waked et al. 1995)
	46.2% (chronic liver disease patients; Abdel-Wahab et al. 1994)
	70.4% (hemodialysis patients; El Gohary et al. 1995)
	87.5% (hemodialysis patients; Gohar et al. 1995)
	46.2% (hemodialysis patients; Abdel-Wahab et al. 1994)
	81.25% (hemodialysis patients; Gohar et al. 1995)
	16.4% (children with hepatosplenomegaly; Abdel-Wahab et al. 1994)
	54.9% (hospitalized and multitransfused children; Abdel-Wahab et al. 1994)
	44.0% (thalassemic children; Quinti et al. 1995; El-Nanawy et al. 1995)
	75.6% (thalassemic children; El Gohary et al. 1995)
	14.0% (family members of HCV positive patients; spouses; Madwar et al. 1999)
	0.0% (family members of HCV positive patients; children; Madwar et al. 1999)
	5–50% (various populations; Mohamed et al. 1996b)

(continued)

Table D.4 (Continued)

Country	Hepatitis C virus prevalence in different population groups
Iran, Islamic Republic of	0.5% (blood donors; Ansar and Kooloobandi 2002)
	0.59% (blood donors; Karimi and Ghavanini 2001; Ghavanini and Sabri 2000)
	0.3% (blood donors; Rezvan et al. 1994)
	0.1% (blood donors; Rahbar, Rooholamini, and Khoshnood 2004)
	0.4% (blood donors; Pourshams et al. 2005)
	0.4% (blood donors; Taziki and Espahbodi 2008)
	0.8% (blood donors; Taziki and Espahbodi 2008)
	2.07% (blood donors; Khedmat et al. 2007)
	0.12% (general population; Alavian, Gholami and Masarrat 2002)
	3.1% (general population; gypsy; Hosseini Asl, Avijgan, and Mohamadnejad 2004)
	12.3% (adult population; Gholamreza et al. 2007)
	0.0% (street children; Vahdani et al. 2006)
	0.59% (healthy children; Karimi and Ghavanini 2001)
	2.7% (FSWs; Jahani et al. 2005)
	52.0% (IDUs; Zamani et al. 2007)
	59.4% (IDUs; Rahbar, Rooholamini, and Khoshnood 2004)
	78.0% (IDUs; local prison; Nassirimanesh 2002)
	47.4% (IDUs; Khani and Vakili 2003)
	45.3% (IDUs; Zali et al. 2001)
	30.0% (injecting and noninjecting drug users; Alizadeh et al. 2005)
	11.2% (IDUs; Imani et al. 2008)
	80.0% (incarcerated IDUs; Kheirandish et al. 2009)
	7.35% (injecting and noninjecting drug users; Mohammad Alizadeh et al. 2003)
	14.4% (noninjecting drug users; Talaie et al. 2007)
	30.0% (prisoners; Alizadeh et al. 2005)
	45.4% (prisoners; Mutter, Grimes, and Labarthe 1994)
	47.0% (prisoners; Khani and Vakili 2003)
	78.0% (prisoners; Nassirimanesh 2002)
	35.8% (prisoners; Javadi, Avijgan, and Hafizi 2006)
	1.33% (household contacts of HCV positive patients; Hajiani et al. 2006)
	12.3% (HBV positive patients; Semnani et al. 2007)
	11.5% (HIV-infected patients; Sharifi-Mood et al. 2006)
	5.5% (hemodialysis patients; Rais-Jalali and Khajehdehi 1999)
	21.0% (hemodialysis patients; Nobakht, Zali, and Nowroozi 2001)
	2.9% (hemodialysis patients; Khamispor and Tahmasebi 1999)
	13.2% (hemodialysis patients; Mohammad et al. 2003)
	24.8% (hemodialysis patients; Amiri, Shakib, and Toorchi 2005)
	55.9% (hemodialysis patients; Ansar and Kooloobandi 2002)
	42.6% (hemodialysis patients; Hosseini-Moghaddam et al. 2006)
	60.2% (hemophiliac patients; Alavian, Ardeshiri, and Hajarizadeh 2001)
	16.0% (hemophiliac patients; Karimi, Yarmohammadi, and Ardeshiri 2002)
51.0% (hemophiliac patients; Torabi et al. 2006)	
48.6% (hemophiliac patients; Javadzadeh, Attar, and Taher Yavari 2006)	
41.9% (hemophiliac patients; Khamispor and Tahmasebi 1999)	
43.4% (hemophiliac patients; Samimi-Rad and Shahbaz 2007)	
29.6% (hemophiliac patients; Sharifi-Mood et al. 2007)	
71.3% (hemophiliac patients; Mansour-Ghanaei et al. 2002)	
15.65% (hemophiliac patients; Karimi and Ghavanini 2001)	
24.2% (thalassemia patients; Alavian, Gholami and Masarrat 2002)	
9.4% (thalassemia patients; Javadzadeh, Attar, and Taher Yavari 2006)	
13.0% (thalassemia patients; Khamispor and Tahmasebi 1999)	
24.0% (thalassemia patients; Nakhaie and Talachian 2003)	
27.2% (thalassemia patients; Kadivar et al., 2001)	
23.0% (thalassemia patients; Basiratnia, HosseiniAsl, and Avijegan 1999)	
25.0% (thalassemia patients; Jafroodi and Asadi 2006)	
21.0% (thalassemia patients; Rezvan, Abolghassemi, and Kafiabad 2007)	

Table D.4 (Continued)

Country	Hepatitis C virus prevalence in different population groups
	63.8% (thalassemia patients; Ansar and Kooloobandi 2002) 18.3% (thalassemia patients; Kashef et al. 2008) 5.1% (thalassemia patients; Samimi-Rad and Shahbaz 2007) 15.7% (thalassemia patients; children; Karimi and Ghavanini 2001) 19.3% (thalassemia patients; Mirmomen et al. 2006) 15.65% (multitransfused hemophiliac patients; Karimi and Ghavanini 2001)
Iraq	3.21% (pregnant women; Al-Kubaisy, Niazi, and Kubba 2002) 66.0% (HIV-infected hemophilia patients; Al-Kubaisy, Al-Naib, and Habib 2006a) 67.3% (children with thalassemia; Al-Kubaisy, Al-Naib, and Habib 2006b)
Jordan	0.65 to 6.25% (hospitalized populations; Quadan 2002) 40.5% (multitransfused patients; Al-Sheyyab, Batieha, and El-Khateeb 2001)
Kuwait	33.0% (thalassemia patients; Al-Fuzae, Aboolbacker, and Al-Saleh 1998) 0.8% (blood donors; Kuwaiti; Ameen et al. 2005) 5.4% (blood donors; non-Kuwaiti; Ameen et al. 2005)
Lebanon	0.4% (blood donors; Tamim et al. 2001) 0.6% (blood donors; Irani-Hakime et al. 2001b) 0.40% (blood donors; Irani-Hakime et al. 2006) 0.7% (blood donors; Araj et al. 1995) 0.7% (general population; Baddoura, Haddad, and Germanos 2002) 2.6% (health care workers; Irani-Hakime et al. 2001a) 25.0% (HIV infected IDUs; Ramia et al. 2004)
Libya	1.19% (national survey; Libya National Center for the Prevention of and Control of Infectious Diseases 2005) 7.9% (healthy subjects; Saleh et al. 1994)
Morocco	1.1% (blood donors; Benjelloun et al. 1996) 1.0% (pregnant women; Benjelloun et al. 1996) 0.5% (ANC attendees and family planning clinic; WHO/EMRO Regional Database on HIV/AIDS) 5.0% (male barbers; Zahraoui-Mehadji et al. 2004) 35.1% (hemodialysis patients; Benjelloun et al. 1996) 76% (hemodialysis patients; Boulaajaj et al. 2005) 68.3% (hemodialysis patients; Sekkat et al. 2008) 42.4% (hemophiliacs; Benjelloun et al. 1996)
Oman	1.5% (blood donors; Alnaqy et al. 2006) 0.9% (blood donors; Al-Dhahry et al. 1993) 26.5% (hemodialysis patients; Al-Dhahry et al. 1993) 13.4% (kidney transplant patients; Al-Dhahry et al. 1993) 0.0% (medical students; Al-Dhahry et al. 1993) 11–53% (IDUs; Unknown 2006)
Pakistan	1.70% (youth; Butt and Amin 2008) 16% (blood donors; Ahmad et al. 2007) 3.6% (blood donors; Abdul Mujeeb et al. 2006) 4.0% (blood donors; Khattak et al. 2002) 0.5% (blood donors; Abdul Mujeeb, Aamir, and Mehmood 2000) 3.01%–4.99% (blood donors; Sultan, Mehmood, and Mahmood 2007) 1.8% (blood donors; Akhtar et al. 2004) 1.18% (blood donors; Kakepoto et al. 1996) 7.5% (blood donors; Mujeeb and Pearce 2008) 4.1% (blood donors; Khattak et al. 2008) 0.5% (blood donors; college students; Mujeeb, Aamir, and Mehmood 2006; Abdul Mujeeb, Aamir, and Mehmood 2000) 2.8% (blood donors; weighted average in a review; Ali et al. 2009) 6.7% (general population; women; Parker, Khan, and Cubitt 1999)

(continued)

Table D.4 (Continued)

Country	Hepatitis C virus prevalence in different population groups
	5.31% (general population; Khokhar, Gill, and Malik 2004)
	15.9% (general population; Aslam and Aslam 2001)
	4.6% (general population; Aslam et al. 2005)
	33.7% (general population; rural area; Abbas et al. 2008)
	5.4% (general population; weighted average in a review; Ali et al. 2009)
	1.3% (children; Parker, Khan, and Cubitt 1999)
	1.6% (children; Jafri et al. 2006)
	0.44% (children; Agboatwalla et al. 1994)
	1.3% (children with HCV positive mothers; Parker, Khan, and Cubitt 1999)
	2.1% (children; weighted average in a review; Ali et al. 2009)
	21.0% (vaccinated population for smallpox; Aslam et al. 2005)
	5.6% (health care workers; Aziz et al. 2002)
	5.5% (health care workers; weighted average in a review; Ali et al. 2009)
	3.12% (hospital attendees; Khan et al. 2007)
	31.0% (operation room personnel; Mujeeb, Khatri, and Khanani 1998)
	88.0% (IDUs; Kuo et al. 2006)
	89.0% (IDUs; United Nations Office for Drug Control and Crime Prevention and UNAIDS 1999)
	60.0% (IDUs; Achakzai, Kassi, and Kasi 2007)
	87.0% (IDUs; Pakistan National AIDS Control Program 2005b)
	91.0% (IDUs; Pakistan National AIDS Control Program 2005b)
	22.0% (noninjecting drug users; Kuo et al. 2006)
	20.5% (household contacts of HCV positive thalassemic children; Akhtar et al. 2002)
	36.0% (type II diabetes patients; Ali et al. 2007)
	13.2% (transfusion patients; Rizvi and Fatima 2003)
	15.4% (transfusion patients; Rizvi and Fatima 2003)
	44.0% (patients who received frequent injections; Khan et al. 2000)
	33.0% (hepatocellular carcinoma cases; Abdul Mujeeb et al. 1997)
	60.0% (thalassemia patients; Bhatti, Amin, and Saleem 1995)
	34.8% (children with thalassemia; Akhtar and Moatter 2004)
	68.0% (hemodialysis patients; Gul and Iqbal 2003)
	23.7%–68.0% (hemodialysis patients; range in a review; Raja and Janjua 2008)
Saudi Arabia	4.3% (blood donors; Mahaba, el-Tayeb Ael, and Elbaz 1999)
	0.59% (blood donors; Bashawri et al. 2004)
	0.4% (blood donors; El-Hazmi 2004)
	1.7% (blood donors; Abdelaal et al. 1994)
	1.1% (blood donors; Shobokshi et al. 2003)
	3.6% (general population; males; Al Nasser 1992)
	3.1% (general population; females; Al Nasser 1992)
	1.7% (general population; males; Njoh and Zimmo 1997)
	3.2% (general population; non-Saudi persons; Njoh and Zimmo 1997)
	1.0% (children; Bakir et al. 1995)
	1.8% (children; Al-Faleh et al. 1991)
	0.1% (children; Shobokshi et al. 2003)
	0.7% (pregnant women; Shobokshi et al. 2003)
	2.2% (health care workers; Khan, Alkhalife, and Fathalla 2004)
	5.09% (different population groups; Mahaba, el-Tayeb Ael, and Elbaz 1999)
	74.6% (IDUs; Njoh and Zimmo 1997)
	10.5% (non-IDU drug dependent patients; Njoh and Zimmo 1997)
	5.87% (patients attending outpatient clinics; Saudis; Fakeeh and Zaki 1999)
	22.54% (patients attending outpatient clinics; Egyptians; Fakeeh and Zaki 1999)
	2.12% (patients attending outpatient clinics; Yemenis; Fakeeh and Zaki 1999)
	3.38% (patients attending outpatient clinics; other Middle Eastern origins; Fakeeh and Zaki 1999)
	4.98% (patients attending outpatient clinics; Asian countries origins; Fakeeh and Zaki 1999)
	41.9% (hemodialysis patients; Ayoola et al. 1991)
	9.24% (hemodialysis patients; including Bahraini patients; Qadi et al. 2004)

Table D.4 (Continued)

Country	Hepatitis C virus prevalence in different population groups
	15%–80% (hemodialysis patients; different dialysis units; Karkar 2007) 6.9% (hemodialysis patients; Mahaba, el-Tayeb Ael, and Elbaz 1999) 45.5% (hemodialysis patients; Al Nasser 1992) 55.7% (hemodialysis patients; Shobokshi et al. 2003) 43.4% (hemodialysis patients; Saxena and Panhotra 2004) 17.9% (schistosomiasis patients; Khan, Alkhalife, and Fathalla 2004) 21.0% (non-Hodgkin’s lymphoma patients; Harakati, Abualkhair, and Al-Knawy 2000) 63.6% (chronic liver disease patients; Ayoola et al. 1992) 11.0% (children under cancer chemotherapy; Bakir et al. 1995) 45.0% (multitransfused children; Al-Mugeiren et al. 1992)
Somalia	0.6% (blood donors; Nur et al. 2000) 0.97% (healthy adults; Aceti et al. 1993) 6.5% (healthy adults; Bile et al. 1993) 0.0% (children; Bile et al. 1992) 1.5% (children; Bile et al. 1992) 0.0% (children; Aceti et al. 1993) 1.8% (FSWs, STD clinic attendees, male soldiers, and tuberculosis patients; Watts et al. 1994) 2.4% (blood donors, hospitalized children and adults; Nur et al. 2000) 2.2% (hospitalized persons; Aceti et al. 1993) 40.3% (chronic liver disease patients; Bile et al. 1993)
Sudan	0.6% (pregnant women; Elsheikh et al. 2007) 0.36% (hospital attendees; Ati 2005) 2.2% (an area with a high prevalence of schistosomiasis; Mudawi et al. 2007) 34.0% (hemodialysis patients; El-Amin et al. 2007) 19.0% (hemodialysis patients; Kose et al. 2009) 3.0% (out-patient attendees; McCarthy et al. 1994)
Syrian Arab Republic	0.95% (blood donors; Othman and Monem 2002) 1.96% (FSWs; Othman and Monem 2002) 60.5% (IDUs; Othman and Monem 2002) 3.0% (health care workers; Othman and Monem 2001) 0.0% (laboratory workers; Othman and Monem 2001) 54.4% (hemodialysis patients; Moukeh et al. 2009) 6.0% (hemodialysis staff; Othman and Monem 2001) 0.0% (dentistry workers; Othman and Monem 2001) 0.0% (surgery workers; Othman and Monem 2001)
Tunisia	0.56% (blood donors; Hatira et al. 2000) 1.09% (blood donors; Slama et al. 1991) 1.7% (general population; Mejri et al. 2005) 0.2% (general population; Mejri et al. 2005) 0.71% (general population; Gorgi et al. 1998) 0.4% (general population; Triki et al. 1997) 39.7% (HIV patients; Kilani et al. 2007) 20.0% (hemodialysis patients; Hmaied et al. 2006) 32.6% (hemodialysis patients; Ben Othman et al. 2004) 45.10% (hemodialysis patients; Hmida et al. 1995) 42% (hemodialysis patients; Hachicha et al. 1995) 42.0% (hemodialysis patients; Jemni et al. 1994) 50.0% (hemophiliacs; Langar et al. 2005) 50.5% (hemophiliacs; Djebbi et al. 2008)
Turkey	0.4% (blood donors; Ozsoy et al. 2003) 0.38% (blood donors; Gurol et al. 2006) 0.19% (blood donors; Sakarya et al. 2004) 0.45% (blood donors; Altindis et al. 2006)

(continued)

Table D.4 (Continued)

Country	Hepatitis C virus prevalence in different population groups
	0.37% (blood donors; Mutlu, Meric, and Willke 2004)
	0.39% (blood donors; Afsar et al. 2008)
	0.28% (blood donors; Afsar et al. 2008)
	0.37% (blood donors; Afsar et al. 2008)
	1.0% (rural areas; general population; Akcam et al. 2009)
	2.3% (general population; men; Bozkurt et al. 2008)
	2.0% (general population; women; Bozkurt et al. 2008)
	2.1% (general population; Yildirim et al. 2009)
	0.6% (general population; Alim et al. 2009)
	0.1% (engaged couples; Alim et al. 2009)
	1.3% (study controls; Gulcan et al. 2008)
	2.8% (barbers; Candan et al. 2002)
	0.56% (soldiers; Altindis et al. 2006)
	0.45% (soldiers; Altindis et al. 2006)
	1.5% (health personnel; Koksai et al. 1991)
	0.3% (health care workers; Ozsoy et al. 2003)
	2.0% (spouses of chronic HCV patients; Tahan et al. 2005)
	0.77% (FSWs; Gul et al. 2008)
	2.8% (lymphoma patients; Sonmez et al. 2007)
	0.9% (gynecology and obstetrics patients; Tekay and Ozbek 2006)
	2.2% (outpatients; Demirturk et al. 2006)
	7.0% (predialytic chronic kidney disease patients; Sit et al. 2007)
	26.0% (hemodialysis patients; Selcuk et al. 2006)
	12.7% (hemodialysis patients; Ocak et al. 2006)
	43.6% (hemodialysis patients; Bozdayi et al. 2002)
	20.2% (hemodialysis patients; Selcuk et al. 2006)
	16.0% (hemodialysis patients; Selcuk et al. 2006)
	51.2% (hemodialysis patients; Koksai et al. 1991)
	0.0% (new hemodialysis patients; Koksai et al. 1991)
	24.4% (children with hemophilia; Kocabas et al. 1997b)
	4.0% (patients with multiple blood transfusions; Koksai et al. 1991)
	20.8% (diabetic patients; Ocak et al. 2006)
	3.2% (diabetic patients; Gulcan et al. 2008)
	5.8% (children with cancer; Kocabas et al. 1997a)
	2.0% at diagnosis and 14.0% at the end of cancer therapy (children with cancer; Kebudi et al. 2000)
West Bank and Gaza	2.2% (general population; Shemer-Avni et al. 1998)
Yemen, Republic of	1.1% (blood donors; Haidar 2002)
	2.1% (healthy persons; El Guneid et al. 1993)
	4.2% (healthy persons; Al-Mosliah and Al-Huraibi 2001)
	0.5% (health care workers; Haidar 2002)
	3.5% (health care workers; Shidrawi et al. 2004)
	37.1% (patients with liver disease; Al-Mosliah and Al-Huraibi 2001)
	21.5% (patients with liver disease; El Guneid et al. 1993)

Note: ANC = antenatal clinic; FSW = female sex worker; IDU = injecting drug user; STD = sexually transmitted disease.

Appendix E

Table E.1 Levels of HIV/AIDS Basic Knowledge in Different Population Groups

Country	High basic knowledge	Low basic knowledge
Afghanistan	University students (Mansoor et al. 2008) FSWs (World Bank 2008) HCWs (Todd et al. 2009)	General population women (Todd et al. 2007) General population women (van Egmond et al. 2004) Intrapartum patients (Todd et al. 2009) TB patients (Todd et al. 2007) High-risk groups (Action Aid Afghanistan 2006) IDUs (Zafar et al. 2003) FSWs (Action Aid Afghanistan 2006)
Djibouti	High school students (Rodier et al. 1993)	
Egypt, Arab Republic of	Nurses and university graduates (Mohsen 1998) General population women (Measure DHS 2004) General population women (<i>NEJM</i> 2008) Ever-married women (Measure DHS 2006) General population (Kabbash et al. 2007) Drug users (Salama et al. 1998) IDUs (Egypt MOH and Population National AIDS Program 2006) FSWs (Egypt MOH and Population National AIDS Program 2006) MSM (Egypt MOH and Population National AIDS Program 2006) MSM (El-Sayyed, Kabbash, and El-Gueniedy 2008)	Street children (Egypt MOH and Population National AIDS Program 2006) Squatter populations (Shama, Fiala, and Abbas 2002)
Iran, Islamic Republic of	Adolescents (Yazdi et al. 2006) Youth (Tehrani and Malek-Afzalip 2008) General population (Montazeri 2005) General population (Askarian, Mirzaei, and Assadian 2007) Truck drivers (Tehrani and Malek-Afzalip 2008) Teachers (Mazloomiy and Baghianimoghadam 2008) Runaways and other women seeking safe haven (Hajiabdolbaghi et al. 2007) Prisoners (Nakhaee 2002) FSWs (Tehrani and Malek-Afzalip 2008) MSM (Eftekhar et al. 2008) Former prisoners (Ebrahim 2008)	
Iraq	General population women (<i>NEJM</i> 2008)	
Jordan	General population women (Measure DHS 1998) General population women (Measure DHS 2003) General population women (<i>NEJM</i> 2008)	
Kuwait	Different populations (Al-Owaish et al. 1999)	

(continued)

Table E.1 (Continued)

Country	High basic knowledge	Low basic knowledge
Lebanon	General population (Lebanon National AIDS Control Program 1996; Jurjus et al. 2004) Prisoners (Mishwar 2008) IDUs (Aaraj [unknown]; Hermez et al. [unknown]) IDUs (Mishwar 2008) FSWs (Mishwar 2008) FSWs (Hermez et al. [unknown]) FSWs (Rady 2005) MSM (Mishwar 2008) MSM (Hermez et al. [unknown]; Dewachi 2001)	
Morocco	General population women (<i>NEJM</i> 2008) General population women (Zidouh [unknown]) Blood donors (Boutayeb, Aamoum, and Benchemsi 2006)	
Oman	College students (Al-Jabri and Al-Abri 2003)	
Pakistan	Female college students (Khan et al. 2005) Medical students (Ali et al. 1996) School students (Shaikh and Assad 2001) Obstetrics and gynecology clinic attendees (Haider et al. 2009) General population (Raza et al. 1998) Migrant workers (Faisal and Cleland 2006) IDUs (Pakistan National AIDS Control Program 2005a) IDUs (Pakistan National AIDS Control Program 2006–07) IDUs (Pakistan National AIDS Control Program 2008) Clients of FSWs (Bokhari et al. 2007) Clients of MSWs (Bokhari et al. 2007) Different high-risk groups (Pakistan National AIDS Control Program 2005c) FSWs (Jamal, Khushk, and Naeem 2006) FSWs (Bokhari et al. 2007) FSWs (Pakistan National AIDS Control Program 2005a) FSWs (Pakistan National AIDS Control Program 2006–07) MSWs (Pakistan National AIDS Control Program 2005a) MSWs (Pakistan National AIDS Control Program 2006–07) 66.5% MSWs (Pakistan National AIDS Control Program 2008) HSWs (Pakistan National AIDS Control Program 2005a) HSWs (Pakistan National AIDS Control Program 2006–07) 66.5% HSWs (Pakistan National AIDS Control Program 2008) <i>Hijras</i> (Baqi et al. 1999) <i>Hijras</i> (Bokhari et al. 2007)	Rural adolescents (Raheel et al. 2007) Ever-married women (Measure DHS 2007) Paramedicals (Siddiqi, Majeed, and Saeed Khan 1995) Private health practitioners (Khan 1995) Pakistanis traveling abroad (Pakistan AIDS Prevention Society 1992–93) Fishermen (Sheikh et al. 2003) Male prisoners (Khawaja et al. 1997) IDUs (Haque et al. 2004) IDUs (Afghani refugees; Zafar et al. 2003) IDUs (Khawaja et al. 1997) Dancing girls, usually FSWs and their clients (Haroon 1994)
Saudi Arabia	Students (Abolfotouh 1995) Paramedical students (Al-Mazrou, Abouzeid, and Al-Jeffri 2005) Men in a management training institute (Badahdah 2005) HCWs (Al-Ghanim 2005)	General population women (IGAD 2006) HCWs (Mahfouz et al. 1995)
Somalia		Youth (WHO/EMRO 2000) General population (WHO/EMRO 2000) Traveling merchants/drivers (WHO/EMRO 2000)

Table E.1 (Continued)

Country	High basic knowledge	Low basic knowledge
Sudan	Street children (Ahmed 2004h) Youth (SNAP, UNICEF, and UNAIDS 2005) High school students (Elzubier, el Nour, and Ansari 1996) High school teachers and students (Elzubier, el Nour, and Ansari 1996) University students (Sudan National HIV/AIDS Control Program 2004) University students (Sudan National HIV/AIDS Control Program 2004; Ahmed 2004i) ANC women attendees (Mahmoud et al. 2007) ANC women attendees (Ahmed 2004b) Pregnant women (UNAIDS/WHO 2005) General population (Southern Sudan; NSNAC and UNAIDS 2006) General population (Southern Sudan; UNHCR 2007) Tea sellers (Gutbi and Eldin 2006) Tea sellers (Ati 2005) Tea sellers (Ahmed 2004j) Rural populations (SNAP, UNICEF, and UNAIDS 2005) Military personnel (Ahmed 2004d) Military personnel (Sudan National HIV/AIDS Control Program 2004) Prisoners (Assal 2006) Prisoners (Ahmed 2004e) Prisoners (Ati 2005) Truck drivers (Ahmed 2004k) Truck drivers (Farah and Hussein 2006) Internally displaced persons (Ahmed 2004c) Internally displaced persons (IGAD 2006) Sudanese refugees in Ethiopia (Holt et al. 2003) TB patients (Ahmed 2004i) STD clinic attendees (Ahmed 2004g) Suspected PLHIV (Ahmed 2004a) IDUs (Bayoumi 2005) FSWs (ACORD 2005) FSWs (Ati 2005) FSWs (ACORD 2006) FSWs (Yousif 2006) FSWs (Ahmed 2004f) MSM (Elrashied 2006)	
Syrian Arab Republic	FSWs (Syria National AIDS Programme 2004) IDUs (Syria Mental Health Directorate 2008)	
Tunisia	MSM (Hsairi and Ben Abdallah 2007)	
Turkey	High school students (Savaser 2003) General population (Ayranci 2005) Drug users and nondrug users (Soskolne and Maayan 1998) FSWs (Gul et al. 2008)	
United Arab Emirates	University students (Ganczak et al. 2007)	

(continued)

Table E.1 (Continued)

Country	High basic knowledge	Low basic knowledge
Yemen, Republic of	Youth (Al-Serouri 2005) Secondary school students (Gharamah and Baktayan 2006) Secondary school students (Raja and Farhan 2005) General population (Al-Serouri et al. 2002) General population (Busulwa 2003) Marginalized minority (Al-Akhdam) (Busulwa 2003) Returnee families from abroad (Busulwa 2003)	

Note: ANC = antenatal clinic; FSW = female sex worker; HCW = health care worker; HSW = *hrija* sex worker; IDU = injecting drug user; MSM = men who have sex with men; PLHIV = people living with HIV; STD = sexually transmitted disease; TB = tuberculosis.

Table E.2 MENA Populations with Low Levels of Comprehensive HIV/AIDS Knowledge

Country	Low comprehensive knowledge
Afghanistan	University students (Mansoor et al. 2008) Intrapartum patients (Todd et al. 2009) HCWs (Todd et al. 2007; Todd et al. 2009)
Egypt, Arab Republic of	Adolescents (El-Tawila et al. 1999) Students (Farghaly and Kamal 1991) Teachers (Farghaly and Kamal 1991) General population women (Measure DHS 2006) General population women (Measure DHS 2004) HCWs (Faris and Shouman 1994) Physicians (Sallam et al. 1995)
Iran, Islamic Republic of	Youth (Tehrani and Malek-Afzalip 2008) High school students (Tavoosi et al. 2004) Dentists (Askarian, Mirzaei, and Cookson 2007) Truck drivers (Tehrani and Malek-Afzalip 2008) Prisoners (Nakhaee 2002) FSWs (Tehrani and Malek-Afzalip 2008) MSM (Eftekhari et al. 2008)
Jordan	University students (Petro-Nustas, Kulwicki, and Zumout 2002; Petro-Nustas 2000) General population women (Measure DHS 1998) General population women (Measure DHS 2003)
Kuwait	Physicians (Fido and Al Kazemi 2002)
Lebanon	General population (Jurjus et al. 2004)
Morocco	General population women (Zidouh [unknown])
Pakistan	Adolescents (Ali, Bhatti, and Ushijima 2004) Medical students (Shaikh et al. 2007) General population (Raza et al. 1998) HCWs (Najmi 1998) IDUs (Khawaja et al. 1997) FSWs (Jamal, Khushk, and Naeem 2006) FSWs (Pakistan National AIDS Control Program 2005a) FSWs (Pakistan National AIDS Control Program 2006–07) <i>Hijras</i> (Baqi et al. 1999)
Saudi Arabia	Paramedical students (Al-Mazrou, Abouzeid, and Al-Jeffri 2005) Primary health care users (Al-Ghanim 2005) Men in a management training institute (Badahdah 2005) Bus drivers (Abdelmoneim et al. 2002)

Table E.2 (Continued)

Country	Low comprehensive knowledge
Somalia	Young women (Somaliland Ministry of Health and Labour 2007) General population (WHO 2004) Somali immigrants to Denmark (Lazarus et al. 2006)
Sudan	Street children (Ahmed 2004h) Youth (SNAP, UNICEF, and UNAIDS 2005) University students (Sudan National HIV/AIDS Control Program 2004) University students (Ahmed 2004i) ANC women attendees (Ahmed 2004b) General population (Southern Sudan; NSNAC and UNAIDS 2006) Tea sellers (Ahmed 2004j) Tea sellers (Ati 2005) Internally displaced persons (Ahmed 2004c) Sudanese immigrants to Denmark (Lazarus et al. 2006) Sudanese immigrant to the U.S.A. (Tompkins et al. 2006) Sudanese refugees in Ethiopia (Holt et al. 2003) Military personnel (Ahmed 2004d) Military personnel (Sudan National HIV/AIDS Control Program 2004) Prisoners (Ahmed 2004e) Prisoners (Assal 2006) Truck drivers (Farah and Hussein 2006) Truck drivers (Ahmed 2004k) TB patients (Ahmed 2004i) STD clinic attendees (Ahmed 2004g) Suspected AIDS patients (Ahmed 2004a) FSWs and tea sellers (Basha 2006) FSWs (ACORD 2005) FSWs (Ati 2005) FSWs (ACORD 2006) FSWs (Yousif 2006) FSWs (Ahmed 2004f) MSM (Elrashied 2006)
Syrian Arab Republic	IDUs (Syria Mental Health Directorate 2008)
Turkey	Street children (Baybuga and Celik 2004) Youth (Baybuga and Celik 2004)
United Arab Emirates	University students (Ganczak et al. 2007)
West Bank and Gaza	Youth (PFPPA 2005)
Yemen, Republic of	Youth (Al-Serouri 2005) General population (Busulwa 2003) Marginalized minority (Al-Akhdam) (Busulwa 2003) Returnee families from abroad (Busulwa 2003)

Note: ANC = antenatal clinic; FSW = female sex worker; HCW = health care worker; IDU = injecting drug user; MSM = men who have sex with men; STD = sexually transmitted disease; TB = tuberculosis.

Table E.3 MENA Populations with High Levels of HIV/AIDS Misinformation

Country	High levels of misinformation
Djibouti	Truck drivers (O'Grady 2004)
Egypt, Arab Republic of	Squatter populations (Shama, Fiala, and Abbas 2002) Physicians (Sallam et al. 1995) HCWs (Faris and Shouman 1994) IDUs (Egypt MOH and Population National AIDS Program 2006) FSWs (Egypt MOH and Population National AIDS Program 2006) MSM (Egypt MOH and Population National AIDS Program 2006)
Iran, Islamic Republic of	Adolescents (Mohammadi et al. 2006) Adolescents (Yazdi et al. 2006) Youth (Tehrani and Malek-Afzalip 2008) Teachers (Mazloomi and Baghianimoghadam 2008) General population (Askarian, Mirzaei, and Assadian 2007) General population (Montazeri 2005) General population (Hedayati-Moghaddam 2008) Truck drivers (Tehrani and Malek-Afzalip 2008) FSWs (Tehrani and Malek-Afzalip 2008) MSM (Eftekhari et al. 2008)
Jordan	Youth (Jordan National AIDS Control Programme 2005)
Kuwait	Different populations (Al-Owaish et al. 1999)
Lebanon	Prisoners (Mishwar 2008)
Morocco	General population women (Zidouh [unknown])
Oman	College students (Al-Jabri and Al-Abri 2003)
Pakistan	Adolescents (Ali, Bhatti, and Ushijima 2004) Female college students (Farid and Choudhry 2003) School students (Shaikh and Assad 2001) Obstetrics and gynecology clinic attendees (Haider et al. 2009) General population (Raza et al. 1998) Pakistanis traveling abroad (Pakistan AIDS Prevention Society 1992–93) FSWs (Jamal, Khushk, and Naeem 2006)
Saudi Arabia	Paramedical students (Al-Mazrou, Abouzeid, and Al-Jeffri 2005)
Sudan	Street children (Ahmed 2004h) Street children (Kudrati et al. 2002; Kudrati, Plummer, and Yousif 2008) Youth (SNAP, UNICEF, and UNAIDS 2005) High school students (Elzubier, el Nour, and Ansari 1996) University students (Ahmed 2004i) University students (Sudan National HIV/AIDS Control Program 2004) Teachers (Elzubier, el Nour, and Ansari 1996) ANC women attendees (Ahmed 2004b) General population (Southern Sudan) (NSNAC and UNAIDS 2006) Tea sellers (Gutbi and Eldin 2006), Tea sellers (Ahmed 2004j) Internally displaced persons (Ahmed 2004c) Military personnel (Sudan National HIV/AIDS Control Program 2004) Military personnel (Ahmed 2004d) Prisoners (Ahmed 2004e) Prisoners (Assal 2006) Truck drivers (Ahmed 2004k) Truck drivers (Farah and Hussein 2006) TB patients (Ahmed 2004i) STD clinic attendees (Ahmed 2004g) Suspected PLHIV (Ahmed 2004a)

Table E.3 (Continued)

Country	High levels of misinformation
	FSWs and tea sellers (Basha 2006) FSWs (ACORD 2006) FSWs (Yousif 2006) FSWs (ACORD 2005) FSWs (Ahmed 2004f) MSM (Elrashied 2006)
Syrian Arab Republic	FSWs (Syria National AIDS Programme 2004) IDUs (Syria Mental Health Directorate 2008)
Tunisia	MSM (Hsairi and Ben Abdallah 2007)
Turkey	Street children (Baybuga and Celik 2004) Youth (Baybuga and Celik 2004) General population (Ayranci 2005) Drug users and nondrug users (Soskolne and Maayan 1998)
United Arab Emirates	University students (Ganczak et al. 2007)
West Bank and Gaza	Youth (PFPPA 2005)
Yemen, Republic of	Youth (Al-Serouri 2005) Secondary school students (Gharamah and Baktayan 2006) General population (Al-Serouri et al. 2002)

Note: ANC = antenatal clinic; FSW = female sex worker; IDU = injecting drug user; MSM = men who have sex with men; PLHIV = people living with HIV; STD = sexually transmitted disease; TB = tuberculosis.

Table E.4 Nature of Attitudes toward People Living with HIV/AIDS by Different Population Groups

Country	Negative attitudes toward people living with HIV/AIDS	Positive attitudes toward people living with HIV/AIDS
Djibouti	Dockers and truck drivers (O'Grady 2004)	
Egypt, Arab Republic of	General population women (Measure DHS 2006) Tourism workers (El-Sayyed, Kabbash, and El-Gueniedy 2008) Industrial workers (El-Sayyed, Kabbash, and El-Gueniedy 2008) Drug users (Salama et al. 1998)	
Iran, Islamic Republic of	Adolescents (Yazdi et al. 2006) High school students (Tavoosi et al. 2004) Teachers (Mazloomi and Baghianimoghadam 2008) PLHIV (Sherafat-Kazemzadeh et al. 2003) MSM (Eftekhar et al. 2008)	General population (Montazeri 2005) General population (IRIB 2006) Former prisoners (Ebrahim 2008)
Jordan	College students (Petro-Nustas, Kulwicki, and Zumout 2002) General population women (Measure DHS 2003) General population women (Measure DHS 2003) Dentists (El-Maaytah et al. 2005)	

(continued)

Table E.4 (Continued)

Country	Negative attitudes toward people living with HIV/AIDS	Positive attitudes toward people living with HIV/AIDS
Lebanon	General population (Othman and Monem 2002; Lebanon National AIDS Control Program 1996) General population (Lebanon National AIDS Control Program 2003)	General population (Jurjus et al. 2004) General population (Lebanon National AIDS Control Program 2003)
Libya	High school students (El-Gadi, Abudher, and Samud 2008)	High school students (El-Gadi, Abudher, and Samud 2008)
Morocco		General population (Zidouh [unknown])
Saudi Arabia	Paramedical students (Al-Mazrou, Abouzeid, and Al-Jeffri 2005)	
Somalia		Youth (WHO/EMRO 2000) General population (WHO 2004) General population (WHO/EMRO 2000) Traveling merchants/drivers (WHO/EMRO 2000)
Sudan	Street children (Ahmed 2004h) Youth (SNAP, UNICEF, and UNAIDS 2005) University students (Sudan National HIV/AIDS Control Program 2004) University students (Ahmed 2004i) ANC women attendees (Ahmed 2004b) General population (Southern Sudan; UNHCR 2007) Tea sellers (Ahmed 2004j) Internally displaced persons (Ahmed 2004c) Military personnel (Ahmed 2004d) Military personnel (Sudan National HIV/AIDS Control Program 2004) Prisoners (Assal 2006) Prisoners (Ahmed 2004e) Truck drivers (Farah and Hussein 2006) Truck drivers (Ahmed 2004k) TB patients (Ahmed 2004i) STD clinic attendees (Ahmed 2004g) Suspected AIDS patients (Ahmed 2004a) FSWs (Yousif 2006) FSWs (Ahmed 2004f) MSM (Elrashied 2006)	University students (Sudan National HIV/AIDS Control Program 2004) General population (Southern Sudan; UNHCR 2007)
Syrian Arab Republic	FSWs (Syria National AIDS Programme 2004)	
Turkey		General population (Ayranci 2005)
United Arab Emirates	University students (Ganczak et al. 2007)	
West Bank and Gaza	General population (UNAIDS 2007c) General population women (UNAIDS 2007c)	

Table E.4 (Continued)

Country	Negative attitudes toward people living with HIV/AIDS	Positive attitudes toward people living with HIV/AIDS
Yemen, Republic of	Youth (Al-Serouri 2005) Secondary school students (Gharamah and Baktayan 2006) General population (Busulwa 2003) Marginalized minority (Al-Akhdam; Busulwa 2003) Returnee families from abroad (Busulwa 2003)	Secondary school students (Gharamah and Baktayan 2006) General population (Al-Serouri et al. 2002)

Note: ANC = antenatal clinic; FSW = female sex worker; MSM = men who have sex with men; STD = sexually transmitted disease; TB = tuberculosis.

Table E.5 Television as the Main Source of HIV/AIDS Knowledge, by MENA Population Groups

Country	Populations that identified television as the main source of HIV/AIDS knowledge
Egypt, Arab Republic of	Street children (Egypt MOH and Population National AIDS Program 2006) University students (Refaat 2004) General population women (Measure DHS 2004) General population women (Measure DHS 2006) Squatter populations (Shama, Fiala, and Abbas 2002) HCWs (Faris and Shouman 1994) IDUs (Egypt MOH and Population National AIDS Program 2006) FSWs (Egypt MOH and Population National AIDS Program 2006) MSM (Egypt MOH and Population National AIDS Program 2006)
Iran, Islamic Republic of	Adolescents (Yazdi et al. 2006) Youth (Tehrani and Malek-Afzalip 2008) High school students (Tavoosi et al. 2004) High school students (Karimi and Ataei 2007) Teachers (Mazloomi and Baghianimoghadam 2008) General population (Montazeri 2005) General population (Ministry of Health and Medical Education of Iran 2006) Truck drivers (Tehrani and Malek-Afzalip 2008) FSWs (Tehrani and Malek-Afzalip 2008)
Pakistan	Female college students (Khan et al. 2005) Male prisoners (Khawaja et al. 1997) IDUs (Khawaja et al. 1997) FSWs (Jamal, Khushk, and Naeem 2006)
Sudan	Youth (SNAP, UNICEF, and UNAIDS 2005) University students (Ahmed 2004) University students (Sudan National HIV/AIDS Control Program 2004) Military personnel (Sudan National HIV/AIDS Control Program 2004)
Turkey	High school students (Savaser 2003) College students (Ungan and Yaman 2003)
West Bank and Gaza	General population women (Husseini and Abu-Rmeileh 2007)
Yemen, Republic of	Youth (Al-Serouri 2005) High school students (Raja and Farhan 2005) General population (Al-Serouri et al. 2002) General population (Busulwa 2003) Marginalized minority (Al-Akhdam) (Busulwa 2003) Returnee families from abroad (Busulwa 2003)

Note: FSW = female sex worker; HCW = health care worker; IDU = injecting drug user; MSM = men who have sex with men.

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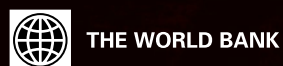
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Despite global progress in understanding the epidemiology of the human immunodeficiency virus (HIV), knowledge about the epidemic in the Middle East and North Africa (MENA) remains very limited and subject to much controversy. In the more than 25 years since the discovery of HIV, no scientific study has provided a comprehensive, data-driven synthesis of the spread of HIV/AIDS (acquired immunodeficiency syndrome) in the region. Consequently, the effectiveness of policies, programs, and resources intended to address the spread of HIV/AIDS has been compromised.

This report aims to fill the knowledge gap by providing the first-ever comprehensive scientific assessment and data-driven epidemiological synthesis of HIV's spread in MENA. It is based on a literature review and analysis of thousands of largely unrecognized publications, reports, and data sources extracted from scientific literature or collected from sources at the local, national, and regional levels. The resulting collection of data provides a solid foundation on which efforts to stem the spread of HIV/AIDS can be based.

Characterizing the HIV/AIDS Epidemic in the Middle East and North Africa will be of particular interest to policy makers, researchers, development practitioners, and specialists in public health and epidemiology. It builds on two prior publications: *HIV/AIDS in the Middle East and North Africa: The Cost of Inaction* (published in 2003) and *Preventing HIV/AIDS in the Middle East and North Africa: A Window of Opportunity to Act* (published in 2005).



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