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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This report presents the findings of the synthesis of existing data and other information on the HIV/AIDS (human immunodeficiency virus/acquired immunodeficiency syndrome) epidemics in the Middle East and North Africa (MENA) made up of countries covered by the World Bank, the Joint United Nations Programme on HIV/AIDS (UNAIDS) MENA Regional Support Team (RST), and the Eastern Mediterranean Regional Office (EMRO) of the World Health Organization (WHO). The synthesis supports countries to better define their epidemic (“know your epidemic”) in order to plan and implement more strategic actions to prevent or reduce further transmission of the infection and to also mitigate the impact of the infection on those already infected and affected.

The report is a joint interagency effort between the World Bank MENA Region, UNAIDS MENA RST, and WHO/EMRO. The team was led by Francisca Ayodeji Akala (Task Team Leader and Senior Public Health Specialist, World Bank) and includes Laith J. Abu-Raddad (Principal Investigator of the scientific study; World Bank Consultant; Director of Epidemiology, Biostatistics and Biomathematics Research Core; Assistant Professor in Public Health at Weill Cornell Medical College, Qatar), Iris Semini (UNAIDS MENA RST), Gabriele Riedner (WHO/EMRO), David Wilson (World Bank), Ousama Tawil (UNAIDS MENA RST), Hamidreza Setayesh (UNAIDS MENA RST), Fatou Fall (World Bank), and Juliana Victor-Ahuchogu (World Bank). The report was prepared under the guidance of Akiko Maeda, World Bank MENA, Health, Nutrition, and Population Sector Manager. The peer reviewers of the report are Jody Kusek (World Bank), Partricio Marquez (World Bank), Barbara O. de Zalduondo (UNAIDS), Robert Lyerla (UNAIDS), Ying Lo-Ru (WHO), and Yves Souteyrand (WHO). We appreciate their time and efforts in providing useful comments that were helpful in strengthening the final report.

We would like to specially acknowledge the valuable scientific contributions to this project of Nahla Hilmi (Research Assistant and World Bank consultant) and Manal Benkirane (Research Assistant and UNAIDS consultant). Nahla was instrumental in conducting systematic literature reviews and epidemiological analyses. Manal provided epidemiological summaries and translations of French language data and documents.

This project could not have been conducted without the support of organizations and agencies at the international and national levels in providing documents, other data sources, and input for the purpose of this synthesis. In particular, we thank the UNAIDS MENA RST and WHO/EMRO for providing hundreds of documents and other data sources to be investigated for this project. Among the many colleagues who provided data, documents, or input are Ahmad Sayed Alinaghi (Iranian Research Center for HIV/AIDS, the Islamic Republic of Iran), Ramzi Alsaiaq (Fred Hutchinson Cancer Research Center), Alia Al-Tayyib (Colorado Department of Public Health), Rhoda Ashley Morrow (University of Washington), Ruanne Barnabas (Fred Hutchinson Cancer Research Center), Veronique Bortolotti (WHO/EMRO), Hiam Chemaitelly (Weill Cornell Medical College, Qatar), Jesus M. Garcia Calleja (WHO), Jocelyn DeJong (American University of Beirut), Paul Drain (University of Washington), Golda El-Khoury (United Nations Children’s Fund [UNICEF]), Majdi Al-Touhki (World Bank),
Ali Feizzadeh (UNAIDS/Iran), Sarah Hawkes (London School of Hygiene and Tropical Medicine), Joumana Hermez (WHO/EMRO), Rachel Kaplan (University of California, Los Angeles), Adnan Khan (Research and Development Solutions), Hamida Khattabi (WHO/EMRO), Laura Koutsky (University of Washington), Abdalla Ismail (WHO/Somalia), Wadih Maalouf (United Nations Office on Drugs and Crime), Carla Makhlouf Obermeyer (WHO), Yolisa Sarah Mashologu (WHO/EMRO), Willi McFarland (University of California, San Francisco), Dewolfe Miller (University of Hawaii), Ghina Mumtaz (Weill Cornell Medical College, Qatar), Agnes Nabaloga (World Bank), Yaa Oppong (World Bank), Assad Rahal (National AIDS Program/Jordan), Marian Schilperoord (United Nations High Commissioner for Refugees), George Schmid (WHO), Joshua Schiffer (Fred Hutchinson Cancer Research Center), Sharif Sawires (University of California, Los Angeles), Cherif Soliman (Family Health International), Anna Wald (University of Washington), Helen Weiss (London School of Hygiene and Tropical Medicine), Najin Yasrebi (UNICEF), Saman Zamani (Kyoto University), and Hany Ziady (WHO/EMRO).

We greatly appreciate and thank all the researchers, research participants, and data contributors who contributed to the body of evidence, data, and research that were reviewed and synthesized for this work: the most comprehensive research work on HIV/AIDS in MENA since the beginning of the epidemic.
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.”

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.

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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 is 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 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 epidemiology 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 reflection 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.

**BIBLIOGRAPHY**

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

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
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<tbody>
<tr>
<td>AIDS</td>
<td>Acquired immunodeficiency syndrome</td>
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<tr>
<td>ANC</td>
<td>Antenatal clinic</td>
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<td>ART</td>
<td>Antiretroviral therapy</td>
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<td>ARV</td>
<td>Antiretroviral</td>
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<td>ASR</td>
<td>Age-standardized rates</td>
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<td>DHS</td>
<td>Demographic and Health Survey</td>
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<td>ELISA</td>
<td>Enzyme-linked immunoassay</td>
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<td>EMRO</td>
<td>Eastern Mediterranean Regional Office (World Health Organization)</td>
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<td>FBO</td>
<td>Faith-based organization</td>
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<td>FHI</td>
<td>Family Health International</td>
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<td>FSW</td>
<td>Female sex work(er)</td>
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<td>GFATM</td>
<td>Global Fund to Fight AIDS, Tuberculosis, and Malaria</td>
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<td>GONGO</td>
<td>Government organized nongovernmental organizations</td>
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<td>GST</td>
<td>Group of sustainable transmission</td>
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<td>GUD</td>
<td>Genital ulcer disease</td>
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<td>HBV</td>
<td>Hepatitis B virus</td>
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<td>HCV</td>
<td>Hepatitis C virus</td>
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<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>HCWs</td>
<td>Health care workers</td>
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<td>HIV</td>
<td>Human immunodeficiency virus</td>
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<td>HPV</td>
<td>Human papillomavirus</td>
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<td>HSV-1</td>
<td>Herpes simplex virus type 1</td>
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<tr>
<td>HSV-2</td>
<td>Herpes simplex virus type 2</td>
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<tr>
<td>HSW</td>
<td><em>Hjira</em> sex worker</td>
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<tr>
<td>IARC</td>
<td>International Agency for Research on Cancer</td>
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<td>IEC</td>
<td>Information, Education, and Communication</td>
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<td>IBBSS</td>
<td>Integrated biobehavioral surveillance survey</td>
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<td>ICPS</td>
<td>International Centre for Prison Studies</td>
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<td>IDPs</td>
<td>Internally displaced persons</td>
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<td>IDU</td>
<td>Injecting drug use(r)</td>
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<td>INCAS</td>
<td>Iranian National Center for Addiction Studies</td>
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<td>IOM</td>
<td>International Organization for Migration</td>
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<td>KAP</td>
<td>Knowledge attitudes and practices</td>
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<td>MENA</td>
<td>Middle East and North Africa</td>
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<td>MENAHRA</td>
<td>MENA Harm Reduction Association</td>
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<td>MeSH</td>
<td>Medical subheading</td>
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<td>M&amp;E</td>
<td>Monitoring and evaluation</td>
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<td>MMT</td>
<td>Methadone maintenance treatment</td>
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<td>MOH</td>
<td>Ministry of health</td>
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<td>MSM</td>
<td>Men who have sex with men</td>
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<td>MSW</td>
<td>Male sex work(er)</td>
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<td>NGO</td>
<td>Nongovernmental organization</td>
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<td>NSNAC</td>
<td>New Sudan National AIDS Council</td>
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<td>NSP</td>
<td>National strategic plan</td>
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<td>NSP</td>
<td>Needle and syringe program</td>
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<td>OST</td>
<td>Opioid substitution therapy</td>
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<td>PITC</td>
<td>Provider initiated testing and counseling</td>
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<td>PLHIV</td>
<td>People living with HIV</td>
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<td>PMTCT</td>
<td>Prevention of mother-to-child transmission</td>
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<td>PRB</td>
<td>Population Reference Bureau</td>
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<td>RSA</td>
<td>Rapid situation assessment</td>
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<td>RST</td>
<td>Regional Support Team</td>
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<td>RTI</td>
<td>Reproductive tract infection</td>
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<td>SAR</td>
<td>South Asia Region</td>
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<td>SNAP</td>
<td>Sudan National AIDS Programme</td>
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<tr>
<td>STD</td>
<td>Sexually transmitted disease</td>
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<td>STI</td>
<td>Sexually transmitted infection</td>
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<td>TB</td>
<td>Tuberculosis</td>
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<td>UN</td>
<td>United Nations</td>
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<td>UNAIDS</td>
<td>Joint United Nations Programme on HIV/AIDS</td>
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<td>UNDP</td>
<td>United Nations Development Programme</td>
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<td>UNFPA</td>
<td>United Nations Population Fund</td>
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<td>UNHCR</td>
<td>United Nations High Commissioner for Refugees</td>
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<tr>
<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
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<tr>
<td>UNODC</td>
<td>United Nations Office on Drugs and Crime</td>
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<tr>
<td>UNRWA</td>
<td>United Nations Relief and Works Agency for Palestine Refugees in the Near East</td>
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<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
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<td>VCT</td>
<td>Voluntary counseling and testing</td>
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<td>WBA</td>
<td>Western blot assays</td>
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<td>WHO</td>
<td>World Health Organization</td>
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Chapter 1

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) region in 2008. This brings the total number of people living with HIV (PLHIV) in MENA to 310,000 (250,000–380,000). It is also estimated that 20,000 (15,000–25,000) people died of HIV-related causes in 2008. 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. 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.”

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.
3 Ibid.
4 Ibid.
5 Obermeyer, “HIV in the Middle East.”
6 Bohannon, “Science in Libya.”
Characterizing the HIV/AIDS Epidemic in the Middle East and North Africa

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, 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. 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. The cultural tradition of balancing premarital chastity with early marriage is no longer the norm. Social and gender tensions have been exacerbated by the clashing forces of traditional culture and modern culture. 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. 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, is in the 15–24 years age group, the normal age range of initiation of sexual activities. Extensive levels of migration, displacement, and mobility exist in MENA, which has the highest number of refugees and internally displaced persons in the world. 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. 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, 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. 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. 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. This

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7 Carael, Cleland, and Adeokun, “Overview and Selected Findings.”
9 Roudi-Fahimi and Ashford, Sexual & Reproductive Health.
10 Roudi-Fahimi and Ashford, Sexual & Reproductive Health.
11 Busulwa, “HIV/AIDS Situation Analysis Study.”
12 Mohamed et al., “Sexual Risk-Taking Behaviors.”
13 Abukhaili, “Gender Boundaries and Sexual Categories in the Arab World.”
14 Shaar and Larenas, “Social Determinants of Health.”
15 Assaad and Roudi-Fahimi, “Youth in the Middle East and North Africa.”
17 Roudi-Fahimi and Ashford, Sexual & Reproductive Health.
18 UNAIDS, “Notes on AIDS in the Middle East and North Africa.”
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 debilitating 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

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. 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, male circumcision status, and coinfections.

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. 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) 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.”
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 behavior 32 and injecting drug use, 33 the higher

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

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


33 Latkin and Vlahov, “Socially Desirable Response Tendency.”
Characterizing the HIV/AIDS Epidemic in the Middle East and North Africa

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:

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34 Tehrani and Malek-Afzalip, "Knowledge, Attitudes and Practices."
35 Hajiabdolbaghi et al., "Insights from a Survey of Sexual Behavior."
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 databases, 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. 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.

BIBLIOGRAPHY


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.*
\(^3\) UNAIDS, “Notes on AIDS in the Middle East and North Africa.”
\(^4\) Iran Center for Disease Management, “AIDS/HIV Surveillance Report.”
\(^6\) Ibid.
\(^7\) Todd et al., “HIV, Hepatitis C, and Hepatitis B.”
\(^8\) Al-Haddad, Baig, and Ebrahim, “Epidemiology of HIV and AIDS in Bahrain.”
\(^10\) Ibid.
\(^13\) 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

<table>
<thead>
<tr>
<th>Country</th>
<th>Surveys’ results for HIV prevalence among IDUs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>0.0% (World Bank 2008) 3.0% (Todd et al. 2007; Sanders-Buell et al. 2007) 3.4% (Mathers et al. 2008)</td>
</tr>
<tr>
<td>Algeria</td>
<td>11.0% (self-reported; Mimouni and Ramaoun 2006; Algeria MOH [unknown])</td>
</tr>
<tr>
<td>Bahrain</td>
<td>0.0%–2.3% (Aceijas et al. 2004) 21.1% (Al-Haddad et al. 1994) 0.3% (Mathers et al. 2008)</td>
</tr>
<tr>
<td>Egypt, Arab Republic of</td>
<td>0.15% (drug addicts; Watts et al. 1993) 0.0% (El-Ghazawi, Hunsmann, and Schneider 1987) 0.0% (Baqi et al. 1998)</td>
</tr>
<tr>
<td></td>
<td>0.0% (Aceijas et al. 2004) 0.0% (Saleh et al. 2000; El-Ghazawi et al. 1995) 0.6% (Egypt MOH and Population National AIDS Program 2006)</td>
</tr>
<tr>
<td>Iran, Islamic Republic of</td>
<td>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)</td>
</tr>
<tr>
<td></td>
<td>7.0% (incarcerated IDUs; Rahbar, Rooholamini, and Khoshnood 2004) 0.0% (treatment center; Rahbar, Rooholamini, and Khoshnood 2004)</td>
</tr>
<tr>
<td></td>
<td>63.0% (up to, in prisons; UNAIDS and WHO 2003) 30.0% (local prison; Nasiririmanesh 2002) 6.9% (incarcerated IDUs; Rahbar, Rooholamini, and Khoshnood 2004)</td>
</tr>
<tr>
<td></td>
<td>22.0% (newly admitted IDUs to prison; Farhoudi et al. 2003) 24.0% (resident incarcerated IDUs in prison; Farhoudi et al. 2003)</td>
</tr>
<tr>
<td></td>
<td>24.4% (incarcerated IDUs; Jahani et al. 2009) 0.8% (Khani and Vakili 2003) 15.2% (Zamani et al. 2005)</td>
</tr>
<tr>
<td></td>
<td>23.2% (Zamani et al. 2006) 5.4% (noninjecting drug users; Zamani et al. 2005) 72.0% (a rural population of highly selected IDUs; Mojtabahzadeh et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>1.4% (mainly noninjecting drug users; Talai et al. 2007) 15.0% (Mathers et al. 2008)</td>
</tr>
<tr>
<td>Iraq</td>
<td>0.0% (prior to occupation; Aceijas et al. 2004)</td>
</tr>
<tr>
<td>Jordan</td>
<td>4.2% (Aceijas et al. 2004)</td>
</tr>
<tr>
<td>Kuwait</td>
<td>0.0% (Aceijas et al. 2004)</td>
</tr>
<tr>
<td>Lebanon</td>
<td>7.8% (Aceijas et al. 2004) 0.0% (Mithwari 2008)</td>
</tr>
<tr>
<td>Libya</td>
<td>0.5% (UNAIDS 2002b) 59.4% (Groterah 2002) 49.0% (up to; UNAIDS and WHO 2003) 22.0% (Mathers et al. 2008)</td>
</tr>
<tr>
<td>Oman</td>
<td>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)</td>
</tr>
<tr>
<td></td>
<td>27.0% (incarcerated IDUs; Oman MOH 2006) 11.8% (Mathers et al. 2008)</td>
</tr>
<tr>
<td>Morocco</td>
<td>6.5% (self-reported; Mathers et al. 2008) 1.6% (Alami 2009) 0.0% (Morocco MOH 2007)</td>
</tr>
<tr>
<td>Pakistan</td>
<td>0.0% (Iqbal and Rehan 1996) 0.0% (Kuo et al. 2006) 0.0% (Khawaja et al. 1997) 0.63% (Altaf et al. 2004)</td>
</tr>
</tbody>
</table>
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 intermediate 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 to

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\(^{18}\) Ray Kim, “Global Epidemiology.”


\(^{20}\) Sy and Jamal, “Epidemiology of Hepatitis C Virus (HCV) Infection.”


\(^{23}\) Kuo et al., “High HCV Seroprevalence.”
Characterizing the HIV/AIDS Epidemic in the Middle East and North Africa

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

Table 2.3 provides estimates of the number of IDUs in a number of MENA countries as extracted from a global review of IDU. In another study, Aceijas et al. estimated that there are 0.3 to 0.6 million IDUs in MENA. Further studies estimate that there are 7,500 (400 in Kabul) IDUs in Afghanistan; 400,000 in the Arabic world; 112,000, 137,000, at least 166,000, 200,000, 300,000, and 70,000 in the Islamic Republic of Iran; and 60,000 and 180,000 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.  

Table 2.2 HCV Prevalence among IDUs in MENA

<table>
<thead>
<tr>
<th>Country</th>
<th>Survey results for HCV prevalence among IDUs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>36.6% (Todd et al. 2007)</td>
</tr>
<tr>
<td>Egypt, Arab Republic of</td>
<td>63.0% (Saleh et al. 2000; El-Ghazawi et al. 1995)</td>
</tr>
<tr>
<td>Iran, Islamic Republic of</td>
<td>30.0% (injecting and noninjecting drug users; Alizadeh et al. 2005)</td>
</tr>
<tr>
<td></td>
<td>60.0% (Rahbar, Rooholamin, and Khoshnood 2004)</td>
</tr>
<tr>
<td></td>
<td>54.0% (Semashkoff et al. 2007)</td>
</tr>
<tr>
<td></td>
<td>65.0% (injecting drug users; Khani et al. 2004)</td>
</tr>
<tr>
<td></td>
<td>66.0% (inmates; Weng et al. 2004)</td>
</tr>
<tr>
<td></td>
<td>45.0% (Zali et al. 2001)</td>
</tr>
<tr>
<td></td>
<td>12.0% (Imani et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>14.4% (mainly noninjecting drug users; Talaie et al. 2007)</td>
</tr>
<tr>
<td></td>
<td>25.0% (Altar et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>19.2% (Altar et al. 2009)</td>
</tr>
<tr>
<td>Lebanon</td>
<td>&lt; 20.0% (Aceijas and Rhodes 2007)</td>
</tr>
<tr>
<td></td>
<td>25.0% (HIV infected; Ramia et al. 2004)</td>
</tr>
<tr>
<td></td>
<td>49.0% (Mishwar 2008)</td>
</tr>
<tr>
<td></td>
<td>80.0% (incarcerated IDUs; Kheirandish et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>7.3% (injecting and noninjecting drug users; Mohammad et al. 2003)</td>
</tr>
<tr>
<td>Oman</td>
<td>11%–53% (Oman MOH 2006)</td>
</tr>
<tr>
<td>Pakistan</td>
<td>88.0% (Kuo et al. 2006)</td>
</tr>
<tr>
<td></td>
<td>89.0% (UNODCP and UNAIDS 1999)</td>
</tr>
<tr>
<td></td>
<td>60.0% (Achakzai, Kassi, and Kasi 2007)</td>
</tr>
<tr>
<td></td>
<td>87.0% (Pakistan National AIDS Control Program 2005c)</td>
</tr>
<tr>
<td></td>
<td>91.0% (Pakistan National AIDS Control Program 2005c)</td>
</tr>
<tr>
<td></td>
<td>17.3% (Platt et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>8.0% (Platt et al. 2009)</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>69.0% (Iqbal 2000)</td>
</tr>
<tr>
<td></td>
<td>75.0% (Njoh and Zimmo 1997a)</td>
</tr>
<tr>
<td>Syrian Arab Republic</td>
<td>60.5% (Othman and Monem 2002)</td>
</tr>
<tr>
<td></td>
<td>21.0% (self-reported; 51% of sample are IDUs; Syria Mental Health Directorate 2008)</td>
</tr>
<tr>
<td>Tunisia</td>
<td>39.7% (HIV infected; Kilani et al. 2007)</td>
</tr>
</tbody>
</table>

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25 Mathers et al., “Global Epidemiology.”
26 Ibid.
28 Aceijas et al., “Global Overview.”
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.”
38 Haque et al., “High-Risk Sexual Behaviour.”
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

<table>
<thead>
<tr>
<th>Country</th>
<th>IDU estimates</th>
<th>IDU prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Middle</td>
</tr>
<tr>
<td>Afghanistan</td>
<td>22,720</td>
<td>34,080</td>
</tr>
<tr>
<td>Algeria</td>
<td>6,870</td>
<td>6,900</td>
</tr>
<tr>
<td>Bahrain</td>
<td>26,333</td>
<td>40,961</td>
</tr>
<tr>
<td>Egypt, Arab Republic of</td>
<td>337</td>
<td>674</td>
</tr>
<tr>
<td>Iran, Islamic Republic of</td>
<td>56,970</td>
<td>88,618</td>
</tr>
<tr>
<td>Iraq</td>
<td>70,000</td>
<td>185,000</td>
</tr>
<tr>
<td>Jordan</td>
<td>180,000</td>
<td></td>
</tr>
<tr>
<td>Kuwait</td>
<td>23,115</td>
<td>34,673</td>
</tr>
<tr>
<td>Lebanon</td>
<td>3,200</td>
<td>4,850</td>
</tr>
<tr>
<td>Lebanon</td>
<td>2,700</td>
<td>4,100</td>
</tr>
<tr>
<td>Libya</td>
<td>2,200</td>
<td>3,300</td>
</tr>
<tr>
<td>Libya</td>
<td>4,633</td>
<td>7,206</td>
</tr>
<tr>
<td>Libya</td>
<td>1,685</td>
<td></td>
</tr>
<tr>
<td>Morocco</td>
<td>21,800</td>
<td>42,000</td>
</tr>
<tr>
<td>Oman</td>
<td>2,800</td>
<td>4,250</td>
</tr>
<tr>
<td>Pakistan</td>
<td>54,000</td>
<td>462,000</td>
</tr>
<tr>
<td>Qatar</td>
<td>780</td>
<td>1,190</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>15,172</td>
<td>23,600</td>
</tr>
<tr>
<td>Sudan</td>
<td>24,319</td>
<td>37,828</td>
</tr>
<tr>
<td>Syrian Arab Republic</td>
<td>4,000</td>
<td>6,000</td>
</tr>
<tr>
<td>Tunisia</td>
<td>8,462</td>
<td>13,163</td>
</tr>
<tr>
<td>Turkey</td>
<td>66,591</td>
<td>99,887</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>3,200</td>
<td>4,800</td>
</tr>
<tr>
<td>Yemen, Republic of</td>
<td>12,710</td>
<td>19,770</td>
</tr>
</tbody>
</table>

Sources: Adapted from Aceijas et al. (2006), with more recent estimates from Mathers et al. (2008).
that 6% of respondents reported that they had ever used drugs.\textsuperscript{56} 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 users\textsuperscript{51} (including 900–1,400 heroin users\textsuperscript{52}).

MENA is flooded with inexpensive drugs due to record levels of heroin production in Afghanistan.\textsuperscript{53} Around 92% of the world’s supply of heroin in 2006 came from Afghanistan,\textsuperscript{54} where it is estimated that 2.9% of all arable land is devoted to opium cultivation.\textsuperscript{55} According to the United Nations Office on Drugs and Crime (UNODC),\textsuperscript{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.\textsuperscript{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.\textsuperscript{58} Increases in drug use have been cited in the West Bank and Gaza since 1994, despite its severe isolation.\textsuperscript{59}

Afghanistan, the epicenter of opiate production, has very limited resources to deal with the IDU problem among its population.\textsuperscript{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.\textsuperscript{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.\textsuperscript{62} A study mapping IDU in Pakistan found that only 0.2% of IDUs were females.\textsuperscript{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.\textsuperscript{64} Similarly in the Syrian Arab Republic, 48% of IDUs were familiar with at least one female IDU.\textsuperscript{65} In the 1999 rapid situation assessment (RSA) in the Islamic Republic of Iran, 6.6% of drug users were women.\textsuperscript{66} Another RSA of prisoners estimated that 10%–50% of female inmates had a history of drug use.\textsuperscript{67} The number of female IDUs in the Islamic Republic of Iran has been estimated at 14,000.\textsuperscript{68} There is a perception that drug dependence among Iranian women has been increasing in recent years.\textsuperscript{69} Lastly, in a study of IDUs in Morocco, 16% were females.\textsuperscript{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,
Injecting Drug Users and HIV

Afghanistan reported using nonsterile injecting equipment. Eighty percent of IDUs in Pakistan reported using syringes.

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. 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”), 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.

Changes in drug supply have been associated with increases in IDU in other countries including the Russian Federation, Thailand, and the United States. 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. Half of the IDUs in one district in the Islamic Republic of Iran used nonsterile injecting equipment on a daily basis. There are also reports of group injecting, such as in Pakistan, where, as reported in two studies, 79.5% and 78% of IDUs reported this practice. Forty percent of IDUs in Afghanistan reported receiving injections by a “street doctor” in the past six months.

This practice is associated with higher reuse of injecting equipment. 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. 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. 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. Almost one-third of IDUs in Afghanistan reported using nonsterile injecting equipment.

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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.”
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”;
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>
<thead>
<tr>
<th>Country</th>
<th>Survey results for use of nonsterile needles or syringes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>50.0% (UNAIDS 2008)</td>
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<tr>
<td></td>
<td>50.4% (Todd et al. 2007)</td>
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<td></td>
<td>46.0% (World Bank 2008)</td>
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<td>Algeria</td>
<td>41.0% (Mimouni and Remaoun 2006)</td>
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<tr>
<td>Egypt, Arab Republic of</td>
<td>32.2% (Egypt MOH and Population National AIDS Program 2006)</td>
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<tr>
<td></td>
<td>11.0% (Salama et al. 1998)</td>
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<tr>
<td></td>
<td>59.0% (UNAIDS 2008)</td>
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<td></td>
<td>55.0% (Elshimi, Warner-Smith, and Aon 2004)</td>
</tr>
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<td>Iran, Islamic Republic of</td>
<td>67.0% (Day et al. 2006)</td>
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<tr>
<td></td>
<td>49.8% (Razzaghi, Rahimi, and Hosseini 1999)</td>
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<td>24.8% (Razzaghi, Rahimi, and Hosseini 1999)</td>
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<td></td>
<td>48.3% (Zamani et al. 2006)</td>
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<td>11.0% (Zamani et al. 2006)</td>
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<td></td>
<td>30.6% (Zamani et al. 2005)</td>
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<td></td>
<td>30%–100% (Razzaghi et al. 2006)</td>
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<td></td>
<td>39.9% (Zamani et al. 2008)</td>
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<td></td>
<td>35.2%–48.6% (Farhoudi et al. 2003)</td>
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<td></td>
<td>73.0% (Mojahedzadeh et al. 2008)</td>
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<td>26.6% (Kheirandish et al. 2009)</td>
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<tr>
<td>Lebanon</td>
<td>33.0% (Ingold 1994)</td>
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<td>42.0% (Aaraj [unknown])</td>
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<td></td>
<td>40.0% (Jenkins and Robalino 2003)</td>
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<td></td>
<td>64.7% (Hermez [unknown]) (Aaraj [unknown])</td>
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<td></td>
<td>34.2% (Mishwar 2008)</td>
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<td>17.0% (Mishwar 2008)</td>
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<td></td>
<td>34.2% (Mishwar 2008)</td>
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<tr>
<td>Libya</td>
<td>44.0% (UNAIDS 2008)</td>
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<tr>
<td>Morocco</td>
<td>47.0% (UNAIDS 2008)</td>
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<tr>
<td></td>
<td>72.6% (Asouab 2005; Morocco MOH 2007)</td>
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<tr>
<td>Oman</td>
<td>44%–70% (different groups of IDUs; Oman MOH 2006)</td>
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<tr>
<td>Pakistan</td>
<td>56.8% (Ahmed et al. 2003)</td>
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<td>56.0% (Ahmed et al. 2003)</td>
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<td></td>
<td>76.0% (Strathdee et al. 2003)</td>
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<td>52.0% (Baqi et al. 1998)</td>
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<td>47.0% (Parviz et al. 2006)</td>
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<td>48.2% (Zafar et al. 2003)</td>
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<td></td>
<td>58.7% (Emmanuel et al. 2004)</td>
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<td></td>
<td>82.0% (Pakistan National AIDS Control Program 2005b)</td>
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<td></td>
<td>23.0% (Pakistan National AIDS Control Program 2005c)</td>
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<tr>
<td></td>
<td>78.1% (Emmanuel and Fatima 2008)</td>
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<td></td>
<td>18.0% (Bokhari et al. 2007)</td>
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<tr>
<td></td>
<td>48.0% (Pakistan National AIDS Control Program 2005c)</td>
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<tr>
<td></td>
<td>82.0% (Pakistan National AIDS Control Program 2005c)</td>
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<tr>
<td></td>
<td>72.2% (Afghan refugees; Zafar et al. 2003)</td>
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<td></td>
<td>25.2% (Saleem, Adrien, and Razaque 2008)</td>
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<tr>
<td></td>
<td>47.1% (Pakistan National AIDS Control Program 2005a)</td>
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<tr>
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<td>21.9% (Pakistan National AIDS Control Program 2006–07)</td>
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<td></td>
<td>17.6% (Pakistan National AIDS Control Program 2008)</td>
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<td>8.5% (Altarf et al. 2008)</td>
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<td>33.6% (Altarf et al. 2009)</td>
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<td>41.0% (Platt et al. 2009)</td>
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<td></td>
<td>14.0% (Platt et al. 2009)</td>
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<tr>
<td>Syrian Arab Republic</td>
<td>47.0% (UNAIDS 2008)</td>
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<td></td>
<td>28.0% (Syria Mental Health Directorate 2008)</td>
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</tbody>
</table>
reported a daily injection. Also in Pakistan, studies found that IDUs reported a mean of 2.93, 2.3, 2.3, 2.2, 2.6, 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

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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 Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round I).
99 Neaigus et al., “The Relevance of Drug Injectors.”
100 Razzaghi et al., “Profiles of Risk.”
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.”
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 IDUs 127 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.”
129 Zamani et al., “Prevalence of and Factors Associated with HIV-1 Infection.”
130 Zamani et al., “Prevalence and Correlates of Hepatitis C Virus.”
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.”
141 Razzaghi, Rahimi, and Hosseini, Rapid Situation Assessment.
142 Zamani et al., “High Prevalence of HIV Infection.”
143 Rahbar, Rooholamini, and Khoshnoosh, “Prevalence of HIV Infection.”
144 Tehrani and Malek-Afzalip, “Knowledge, Attitudes and Practices.”
145 Narenjiha et al., “Rapid Situation Assessment.”
149 Oman MOH, “HIV Risk.”
partner, and 42%–62% reported having sex with a woman in the last year. Also in Pakistan, individual studies reported that 42.2%, 45.7%, and 37.8% 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%, 54.1%, and 40% for IDUs. Seven percent of those arrested for drug-related crimes were found positive for syphilis (a sexually transmitted infection [STI]). In Syria, IDUs had a mean number of seven sexual partners over the last 12 months.

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

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”). This procedure was associated with a sevenfold higher chance of HCV infection, attesting to the danger of this practice for HIV transmission. There is also documented evidence of the commercial sale of blood among IDUs. In a number of studies in Pakistan, 52%, 22%, 30%, 28%, 27%, and 3% of IDUs reported giving blood for profit. This practice led to a large number of HIV infections in China through contaminated blood. Private clinics in Pakistan are known to provide monetary reimbursement for blood donation, thereby creating an incentive for IDUs to give blood. 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.

KNOWLEDGE OF HIV/AIDS

Levels of HIV/AIDS knowledge among IDUs in MENA appear to be variable. Only 40% of IDUs in Afghanistan and 18.3% of Afghani IDUs in Pakistan 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. However, almost all IDUs in a different study in Egypt were aware of HIV and some of its transmission modes, but still had...
### Table 2.5 Measures of Overlapping Injecting and Sexual Risk Behaviors of IDUs in MENA

<table>
<thead>
<tr>
<th>Country</th>
<th>Paying for sex and contacting commercial sex workers</th>
<th>Engagement in sex work for drugs or money</th>
<th>Having sex with a man or a boy</th>
<th>Condom use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>69.0% (World Bank 2006) 76.2% (Todd et al. 2007) 48.0% (World Bank 2008)</td>
<td>32.0% (World Bank 2006) 8.3% (Todd et al. 2007) 21.0% (World Bank 2008)</td>
<td>0.0% (ever use; Sanders-Buell et al. 2007) 17.0% (ever use; commercial sex; World Bank 2008)</td>
<td></td>
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<tr>
<td>Algeria</td>
<td>40.0% (Mimouni and Remaoun 2006) 44.0% (Algeria MOH [unknown])</td>
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<tr>
<td>Egypt, Arab Republic of</td>
<td>13.3% (Egypt MOH and Population National AIDS Program 2006)</td>
<td>9.4% (Egypt MOH and Population National AIDS Program 2006)</td>
<td>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)</td>
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</tr>
<tr>
<td>Iran, Islamic Republic of</td>
<td>23.0% (Narenjiha et al. 2005) 9.2%–14.9% (IDU prisoners; Farhoudi et al. 2003) 23.3% (Kheirandish et al. 2009)</td>
<td>28.6% (last month; Eftekhari et al. 2008) 30.0% (Raztaghi, 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)</td>
<td>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)</td>
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</tr>
<tr>
<td>Lebanon</td>
<td>47.1% (Mishwar 2008) 32.9% (last month; Hermez [unknown]; Aaraj [unknown])</td>
<td>33.0% (UNAIDS 2008) 27.1% (Hermez [unknown]; Aaraj [unknown]) 17.0% (Mishwar 2008)</td>
<td>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])</td>
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<tr>
<td>Oman</td>
<td>60%–97% (Oman MOH 2006)</td>
<td>12%–25% (always; Oman MOH 2006)</td>
<td>53%–65% (ever use; Oman MOH 2006) 12%–25% (always; Oman MOH 2006)</td>
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Table 2.5 (Continued)

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<thead>
<tr>
<th>Country</th>
<th>Paying for sex and contacting commercial sex workers</th>
<th>Engagement in sex work for drugs or money</th>
<th>Having sex with a man or a boy</th>
<th>Condom use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pakistan</td>
<td>68.9% (Kuo et al. 2006)</td>
<td>5.5% (Emmanuel et al. 2004)</td>
<td>37.4% (Kuo et al. 2006)</td>
<td>40.0% (ever use; Emmanuel and Fatima 2008)</td>
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<td></td>
<td>50.4% (Kuo et al. 2006)</td>
<td>14%–20% (Pakistan National AIDS Control Program 2005b)</td>
<td>14.0% (Haque et al. 2004)</td>
<td>37.5% (ever use; Kuo et al. 2006)</td>
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<td>58.3% (Altaf et al. 2007)</td>
<td>5.3% (Emmanuel and Fatima 2008)</td>
<td>10.9% (Emmanuel et al. 2004)</td>
<td>14.2% (ever use; Kuo et al. 2006)</td>
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<td></td>
<td>49.0% (Haque et al. 2004)</td>
<td>5%–11% (Bokhari et al. 2007)</td>
<td>14.7% (Emmanuel and Fatima 2008)</td>
<td>7.0% (ever use; Parviz et al. 2006)</td>
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<td></td>
<td>42.9% (Strathdee et al. 2003)</td>
<td>19.6% (Pakistan National AIDS Control Program 2006–07)</td>
<td>14.0% (Bokhari et al. 2007)</td>
<td>34.0% (ever use; Altaf et al. 2007)</td>
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<td></td>
<td>20.8% (Emmanuel et al. 2004)</td>
<td>16.8% (Pakistan National AIDS Control Program 2008)</td>
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<td>10.0% (ever use; Haque et al. 2004)</td>
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<td></td>
<td>41.0% (Afghani refugees; Zafar et al. 2003)</td>
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<td>17%–32% (last sex; FSW; Bokhari et al. 2007)</td>
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<td></td>
<td>13%–28% (Pakistan National AIDS Control Program 2005b)</td>
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<td>10%–25% (last sex; sex work; Bokhari et al. 2007)</td>
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<td></td>
<td>12.6% (Emmanuel and Fatima 2008)</td>
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<td>7%–13% (last sex; commercial sex; Bokhari et al. 2007)</td>
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<td></td>
<td>30%–34% (Bokhari et al. 2007)</td>
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<td></td>
<td>46%–66% (not used last six months; nonpaid partners; Pakistan National AIDS Control Program 2005b)</td>
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<td></td>
<td>18%–23% (with MSWs; Bokhari et al. 2007)</td>
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<td>49%–86% (not used last six months; commercial sex; Pakistan National AIDS Control Program 2005b)</td>
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<td></td>
<td>8%–27% (with MSWs; Pakistan National AIDS Control Program 2005b)</td>
<td></td>
<td></td>
<td>25.0% (last sex; regular partner; Pakistan National AIDS Control Program 2005a)</td>
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<td></td>
<td>3.3% (with hijra; Emmanuel et al. 2004)</td>
<td></td>
<td></td>
<td>16.5% (last sex; regular partner; Pakistan National AIDS Control Program 2006–07)</td>
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<tr>
<td></td>
<td>26.6% (Pakistan National AIDS Control Program 2005a)</td>
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<td>33.5% (last sex; regular partner; Pakistan National AIDS Control Program 2008)</td>
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<td>20.9% (last sex; FSW; Pakistan National AIDS Control Program 2006–07)</td>
</tr>
<tr>
<td></td>
<td>13.2% (with MSW or hijra; Pakistan National AIDS Control Program 2005a)</td>
<td></td>
<td></td>
<td>31.0% (last sex; FSW; Pakistan National AIDS Control Program 2008)</td>
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<tr>
<td></td>
<td>14.7% (with MSW or hijra; Pakistan National AIDS Control Program 2006–07)</td>
<td></td>
<td></td>
<td>12.5% (last sex; man or hijra; Pakistan National AIDS Control Program 2005a)</td>
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<tr>
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<td>13.9% (with MSW or hijra; Pakistan National AIDS Control Program 2008)</td>
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<td>12.9% (last sex; MSW or hijra; Pakistan National AIDS Control Program 2006–07)</td>
</tr>
<tr>
<td></td>
<td>24.0% (Platt et al. 2009)</td>
<td></td>
<td></td>
<td>13.8% (last sex; MSW or hijra; Pakistan National AIDS Control Program 2008)</td>
</tr>
<tr>
<td></td>
<td>21.0% (Platt et al. 2009)</td>
<td></td>
<td></td>
<td>45.0% (last sex; Platt et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>14.0% (with a transgendered person; Platt et al. 2009)</td>
<td></td>
<td></td>
<td>32.0% (last sex; Platt et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>2.0% (with a transgendered person; Platt et al. 2009)</td>
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</tr>
</tbody>
</table>

(continued)
several misconceptions. 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%). 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%, 31.1%, and 35.9% of IDUs in Pakistan and 27% of IDUs in Syria reported feeling at risk of HIV infection. A more comprehensive study of HIV/AIDS knowledge in MENA can be found in chapter 7.

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.

BIBLIOGRAPHY


Characterizing the HIV/AIDS Epidemic in the Middle East and North Africa

and HIV-1 Spread in South and South-East Asia.” AIDS 14: 75–83.


——. Unknown. “Situation épidémiologique actuelle du VIH/SIDA au Maroc.”


Characterizing the HIV/AIDS Epidemic in the Middle East and North Africa


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. Table 3.1 describes the results of available point-prevalence surveys for MSM, including male sex workers (MSWs), hijras, transgender individuals, 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%. 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. 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.

**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. Homosexual identities existed throughout Arab and Islamic history and are well described, including celebrated historical figures. Arab and Islamic cultures treated homosexuals for much of history largely with indifference. 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.

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Table 3.1 HIV Prevalence among MSM in MENA

<table>
<thead>
<tr>
<th>Country</th>
<th>HIV prevalence among MSM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt, Arab Republic of</td>
<td>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)</td>
</tr>
<tr>
<td>Lebanon</td>
<td>3.6% (Mishwar 2008)</td>
</tr>
<tr>
<td>Morocco</td>
<td>4.4% (Alami 2009)</td>
</tr>
<tr>
<td>Pakistan</td>
<td>3.9% (MSWs; Bokhari et al. 2007)</td>
</tr>
<tr>
<td></td>
<td>0.0% (MSWs; Bokhari et al. 2007)</td>
</tr>
<tr>
<td></td>
<td>4.0% (MSWs; Bokhari et al. 2007)</td>
</tr>
<tr>
<td></td>
<td>0.4% (average of different cities with a range of 0–4.0; MSWs; Pakistan National AIDS Control Program 2005)</td>
</tr>
<tr>
<td></td>
<td>1.5% (average of different cities with a range of 0–7.5; MSWs; Pakistan National AIDS Control Program 2006–07)</td>
</tr>
<tr>
<td></td>
<td>0.9% (average of different cities with a range of 0–3.1; MSWs; Pakistan National AIDS Control Program 2008)</td>
</tr>
<tr>
<td></td>
<td>0.8% (average of different cities with a range of 0–1.6; HSWs; Pakistan National AIDS Control Program 2005)</td>
</tr>
<tr>
<td></td>
<td>1.8% (average of different cities with a range of 0–14.0; HSWs; Pakistan National AIDS Control Program 2006–07)</td>
</tr>
<tr>
<td></td>
<td>6.4% (average of different cities with a range of 0–27.6; HSWs; Pakistan National AIDS Control Program 2008)</td>
</tr>
<tr>
<td></td>
<td>1.5% (hijras; Bokhari et al. 2007)</td>
</tr>
<tr>
<td></td>
<td>0.5% (hijras; Bokhari et al. 2007)</td>
</tr>
<tr>
<td></td>
<td>0.0% (hijras; Baqi et al. 1999)</td>
</tr>
<tr>
<td></td>
<td>1.0% (hijras; Khan, A. A. et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>0.5% (MSWs; banthas(^a); Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>0.0% (MSWs; banthas; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>0.0% (MSWs; khotkis(^b); Rawalpindi; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>0.0% (MSWs; khotkis; Abbottabad; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>2.5% (MSWs; khusras(^c); Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>0.0% (MSWs; khusras; Hawkes et al. 2009)</td>
</tr>
<tr>
<td>Sudan</td>
<td>9.3% (Elrashied 2006)</td>
</tr>
</tbody>
</table>

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

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\(^{11}\) Abukhalil, “Gender Boundaries and Sexual Categories in the Arab World.”

\(^{12}\) Ibid.

\(^{13}\) 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.”
homosexual relationships. 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.

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.

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. In Lebanon, 8.4% of prisoners reported anal sex with a man in prison. 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. In Pakistan, 11.3% of truck drivers reported ever having sex with an MSW, and 49.3% reported ever having sex with a man. In another study, 21.9% of truck drivers had sex with a male or hijra. Among truck drivers attending an STD (sexually transmitted disease) clinic, 53% reported anal sex with males. Among prisoners, 26% reported sexual relations with other males prior to incarceration, and among migrants, 1.7% reported ever having sex with a man. History of urethritis and genital ulcer disease among male prisoners was associated with same-sex anal sex.

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

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. 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.

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.

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 Ershad, “Generating Strategic Information.”
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.”
26 Baqai et al., “HIV Antibody Seroprevalence.”
27 Faisel 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 Al-Serouri, “Assessment of Knowledge.”
33 Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round I).
34 Ibid.
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, with 82% of MSM being insertive and 51% being receptive. 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. Sixty-seven percent of MSM reported having five concurrent sexual partners, and 80.8% had ever had sex with multiple partners per act. Being forced by their partners to practice anal sex in the last year was reported by 6.3% of MSM.

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. Forty-six percent reported six or more sexual partnerships in the last six months, and 9.93% reported only one kind of sexual partnership. The partners were described as steady in 61.2% of the cases, sex workers in 53.8%, and casual in 82.2%. Being victimized in coercive sex was reported by 47.8% of MSM. 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.

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. On average, MSM reported 9.47 partners in the past 12 months. In Oman, MSM injecting drug users (IDUs) reported a mean number of two sexual partners. In Sudan, 97.2% of MSM reported more than one concurrent partner, and receptive MSM reported a mean of eight noncommercial partners in the last six months. In addition to anal sex, 57.2% of MSM in Sudan reported engaging in oral sex, with virtually all doing so without condoms. In Tunisia, 90.1% of MSM reported multiple anal sex partners in the last six months and 12% paid for sex with MSWs. 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.

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. Commercial sex among MSM was reported by various studies as 42% and 20% in Egypt, 36% in Lebanon, and 67% and 75.5% 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. In studies in Pakistan, MSWs reported an average of 2.3, 2.1, and 1.9 clients per working day, and an average of

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37 El-Sayed et al., “Evaluation of Selected Reproductive Health Infections.”
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 Etiekhar et al., “Bio-Behavioural Survey.”
44 Ibid.
45 Ibid.
46 Ibid.
47 Ibid.
48 Ibid.
49 Ibid.
51 Ibid.
52 Hsairi and Ben Abdallah, “Analyse de la situation de vulnérabilité.”
53 Khan and Hyder, “HIV/AIDS among Men Who Have Sex with Men.”
54 International HIV/AIDS Alliance, “Spreading the Word.”
56 El-Sayed et al., “Knowledge, Attitude, and Practice.”
57 Ibid.
58 Ibid.
59 Ibid.
60 Ibid.
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, 25.8, and 20.3 clients per month. In these same studies, HSWs reported an average of 2.5, 2.5, and 2.59 clients per working day, and an average of 36.3, 32.0, and 49.0 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. The mean number of years in sex work was reported to be between 6.7 and 12.5 years. Hijras constitute about one-quarter of all male sex workers in Pakistan. Their clients are reported to be businessmen, drivers, students, police/military, rickshaw drivers, and the unemployed.

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. Payment to anyone for anal sex was reported in several studies by 20%, 10%, and 4.5% of MSWs; 21.1% of HSWs; and 15% of hijras. Noncommercial partners in the last month were reported in studies by 37.7%, 34.6%, and 31.8% of MSWs; 21.1%, 32.9%, and 44.0% of HSWs; and 40% of hijras. Close to half of the MSWs and HSWs used alcohol or drugs during sex in the last six months or in the last month. Hijras performed oral sex with 39% of their one-time clients and 42% of their regular clients. Selling blood for money in the last six months was reported by 2.4% of MSWs and 1.6% of HSWs.

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. 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. Hijras reported four partners in the last week, and 95% of HSWs have had sex with other hijras. Seventeen percent to 19% of MSWs reported selling blood for profit. Most hijras (84%) in one study were found to have engaged in sex work within the last month and 99% within the last year. 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).
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. 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. Seventy-one percent of MSM reported a commercial sex partner in the last six months. 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.

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 (maseurs). Close to half of MSWs and HSWs were illiterate. 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. Between 10% and 18% of these MSWs and HSWs reported that their first sex was forced.

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 condoms; 2%, 19%, and 19.2% used condoms consistently; and 9.2% used condoms during last commercial sex. Twenty-two percent of MSM in Egypt reported difficulty in obtaining condoms and 38% reported difficulty using them, but three quarters of MSM had heard of male condoms. 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. In Lebanon, two studies found that 47.1% and 54.5% of MSM always used condoms with regular partners and noncommercial casual partners, respectively. In Oman, 68%-100% of different groups of MSM IDUs used condoms in the last year.

In Pakistan, condom use during last anal sex with a client was reported by 24% of MSWs and 21% of HSWs. Condom use during last oral sex with a client was reported by 13% of MSWs and 15% of HSWs. Among MSWs, 34.7% reported condom use at last sex with a paying client and 32.5% with a nonpaying partner. For HSWs, the percentages were 32.3 and 26, respectively. Studies reported consistent condom use in the last month by 7.2% and 8% of MSWs, and 5.6% and 7.5% of HSWs. In further studies, 4% of hijras and 3.1% of MSWs used condoms consistently, and 17% of MSWs used a condom with a nonpaying female in the last month. 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.
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 noncommercial 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. 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. In Egypt, 46.4% of MSM used condoms during last nonpaid sex; 19.7% of MSM used condoms consistently during nonpaid sex; 53.7% of MSM used condoms consistently during sex with females; 55.4% of MSM used condoms during last paid sex; and 43.3% used condoms consistently during paid anal sex. 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 years and 29.3% of younger MSM. Forty-four percent reported having sex with females. In Tunisia, 46.4% of MSM used condoms during last nonpaid sex; 19.7% of MSM used condoms consistently during nonpaid sex; 53.7% of MSM used condoms consistently during sex with females; 55.4% of MSM used condoms during last paid sex; and 43.3% used condoms consistently during paid anal sex. 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 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. 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. Studies in Pakistan reported that 4%–17% and 1%–2% of hijras and 7%–9% and 4%–6% of MSWs injected drugs. Also in Pakistan, studies reported that 5%, 5.2%, and 4.2% of MSWs and 5.3%, 6.3%, and 4.6% of HSWs injected drugs in the last six months. Further reported by these studies, 10.1%, 9.5%, and 4.2% of MSWs and 8.4%, 6.4, 6.3% 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. In Sudan, 24.4% of MSM used drugs. In Tunisia, 14.7% of MSM reported IDU within the last year.

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. 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. 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. 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. Separate studies in Pakistan found that 72.1%, 63.5%, and 62.1% of MSWs perceived no risk of HIV infection. Among HSWs, the percentages were 83.7, 77.8, and 59.2. In Sudan, 98.3% of MSM have heard of HIV/AIDS, but misconceptions were prevalent. Some MSM harbored the belief that keeping to an insertive role

164 Eftekhar et al., “Bio-Behavioral 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).
172 Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round I).
173 Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round II).
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 Elrashied, “Generating Strategic Information.”
182 Ibid.
185 Eftekhar et al., “Bio-Behavioral Survey.”
186 Ibid.
188 Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round II).
189 Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round III).
190 Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round I).
191 Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round II).
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.\textsuperscript{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.

\textsuperscript{196} Elrashied, “Generating Strategic Information.”

**BIBLIOGRAPHY**


Characterizing the HIV/AIDS Epidemic in the Middle East and North Africa


Ministry of Health and Medical Education of Iran. 2006. “Treatment and Medical Education.” Islamic Republic of Iran HIV/AIDS situation and response analysis.


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).\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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, and it must be understood in terms of livelihood and gender perspective.\textsuperscript{5} 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.\textsuperscript{6} 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.\textsuperscript{7}

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\textsuperscript{1} Male sex workers (MSWs) are included among MSM.

\textsuperscript{2} Morison et al., “Commercial Sex and the Spread of HIV.”

\textsuperscript{3} Alrajhi, Halim, and Al-Abdely, “Mode of Transmission of HIV-1.”

\textsuperscript{4} McCarthy, Khalid, and El Tigani, “HIV-1 Infection in Juba, Southern Sudan.”

\textsuperscript{5} ACORD, “Socio Economic Research.”

\textsuperscript{6} ACORD, “Qualitative Socio Economic Research.”

\textsuperscript{7} Ati, “HIV/AIDS/STIs Social and Geographical Mapping”; ACORD, “Qualitative Socio Economic Research.”

### Table 4.1 HIV Prevalence among FSWs in MENA

<table>
<thead>
<tr>
<th>Country</th>
<th>HIV prevalence among FSWs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>0.0% (World Bank 2008)</td>
</tr>
<tr>
<td>Algeria</td>
<td>1.7% (Fares et al. 2004; Institut de Formation Paramédicale de Parnet 2004)</td>
</tr>
<tr>
<td></td>
<td>2.0% (Fares et al. 2004)</td>
</tr>
<tr>
<td></td>
<td>9.0% (Fares et al. 2004)</td>
</tr>
<tr>
<td></td>
<td>10.0% (Unknown, “Statut de la réponse nationale”)</td>
</tr>
<tr>
<td></td>
<td>3.0% (Algeria MOH [unknown])</td>
</tr>
<tr>
<td></td>
<td>4.0% (Algeria MOH [unknown])</td>
</tr>
<tr>
<td></td>
<td>2.8% (Alami 2009)</td>
</tr>
<tr>
<td></td>
<td>3.7% (Alami 2009)</td>
</tr>
<tr>
<td></td>
<td>3.9% (Alami 2009)</td>
</tr>
<tr>
<td></td>
<td>6.9% (Alami 2009)</td>
</tr>
<tr>
<td></td>
<td>10.7% (Alami 2009)</td>
</tr>
<tr>
<td></td>
<td>10.0% (Alami 2009)</td>
</tr>
<tr>
<td>Djibouti</td>
<td>3.9% (street-based; Etchepare 2001)</td>
</tr>
<tr>
<td></td>
<td>9.0% (street-based; Etchepare 2001)</td>
</tr>
<tr>
<td></td>
<td>41.4% (street-based; Etchepare 2001)</td>
</tr>
<tr>
<td></td>
<td>39.5% (street-based; Etchepare 2001)</td>
</tr>
<tr>
<td></td>
<td>51.3% (street-based; Etchepare 2001)</td>
</tr>
<tr>
<td></td>
<td>55.8% (street-based; Etchepare 2001)</td>
</tr>
<tr>
<td></td>
<td>&gt;50.0% (street-based; Etchepare 2001)</td>
</tr>
<tr>
<td></td>
<td>2.0% (Fox et al. 1989)</td>
</tr>
<tr>
<td></td>
<td>4.6% (street-based; Rodier et al. 1993)</td>
</tr>
<tr>
<td></td>
<td>41.7% (street-based; Rodier et al. 1993)</td>
</tr>
<tr>
<td></td>
<td>41.0% (street-based; Rodier et al. 1993)</td>
</tr>
<tr>
<td></td>
<td>36.0% (street-based; Rodier et al. 1993)</td>
</tr>
<tr>
<td></td>
<td>70.0% (street-based; Marcelin et al. 2001; Marcelin et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>1.4% (bar-based; Etchepare 2001)</td>
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<tr>
<td></td>
<td>2.7% (bar-based; Etchepare 2001)</td>
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<tr>
<td></td>
<td>5.0% (bar-based; Etchepare 2001)</td>
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<tr>
<td></td>
<td>7.0% (bar-based; Marcelin et al. 2001; Marcelin et al. 2002)</td>
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<tr>
<td></td>
<td>14.2% (bar-based; Etchepare 2001)</td>
</tr>
<tr>
<td></td>
<td>15.3% (bar-based; Rodier et al. 1993)</td>
</tr>
<tr>
<td></td>
<td>21.7% (bar-based; Etchepare 2001)</td>
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<tr>
<td></td>
<td>25.6% (bar-based; Etchepare 2001)</td>
</tr>
<tr>
<td></td>
<td>≥50% (Philippon et al. 1997)</td>
</tr>
<tr>
<td>Egypt, Arab Republic of</td>
<td>0.8% (Egypt MOH and Population National AIDS Program 2006)</td>
</tr>
<tr>
<td></td>
<td>0.0% (Watts et al. 1993)</td>
</tr>
<tr>
<td>Iran, Islamic Republic of</td>
<td>0.0% (Jahani et al. 2005)</td>
</tr>
<tr>
<td></td>
<td>0.0% (Tassie [unknown])</td>
</tr>
<tr>
<td></td>
<td>2.67% (WHO/EMRO Regional Database on HIV/AIDS)</td>
</tr>
<tr>
<td>Lebanon</td>
<td>0.0% (Mishwar 2008)</td>
</tr>
<tr>
<td>Morocco</td>
<td>1.4% (WHO/EMRO Regional Database on HIV/AIDS)</td>
</tr>
<tr>
<td></td>
<td>2.3% (Morocco MOH 2003–04, 2005; Khattabi and Alami 2005)</td>
</tr>
<tr>
<td></td>
<td>3.14% (Khattabi and Alami 2005)</td>
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<tr>
<td></td>
<td>2.03% (Khattabi and Alami 2005)</td>
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<tr>
<td></td>
<td>2.95% (Khattabi and Alami 2005)</td>
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<tr>
<td></td>
<td>2.52% (Khattabi and Alami 2005)</td>
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<tr>
<td></td>
<td>2.36% (Khattabi and Alami 2005)</td>
</tr>
<tr>
<td></td>
<td>0.9% (female prisoners imprisoned for sex work; Khattabi and Alami 2005)</td>
</tr>
<tr>
<td></td>
<td>0.0% (female prisoners imprisoned for sex work; Morocco MOH 2007)</td>
</tr>
<tr>
<td></td>
<td>4.41% (Khattabi and Alami 2005)</td>
</tr>
<tr>
<td></td>
<td>0.0% (Khattabi and Alami 2005)</td>
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<tr>
<td></td>
<td>1.95% (Khattabi and Alami 2005)</td>
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<tr>
<td></td>
<td>2.1% (Alami 2009)</td>
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<tr>
<td></td>
<td>0.33% (Morocco MOH 2007)</td>
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<tr>
<td></td>
<td>0.0% (Morocco MOH 2007)</td>
</tr>
</tbody>
</table>
Table 4.1 (Continued)

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

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 survival 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

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15 Soins Infirmiers et Developpement Communautaire, “Mapping for FSW and IDU Report.”
FSWs in MENA often report high levels of sexual violence and abuse. The abuse takes different forms including verbal, physical, sexual, or being pimped against their will. The perpetrators of the abuse are often clients, husbands, lovers, and neighbors as well as the police and other state actors. 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. Five percent of these FSWs reported that their first sex was forced.

Political conflicts and social and economic inequalities also fuel sexual exploitation and trafficking of women across national boundaries. 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. 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.

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. 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. 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.

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. It is taking place at different venues including homes, hotels, nightclubs, streets, brothels, Gharana (“grand houses”), client homes, massage parlors, “pimp”-run or individually run permanent houses, “red flats,” beaches, rental houses near army bases and market places, truck stops, and in bazaars.

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. It takes a variety of forms, including that of street children and runaway adolescents controlled by older adults; high-class mobile FSWs; mobile-phone networks; “call girls”;

26 Ibid.
28 Kohtakana 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.”
31 El-Gawhary, Sex Tourism in Cairo
32 Štulhofer and Božicevic, “HIV Bio-Behavioural Survey.”
34 Štulhofer and Božicevic, “HIV Bio-Behavioural Survey.”
35 World Bank, “Mapping and Situation Assessment.”
38 Ibid.
39 Busulwa, “HIV/AIDS Situation Analysis Study.”
40 Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round II).
sex work covered under other professions; arrangement for clients through pimps/auntys; reliance on older clients; solicitation of sex at truck stops; FSWs accompanying truck drivers for a whole trip; 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. Increasingly mobile phones are used to facilitate sex work, such as through female brokers in the Arab Republic of Egypt, or simply by direct phone contacts with clients such as in Pakistan. This is leading to a larger dispersion of the FSW population into the community.

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. Sex workers are never a negligible part of the total population of a community.

It is estimated that there are 30,000 to 60,000 FSWs in the Islamic Republic of Iran. It is also estimated that there are 5,000 FSWs in the Republic of Yemen, and 1,500 street-based FSWs in Djibouti. 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.

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. In a study among hospital attendees in Morocco, 0.5% reported engaging in sex work. 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. In Sudan, 1.4% of females in a mainly rural population reported engaging in commercial sex. Also in Sudan, exchanging sex for money was reported by 0.5% of antenatal clinic (ANC) women attendees and 1% of tea sellers.

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% and 0.9%, 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.

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.
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. 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. In Afghanistan, 39% of truck drivers reported having access to FSWs and 7% have had sex with FSWs in the last 12 months. 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 drivers and 34.7% of migrant workers reported contacts with FSWs.

In Somalia, 48% of a group of healthy men reported contacts with FSWs. 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. In Sudan, 3.1% of mainly rural populations in six states, 7.6% of prisoners, 71% of a group of truck drivers and prisoners, and 57% of a group of soldiers, truck drivers, outpatients, and Ethiopian refugees reported contacts with FSWs. Also in Sudan, 11.7% of military personnel, 8.1% of truck drivers, and 8.6% of prisoners reported paying for sex. Among STD clinic attendees, 49.3% acquired their STD from sex workers. 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.

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. 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.

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. In Afghanistan, FSWs reported an average of 13.1 clients per month in one study, and 84% of them reported having one or two clients per working day, with 14% reporting three clients daily. In the Islamic Republic of Iran, it is estimated that FSWs have five to nine customers per week.
with another report indicating an average of nine customers per week.\textsuperscript{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.\textsuperscript{89} Almost all FSWs (97\%) in another study had more than five clients within the last month.\textsuperscript{90} Also in Lebanon, most FSWs reported three to seven clients each week.\textsuperscript{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.\textsuperscript{92} The median number of clients per week in another study was three one-time clients and four regular clients.\textsuperscript{93} In further studies from Pakistan, FSWs reported 4.5,\textsuperscript{94} 4.6,\textsuperscript{95} and 2.6\textsuperscript{96} clients per workday and 31.6,\textsuperscript{97} 36,\textsuperscript{98} 33.1,\textsuperscript{99} and 23\textsuperscript{100} clients per month. Young FSWs were found to have the highest client volume.\textsuperscript{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.\textsuperscript{102} This suggests that the number of new clients is relatively low, with many FSWs servicing a few regular clients.\textsuperscript{103} The mean number of years in sex work was reported to be 13.9 years.\textsuperscript{104}

In Sudan, more than half of FSWs reported more than two clients per day in Khartoum State,\textsuperscript{105} and an average of four clients per week was reported in the Red Sea State.\textsuperscript{106} The demand for sex work was found to rise during holidays, festivals, and at the end of the month.\textsuperscript{107} In Southern Sudan, FSWs reported about two clients per day.\textsuperscript{108} In the Syrian Arab Republic, 86.8\% of FSWs reported one to three clients per day.\textsuperscript{109} FSWs often report sexual activity with other sexual partners beyond sex work such as 53.8\%\textsuperscript{110} and 43.2\%\textsuperscript{111} in two studies of FSWs in Pakistan, and 57\%\textsuperscript{112} in a study in Syria.

Alcohol consumption is associated with higher sexual risk behavior and HIV infection,\textsuperscript{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\%\textsuperscript{114} and 28.2\%\textsuperscript{115} of FSWs reported taking alcohol or drugs in the context of sex work in the last six months.

\section*{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.\textsuperscript{116} This pattern appears to hold true in Lebanon as well, where FSWs have limited interaction among themselves due to intense competition.\textsuperscript{117} In Southern Sudan, 92.8\% of FSWs were working individually and not through mediators or organized sex work.\textsuperscript{118} Understanding the network structure of sex workers and their clients is important in understanding the transmission patterns of HIV.

\textsuperscript{88} Ministry of Health and Medical Education of Iran, “Treatment and Medical Education.”
\textsuperscript{89} Hermez et al., “HIV/AIDS Prevention among Vulnerable Groups.”
\textsuperscript{90} Mishwar, “An Integrated Bio-Behavioral Surveillance Study.”
\textsuperscript{91} Rady, “Knowledge, Attitudes and Prevalence of Condom Use.”
\textsuperscript{92} Pakistan National AIDS Control Program, “Pilot Study in Karachi & Rawalpindi.”
\textsuperscript{93} Bokhari et al., “HIV Risk in Karachi and Lahore, Pakistan.”
\textsuperscript{94} Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round I).
\textsuperscript{95} Blanchard, Khan, and Bokhari, “Variations in the Population Size.”
\textsuperscript{96} Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round I).
\textsuperscript{97} Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round II).
\textsuperscript{98} Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round I).
\textsuperscript{99} Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round II).
\textsuperscript{100} Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round I).
\textsuperscript{101} Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round II).
\textsuperscript{102} Saleem, Adrien, and Razaque, “Risky Sexual Behavior.”
\textsuperscript{103} Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round I).
\textsuperscript{104} Hawkes et al., “HIV and Other Sexually Transmitted Infections.”
\textsuperscript{105} Ibid.
\textsuperscript{106} Ibid.
\textsuperscript{107} ACORD, “Qualitative Socio Economic Research.”
\textsuperscript{108} Ministry of Health and Medical Education of Iran, “Treatment and Medical Education.”
\textsuperscript{109} Hermez et al., “HIV/AIDS Prevention among Vulnerable Groups.”
\textsuperscript{110} Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round I).
\textsuperscript{111} Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round II).
\textsuperscript{112} Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round I).
\textsuperscript{114} Ministry of Health and Medical Education of Iran, “Treatment and Medical Education.”
\textsuperscript{115} Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round I).
\textsuperscript{116} Ati, “HIV/AIDS/STIs Social and Geographical Mapping.”
\textsuperscript{117} Ibid.
\textsuperscript{118} ACORD, “Socio Economic Research.”
\textsuperscript{119} Pakistan National AIDS Programme, “HIV/AIDS Female Sex Workers.”
\textsuperscript{120} Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round II).
\textsuperscript{121} Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round I).
\textsuperscript{122} Pakistan National AIDS Control Program, “HIV/AIDS Female Sex Workers.”
\textsuperscript{124} Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round I).
\textsuperscript{125} Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round II).
and other STIs in commercial sex networks.\textsuperscript{119} Clustering of commercial sex networks into smaller subnetworks can reduce the overall STI prevalence among FSWs.\textsuperscript{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.\textsuperscript{121} In Egypt, 6% of FSWs always used condoms,\textsuperscript{122} 56% had ever used condoms,\textsuperscript{123} and 6.8% used condoms with noncommercial partners during last sex.\textsuperscript{124} In the Islamic Republic of Iran, 24% and 83.2% of two FSW groups used condoms with the most recent client.\textsuperscript{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.\textsuperscript{126} Almost 21% of these FSWs have never used condoms.\textsuperscript{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.\textsuperscript{128}

In Pakistan, 17%–18% of FSWs in different settings always used condoms and 19%–26% did not use condoms during the last month.\textsuperscript{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.\textsuperscript{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.\textsuperscript{131} Also in Pakistan, 10% of migrant workers who had sex with FSWs used condoms.\textsuperscript{132}

In Sudan, 13% of FSWs used condoms regularly,\textsuperscript{133} and as reported in different studies, 10.3%,\textsuperscript{134} 24.6%,\textsuperscript{135} 57.8%,\textsuperscript{136} and 23%\textsuperscript{137} had ever used condoms. In yet another study, only 2% of clients of FSWs used condoms during last sex.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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...
Commercial sex and HIV

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

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. Only a quarter of FSWs in Southern Sudan negotiate condom use with their clients. FSWs may not have the power to negotiate condom use, and fear insistence on condom use would upset customers and result in clients leaving them for other FSWs or offering a lower price. Dire financial need undermines the ability of FSWs to negotiate condom use, 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. Some FSWs are also willing not to use condoms in exchange for a higher price such as in Lebanon, Sudan, and the Republic of Yemen.

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.

MENA settings. Only 41% in Afghanistan and 17.2%, 28%, 45%, and 45.1% in studies in Sudan were aware of condoms. Condoms are often not seen as an HIV prevention measure, but as a contraceptive measure. The dominant mode of HIV prevention reported by FSWs in Sudan was minimizing the number of sexual partners. 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. Only a quarter of FSWs in Southern Sudan negotiate condom use with their clients. FSWs may not have the power to negotiate condom use, and fear insistence on condom use would upset customers and result in clients leaving them for other FSWs or offering a lower price. Dire financial need undermines the ability of FSWs to negotiate condom use, 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. Some FSWs are also willing not to use condoms in exchange for a higher price such as in Lebanon, Sudan, and the Republic of Yemen.

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.

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 across MENA and indicating the heightened risk of exposure to HIV and other STIs in these networks. In the Islamic Republic of Iran, 64% of gonorrhea patients reported acquiring their infection through contacts with street-based FSWs. In Kuwait, 77% of STD clinic attendees reported acquiring their infection from FSWs. A similar outcome was found in another study in Kuwait where the common source of STIs was contact with FSWs. The contacts occurred both in (50%) and outside (48%) of Kuwait.

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

142 World Bank, “Mapping and Situation Assessment.”
143 ACORD, “Qualitative Socio Economic Research.”
145 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.”
153 Al-Mutairi et al., “Clinical Patterns.”
154 Al-Fouzan and Al-Mutairi, “Overview.”
155 Al-Dwaish et al., “HIV/AIDS Prevalence.”
156 Pieniazek et al., “Introduction of HIV-2.”
157 Akhtar and Luby, “Risk Behaviours.”
158 Shah et al., “HIV-Infected Workers Deported”; Baqi, Kayani, and Khan, “Epidemiology and Clinical Profile of HIV/AIDS.”
159 Khawaja et al., “HIV/AIDS and Its Risk Factors in Pakistan.”
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 Gonorrhea.”
163 Al-Mutairi et al., “Clinical Patterns.”
164 Al-Fouzan and Al-Mutairi, “Overview.”
165 Al-Dwaish et al., “HIV/AIDS Prevalence.”
166 Pieniazek 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.”
worker. In Saudi Arabia, 90% of men who were infected with HIV heterosexual acquired it from FSWs. In Somalia, two studies reported that 40% and 54% of STD clinic attendees reported contacts with FSWs. In Sudan, 49.3% of STD patients reported acquiring their infection from FSWs. HIV prevalence in Southern Sudan was 14% among men who reported contacts with FSWs, but 0% among men who denied such contacts.

**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. In Sudan, about 55% of FSWs reported engaging in anal sex and 40% did so regularly. 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. The HIV transmission probability per coital act in unprotected receptive anal intercourse (0.0082) is much higher than that of vaginal intercourse (0.0015).

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

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.

**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. 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. In the Islamic Republic of Iran, 2% of a group of mainly FSWs injected drugs and 15.3% reported noninjecting drug use. In another study, 2.5% of FSWs injected drugs and 60% used drugs. In Pakistan, 20% of FSWs reported that they had clients whom they knew to inject drugs and 1%–2% of FSWs reported injecting drugs. Also, in two studies in Pakistan, 3.3% and 2.3% of FSWs reported injecting drugs in the last six months and 13.5% and 9.9% had sex with IDUs. In yet more studies from Pakistan, 3% of FSWs reported injecting drugs in the last year, 36% reported having sex with an IDU in the last year, 20.3% reported IDUs as clients, and 22.4% reported lovers who inject drugs, and 26% reported having a husband who injects drugs.

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170 Rehan, “Profile of Men.”
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).
178 Ibid.
179 Vittinghoff et al., “Per-Contact Risk.”
180 Wawer et al., “Rates of HIV-1 Transmission.”
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.
186 Jahani et al., “Distribution and Risk Factors.”
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 II).
192 Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round I).
193 Mayhew et al., “Protecting the Unprotected.”
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.”
FSWs seek treatment for STIs through self-treatment or through friends rather than through knowledgeable health personnel. They continue to suffer from unavailability of medical and support services, and continue to fear pursuing such services due to social stigmatization, marginalization, and law enforcement. 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 and 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
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.

BIBLIOGRAPHY


Ministry of Health and Medical Education of Iran. 2006. “Treatment and Medical Education.” Islamic Republic of Iran HIV/AIDS situation and response analysis.


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. It is estimated that there are 2,000 international truck drivers and 60,000 domestic drivers in Afghanistan, and 1 million truck drivers in Pakistan. Migrant males constitute 15%–20% of all adult men in Pakistan.

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.”
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

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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.”
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.
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.

BIBLIOGRAPHY


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>
<thead>
<tr>
<th>Country</th>
<th>HIV prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Djibouti</td>
<td>2.9% (national; Djibouti, Ministére de La Santé, and Association Internationale de Développement 2002)</td>
</tr>
<tr>
<td></td>
<td>3.4% (in Djibouti-ville; UNAIDS 2008)</td>
</tr>
<tr>
<td></td>
<td>1.1% (out of Djibouti-ville; UNAIDS 2008)</td>
</tr>
<tr>
<td></td>
<td>2.0% (Maslin et al. 2005)</td>
</tr>
<tr>
<td></td>
<td>2.2% (Maslin et al. 2005)</td>
</tr>
<tr>
<td>Iran, Islamic Republic of</td>
<td>0.0% (Hamadan province; Amini et al. 1993)</td>
</tr>
<tr>
<td></td>
<td>0.01% (Massarrat and Tahaghoghi-Mehrizi 2002)</td>
</tr>
<tr>
<td>Libya</td>
<td>0.13% (Libya National Center for the Prevention of and Control of Infectious Diseases 2005)</td>
</tr>
<tr>
<td></td>
<td>0.67% (Alkoufraq, El-Gadi, Abudher, and Sammud 2008)</td>
</tr>
<tr>
<td></td>
<td>0.4% (Tripoli; El-Gadi, Abudher, and Sammud 2008)</td>
</tr>
<tr>
<td>Sudan</td>
<td>2.6% (national; SNAP 2005a)</td>
</tr>
<tr>
<td></td>
<td>2.0% (national; UNAIDS and WHO 2003)</td>
</tr>
<tr>
<td></td>
<td>1.6% (national; Sudan MOH 2006)</td>
</tr>
<tr>
<td></td>
<td>1.4% (national; SNAP 2008)</td>
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<tr>
<td></td>
<td>0.4% (Rumbek town, Southern Sudan; Kaiser et al. 2006)</td>
</tr>
<tr>
<td></td>
<td>4.4% (Yei town, Southern Sudan; Kaiser et al. 2006)</td>
</tr>
<tr>
<td></td>
<td>2.7% (in overall in Yei area, Southern Sudan; SNAP, NSNAC, and UNAIDS 2006)</td>
</tr>
</tbody>
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### Table 6.2 HIV Prevalence among ANC Attendees and Other Pregnant Women in MENA

<table>
<thead>
<tr>
<th>Country</th>
<th>HIV prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>0.0% (Todd et al. 2007; Todd et al. 2008)</td>
</tr>
<tr>
<td>Algeria</td>
<td>1.0% (Institut de Formation Paramédicale de Parnet 2004)</td>
</tr>
<tr>
<td></td>
<td>0.53% (Aidaoui, Bouzbid, and Laouar 2008)</td>
</tr>
<tr>
<td></td>
<td>0.7% (Algeria MOH [unknown])</td>
</tr>
<tr>
<td></td>
<td>0.9% (Algeria MOH [unknown])</td>
</tr>
<tr>
<td></td>
<td>0.2% (Alami 2009)</td>
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<td></td>
<td>0.14% (Alami 2009)</td>
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<td></td>
<td>0.09 (Alami 2009)</td>
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<tr>
<td></td>
<td>0.5% (Alami 2008)</td>
</tr>
<tr>
<td></td>
<td>0.23% (Alami 2009)</td>
</tr>
<tr>
<td>Djibouti</td>
<td>2.5% (Unknown 2002)</td>
</tr>
<tr>
<td>Iran, Islamic Republic of</td>
<td>0.02% (Ministry of Health and Medical Education of Iran 2006)</td>
</tr>
<tr>
<td></td>
<td>=0.1% (WHO/EMRO 2007a)</td>
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<td>0.9% (Somaliland; WHO 2004c)</td>
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<td>1.4% (Somaliland; WHO 2004c)</td>
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<td>1.3% (Somaliland; WHO 2004c; Somaliland Ministry of Health and Labour 2007)</td>
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<td></td>
<td>1.3% (Somaliland Ministry of Health and Labour 2007)</td>
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<td>2.2% (Somaliland Ministry of Health and Labour 2007)</td>
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<td>0.8% (Somaliland Ministry of Health and Labour 2007)</td>
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<td>0.6% (central Somalia; WHO 2004c)</td>
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<tr>
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<td>1.4% (refugees; UNHCR 2005)</td>
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<td>1.0% (refugees; UNHCR 2006–07a)</td>
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<td>1.5% (refugees; UNHCR 2006–07a)</td>
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<td></td>
<td>1.6% (refugees; UNHCR 2006–07a)</td>
</tr>
<tr>
<td></td>
<td>1.2% (refugees; UNHCR 2006–07a)</td>
</tr>
<tr>
<td>Country</td>
<td>HIV prevalence</td>
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<tr>
<td>--------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>0.6% (refugees; UNHCR 2006–07a)</td>
</tr>
<tr>
<td>Sudan</td>
<td>0.7% (refugees; UNHCR 2006–07a)</td>
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<td>1.9% (refugees; UNHCR 2006–07a)</td>
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<tr>
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<td>0.1% (refugees; PMTCT attendees; UNHCR 2006–07a)</td>
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<td>1.0% (national; Sudan National AIDS/STIs Program 2008; Sudan National HIV/AIDS Control Program 2005b)</td>
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<td>Sudan</td>
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<td>1.57% (IDPs; SNAP and UNAIDS 2006)</td>
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<td>0.27% (IDPs; Sudan National AIDS/STIs Program 2008)</td>
</tr>
<tr>
<td>Sudan</td>
<td>6–8% (Southern Sudan; UNAIDS and WHO 2003)</td>
</tr>
<tr>
<td>Sudan</td>
<td>3.4% (Southern Sudan; Southern Sudan AIDS Commission 2007)</td>
</tr>
<tr>
<td>Sudan</td>
<td>2.3% (Southern Sudan; NSNAC and UNAIDS 2006)</td>
</tr>
<tr>
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<td>Sudan</td>
<td>3.0% (Juba, Southern Sudan; Basha 2008)</td>
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<tr>
<td>Sudan</td>
<td>4.0% (Juba, Southern Sudan; Basha 2008)</td>
</tr>
<tr>
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<tr>
<td>Sudan</td>
<td>2.3% (Rumbek town; Southern Sudan; SNAP, NSNAC, and UNAIDS 2006; Kaiser et al. 2006)</td>
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<td>Sudan</td>
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</tr>
<tr>
<td>Sudan</td>
<td>0.7% (Yambio; villages near main road; Southern Sudan, NSNAC and UNAIDS 2006)</td>
</tr>
<tr>
<td>Sudan</td>
<td>3.0% (Yambio; villages away from main road; Southern Sudan; NSNAC and UNAIDS 2006)</td>
</tr>
<tr>
<td>Sudan</td>
<td>0.19% (North Sudan; Sudan National AIDS/STIs Program 2008)</td>
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<tr>
<td>Sudan</td>
<td>0.66% (PMTCT attendees; North Sudan; SNAP 2008; NSNAC and UNAIDS 2006)</td>
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<td>Sudan</td>
<td>0.14% (urban; North Sudan; Sudan National AIDS/STIs Program 2008)</td>
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<td>0.33% (rural; North Sudan; Sudan National AIDS/STIs Program 2008)</td>
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<td>1.5% (Red Sea; North Sudan; Sudan National HIV/AIDS Control Program 2005b)</td>
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<tr>
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<td>0.0% (Algadafir; North Sudan; Sudan National HIV/AIDS Control Program 2005b)</td>
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<td>0.0% (Kassala; North Sudan; Sudan National HIV/AIDS Control Program 2005b)</td>
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<td>0.0% (Upper Nile; North Sudan; Sudan National HIV/AIDS Control Program 2005b)</td>
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<td>0.0% (Algazira; North Sudan; SNAP and UNAIDS 2006)</td>
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<td>Sudan</td>
<td>0.0% (Blue Nile; North Sudan; SNAP and UNAIDS 2006)</td>
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<td>Sudan</td>
<td>0.0% (West Kurdufan; North Sudan; SNAP and UNAIDS 2006)</td>
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<tr>
<td>Sudan</td>
<td>0.0% (North Darfur; North Sudan; SNAP and UNAIDS 2006)</td>
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<td>2.2% (White Nile; North Sudan; Sudan National HIV/AIDS Control Program 2005b; SNAP and UNAIDS 2006)</td>
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<td>0.0% (Upper Nile; North Sudan; SNAP and UNAIDS 2006)</td>
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<tr>
<td>Sudan</td>
<td>1–5% (Khartoum; North Sudan; UNAIDS 2000)</td>
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<td>0.5% (Khartoum 1; North Sudan; Sudan National HIV/AIDS Control Program 2005b; Gutbi and Eldin 2006)</td>
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<td>1.2% (refugees; UNHCR 2006–07b)</td>
</tr>
<tr>
<td>Sudan</td>
<td>0.8% (PMTCT attendees; UNHCR 2006–07b)</td>
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</tbody>
</table>

Note: IDP = internally displaced person; PMTCT = prevention of mother-to-child transmission.
<table>
<thead>
<tr>
<th>Country</th>
<th>HIV prevalence</th>
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</thead>
<tbody>
<tr>
<td>Afghanistan</td>
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<tr>
<td></td>
<td>0.0006% (Afghanistan Central Blood Bank 2006)</td>
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<tr>
<td>Algeria</td>
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</tr>
<tr>
<td></td>
<td>0.02% (Unknown 2002)</td>
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<tr>
<td></td>
<td>0.08% (Unknown 2002)</td>
</tr>
<tr>
<td></td>
<td>0.01% (Unknown 2002)</td>
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<tr>
<td>Djibouti</td>
<td>0.0% (Marcelin et al. 2001)</td>
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<tr>
<td></td>
<td>1.9% (Dray et al. 2005)</td>
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<tr>
<td></td>
<td>3.4% (Massenet and Bouh 1997)</td>
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<td>Egypt, Arab Republic of</td>
<td>0.0% (Constantine et al. 1990)</td>
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<td>0.0% (El-Ghazzawi, Hunsmann, and Schneider 1987)</td>
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<td>0.0% (Kandela 1993)</td>
</tr>
<tr>
<td></td>
<td>0.02% (Watts et al. 1993)</td>
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<tr>
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<td>0.0% (Quinti et al. 1995)</td>
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<tr>
<td>Iran, Islamic Republic of</td>
<td>0.0018% (Rezvan, Abolghasemi, and Kafiabad 2007)</td>
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<td>0.005% (Rezvan, Abolghasemi, and Kafiabad 2007)</td>
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<td>0.0% (Jordan National AIDS Program, personal communication)</td>
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<tr>
<td>Kuwait</td>
<td>0.01% (Kuwaitis; Ameen et al. 2005)</td>
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<tr>
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<td>0.00% (non-Kuwaiti Arabs; Ameen et al. 2005)</td>
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<td>0.6% (WHO 2002)</td>
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<td>Morocco</td>
<td>0.02% (Elnir et al. 2002; Elharti 2002)</td>
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<td>Pakistan</td>
<td>0.15% (Abdul Mujeeb and Hashmi 1988)</td>
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<td>0.0% (Iqbal and Rehan 1996)</td>
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<tr>
<td></td>
<td>0–0.06% (Sultan, Mehmood, and Mahmood 2007)</td>
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<td>0.0% (college students; Mujeeb, Aamir, and Mehmood 2006; Abdul Mujeeb, Aamir, and Mehmood 2000)</td>
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<td>Qatar</td>
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<tr>
<td>Saudi Arabia</td>
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<td>1.0% (Kulane et al. 2000)</td>
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<tr>
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<tr>
<td></td>
<td>7.0% (Labone; Southern Sudan; NSNAC and UNAIDS 2006)</td>
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<tr>
<td></td>
<td>13.5% (Chukudum; Southern Sudan; NSNAC and UNAIDS 2006)</td>
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<tr>
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<td>12.7% (Yei; Southern Sudan; NSNAC and UNAIDS 2006)</td>
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<tr>
<td></td>
<td>0.05% (Hashim et al. 1997)</td>
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<tr>
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<td>0.9% (Winsbury 1996)</td>
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<td>0.8–1.8% (WHO/EMRO 2007a)</td>
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<td></td>
<td>1.25% (SNAP 2008)</td>
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</table>
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.

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1 Pisani et al., “HIV Surveillance.”
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%).

In the Morocco study, almost 20% of women reported more than one lifetime sexual partner, with 2% reporting more than three partners. 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.

A behavioral surveillance study among the general population in Juba, Southern Sudan, also provided valuable data. 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. Among women, the corresponding percentages were 8 and also 8, respectively. Casual sex in the last year was reported by 11.7% of men and 1.5% of women. The mean number of casual partners in the last year among those who had casual sex was two for both men and women. Casual sex was found to be much more common among unmarried men (19%) than married men (4%). In the last year, 1.7% of men reported paying for sex and 0.2% of women reported exchanging sex for money.

Three percent of women, but no men, reported ever being forced to have sex. 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. 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. In another study, 38% of clients of FSWs were married, suggesting that marriage does not preclude contact with FSWs.

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. In another study, 52% of men were sexually active before age 20, and 22% of unmarried men had sexual relations with nonregular partners. In a third study, 30.8% of the general population was sexually active but unmarried, and 13% of them had nonspousal regular partners. 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. Among the sexually active population, 16.8% had nonregular sexual partners and 31.4% paid money or gifts for sex.

In Pakistan, 6% of general population respondents had extramarital affairs and only 5% had ever used condoms. In another study, the average frequency of coital acts, whether marital or extramarital, was 3.5 per week.
In Somalia, 34% of general population men and 22.5% of general population women had more than one sexual partner in the previous year. Also in Somalia, 32% of women attending STD (sexually transmitted disease) clinics were unmarried, and 4% of pregnant women attending ANC centers were also unmarried. Among Somali refugees in Kenya, HIV prevalence was associated with polygamy, although not with statistical significance.

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. 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. In further studies from Sudan, 12% of adults reported a nonregular sexual partner in the last year, and premarital or extramarital sex was reported by 14.4% of university students, 5.4% of ANC women attendees, 10.3% of tea sellers, and 15.3% of tuberculosis (TB) patients.

Furthermore, premarital sex was reported by 1.2% of ANC women attendees, 0.5% of tea sellers, and 1% of TB patients. 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. Median age at first sex was 13.8 for males and 18 for females. Recent extramarital sex was reported by 4.5% of males and 1.7% of females.

Nonconventional marriage forms and polygamy

Anecdotal evidence suggests an increasing prevalence of nonconventional forms of marriage in MENA. 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. 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. *Sigheh* appears to be common in the Islamic Republic of Iran, such as among divorced women with limited financial resources. It was also encouraged by political leaders following the Islamic Revolution and is seen as an alternative to premarital or extramarital sex. 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. 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.

Another form of nonconventional marriage is ‘*urfi’ marriage (clandestine marriage). 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. While there are no reliable estimates of the number of

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26 Jenkins and Robalino, “HIV in the Middle East and North Africa.”
27 WHO/EMRO, “Presentation of WHO Somalia’s Experience.”
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.
‘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 from 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 Reudi-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.
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.
81 Obasi et al., “Antibody to Herpes Simplex Virus Type 2.”
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.”
Intergenerational sex puts women at higher risk of exposure to STIs. 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. Intergenerational sex has been implicated as the main reason behind the large gap in HIV prevalence between men and women in sub-Saharan Africa. Though age at marriage has increased rapidly over the last three decades, 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.

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. Anecdotal evidence points to increases in sexual activity, sexual risk behavior, and STIs among boys and girls.

**MALE CIRCUMCISION**

Male circumcision is nearly universal in MENA, 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. 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). The prevalence of male circumcision is

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86 Huff, “Male Circumcision: Cutting the Risk?”
88 Sakalli-Ugurlu and Glick, “Ambivalent Sexism.”
89 International Planned Parenthood Federation, “Unsafe Abortion.”
90 Gursoy and Viral, “Nurses’ and Midwives’ Views.”
91 Mostafa and Roshdy, “Risk Profiles.”
92 Ryan et al., “Reproductive Tract Infections.”
93 Al-Mutairi et al., “Clinical Patterns.”
95 Chaouki et al., “The Viral Origin of Cervical Cancer.”
97 Rashad, “Demographic Transition.”
100 Busulwa, “HIV/AIDS Situation Analysis Study.”
101 Weiss et al., “Male Circumcision.”
102 Auvert et al., “Randomized, Controlled Intervention Trial”; Bailey et al., “Male Circumcision”; Gray et al., “Male Circumcision.”
103 UNHCHR, “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. The prevalence of female genital mutilation is estimated at 98% in Djibouti, 97.3% in Egypt, 94% in southern Somalia, 89% in Sudan, and 22.6% in the Republic of Yemen. Although three-quarters of girls in Egypt undergo this procedure by medically trained personnel, 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.

**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. Unsafe abortions are also at low levels in MENA compared to other regions.

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, and is associated with a biological efficacy against HIV infection. Male circumcision is associated with lower HIV prevalence at the population level, and its role in HIV dynamics appears to be “quarantining” HIV sustainable transmission to within higher risk groups with

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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."
109 Roudi-Fahimi and Ashford, "Sexual & Reproductive Health."
110 Roudi-Fahimi and Ashford, "Sexual & Reproductive Health of Young People."
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 Ayvert 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.\textsuperscript{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.\textsuperscript{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.

\textbf{BIBLIOGRAPHY}


\textsuperscript{115} Alsallaq et al., “Quantitative Assessment.”


Ministry of Health and Medical Education of Iran. 2006. “Treatment and Medical Education.” Islamic Republic of Iran HIV/AIDS situation and response analysis.


Characterizing the HIV/AIDS Epidemic in the Middle East and North Africa

Control Programme. HIV sentinel surveillance, Dadaab Refugee Camps, Nairobi, Kenya.


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% bisexualy.1 Among STD clinic attendees and suspected AIDS patients 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, Kuwait, Pakistan, Somalia, and Sudan.

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.

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1 Rehan, “Profile of Men.”

2 Ahmed, STDs.
3 Ahmed, AIDS Patients.
4 Zargooshi, “Characteristics of Gonorrhoea.”
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.”
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 reports or are provided through national-level agencies. These surveys may not be conducted using sound methodology or internationally accepted guidelines for HIV surveillance. Therefore, 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
Further Evidence Related to HIV Epidemiology in MENA

0.09%.

Figure 7.1 displays the percentage of these tests that were positive among different population groups.

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 interpopulation 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.

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 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

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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.\textsuperscript{13}

\textbf{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.

\section*{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,\textsuperscript{14} Israel (Arab Israelis),\textsuperscript{15} Lebanon,\textsuperscript{16} Morocco,\textsuperscript{17} Pakistan,\textsuperscript{18} Saudi Arabia,\textsuperscript{19} and Sudan,\textsuperscript{20} respectively. The percentages of HIV infections that are among men are 81\% in the Arab Republic of Egypt,\textsuperscript{21} 94\% in the Islamic Republic of Iran,\textsuperscript{22} 81.75\% in Lebanon,\textsuperscript{23} 70\% in Oman,\textsuperscript{24} 88.4\% (up to 1997) in Pakistan,\textsuperscript{25} and 79.4\% in the West Bank and Gaza.\textsuperscript{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,\textsuperscript{27} but it increased to 8.5 to 1 by 2004.\textsuperscript{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.\textsuperscript{29} In Algeria, the ratio of men to women decreased from 5.1 at the beginning of the epidemic to 1.1 in 2004.\textsuperscript{30} The proportion of infections in women in Morocco has steadily increased to reach almost 50\%, compared to 20\% only five years earlier.\textsuperscript{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.\textsuperscript{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.\textsuperscript{33}

\section*{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

\begin{thebibliography}{99}
\bibitem{Gheiratmand2016} Gheiratmand et al., "Uncertainty on the Number of HIV/AIDS Patients."
\bibitem{AlHaddad2016} Al-Haddad et al., "HIV Antibodies."
\bibitem{Chemtob2016} Chemtob and Srou, "Epidemiology of HIV Infection."
\bibitem{Jurjus2016} Jurjus et al., "Knowledge, Attitudes, Beliefs, and Practices."
\bibitem{Elharti2016} Elharti et al., "Some Characteristics of the HIV Epidemic in Morocco."
\bibitem{Rajabali2016} Rajabali et al., "HIV and Homosexuality in Pakistan”; UNAIDS and WHO, AIDS Epidemic Update 2006.
\bibitem{UNAIDS2016} UNAIDS and WHO, AIDS Epidemic Update 2006.
\bibitem{WHO2016} WHO, “Summary Country Profile.”
\end{thebibliography}
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.  

**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, the main transmission mode is unprotected vaginal and anal sex, followed by drug injection. 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. 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. 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. In Lebanon, 45.36% of notified HIV/AIDS cases up to 2004 were linked to travel abroad. Half of reported AIDS cases in the Republic of Yemen were linked to a travel history abroad. 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

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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.”
Table 7.1 HIV Transmission Modes for a Number of MENA Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Heterosexual transmission</th>
<th>Homosexual transmission</th>
<th>Injecting drug transmission</th>
<th>Blood or blood products transmission</th>
<th>Mother-to-child transmission</th>
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<tr>
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<td>45.71% Algeria MOH [unknown]</td>
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<td>20.0% [UNAIDS and WHO 2005]</td>
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<td>Iran, Islamic Republic of</td>
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<td>87.0% [Iran Center for Disease Management 2004]</td>
<td>1.8% [Ministry of Health and Medical Education of Iran 2006]</td>
<td>0.5% [Ministry of Health and Medical Education of Iran 2006]</td>
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<td>82.0% [Gouya 2006]</td>
<td>0.35% [Hamadan province; Ghannad et al. 2009]</td>
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<td>78.0% [Hamadan province; Ghannad et al. 2009]</td>
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<td>Kuwait</td>
<td>48.0% [Al-Fouzan and Al-Mutairi 2004]</td>
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<td>56.0% [Kassak et al. 2008]</td>
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<td>Morocco</td>
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<td>0.62% [Elharti et al. 2002]</td>
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<td>80.0% [Alami 2009]</td>
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<td>4.63% [Elharti et al. 2002]</td>
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<tr>
<td></td>
<td>83.0% [Morocco MOH [unknown]]</td>
<td></td>
<td></td>
<td></td>
<td>3.0% [Alami 2009]</td>
</tr>
<tr>
<td>Pakistan</td>
<td>3.2% [Khan and Hyder 1998]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.0% [Rajabali et al. 2008; UNAIDS and WHO 2006]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qatar</td>
<td>Main transmission mode [Qatar 2008]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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. Monitoring recent infections and examining the nature of exposures could also be useful in detecting emerging endemic transmission chains in these countries.

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<table>
<thead>
<tr>
<th>Country</th>
<th>Heterosexual transmission</th>
<th>Homosexual transmission</th>
<th>Injecting drug transmission</th>
<th>Blood or blood products transmission</th>
<th>Mother-to-child transmission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saudi Arabia</td>
<td>37.9% (Al-Mazrou et al. 2005)</td>
<td>2.5% (Al-Mazrou et al. 2005)</td>
<td>1.3% (Al-Mazrou et al. 2005)</td>
<td>25.0% (Al-Mazrou et al. 2005)</td>
<td>6.5% (Al-Mazrou et al. 2005)</td>
</tr>
<tr>
<td>Sudan</td>
<td>97.0% (UNAIDS and WHO 2007; SNAP, UNICEF, and UNAIDS 2005; Farah and Hussein 2006)</td>
<td>8.0% (Syria National AIDS Programme 2004)</td>
<td>4.0% (Syria National AIDS Programme 2004)</td>
<td>12.0% (Syria National AIDS Programme 2004)</td>
<td>3.0% (Syria National AIDS Programme 2004)</td>
</tr>
<tr>
<td>Syrian Arab Republic</td>
<td>70.0% (Syria National AIDS Programme 2004)</td>
<td>6.5% (men; Hsairi and Ben Abdallah 2007)</td>
<td>37.1% (Hsairi and Ben Abdallah 2007)</td>
<td>12.0% (Syria National AIDS Programme 2004)</td>
<td>3.0% (Syria National AIDS Programme 2004)</td>
</tr>
<tr>
<td>Tunisia</td>
<td>56.3% (Kilani et al. 2007)</td>
<td>75.0% (women; Zouiten et al. 2002)</td>
<td>67.2% (women; Hsairi and Ben Abdallah 2007)</td>
<td>25.7% (men; Hsairi and Ben Abdallah 2007)</td>
<td>12.0% (Syria National AIDS Programme 2004)</td>
</tr>
<tr>
<td>West Bank and Gaza</td>
<td>52.0% (UNAIDS 2007)</td>
<td>1.0% (UNAIDS 2007)</td>
<td>4.7% (UNAIDS 2007)</td>
<td>17.6% (UNAIDS 2007)</td>
<td>3.0% (Syria National AIDS Programme 2004)</td>
</tr>
<tr>
<td>Yemen, Republic of</td>
<td>77.3% (Lambert 2007)</td>
<td>16.0% (Lambert 2007)</td>
<td>6.8% (Lambert 2007)</td>
<td>3.0% (Syria National AIDS Programme 2004)</td>
<td>3.0% (Syria National AIDS Programme 2004)</td>
</tr>
</tbody>
</table>

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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. 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. 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. Public health systems are overstretched, leading to some careless attitudes toward safety measures.

Standard precautions are not routinely implemented in public health care, and even less so in private practices such as among dentists and in hemodialysis centers. Injections are preferred mode of therapy even when alternative modes are equally effective, and some health practitioners see this as an opportunity for charging additional fees. Injections by non-medical providers are rampant, such as in Afghanistan, where they were reported by 38% of the participants of a study. Financial limitations contribute to the reuse of syringes.

Blood transfusions are performed even when not medically indicated; 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. 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. 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 non-sterile needles with others, respectively.

Occupational injuries among HCWs are common, such as in Morocco where they were found to be at high frequency, although they were rarely declared. Forty-nine percent of HCWs in Egypt, 58.9% in Morocco, and 45% in Pakistan reported a needlestick injury in the previous year. 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.

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. The

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41 Kane et al., “Transmission of Hepatitis”; Simonsen et al., “Unsafe Injections.”
44 Zafar et al., “Risk Perception and Precautions.”
45 Askarian, Mirzaei, and McLaws, “Attitudes, Beliefs, and Infection Control”; Askarian, Mirzaei, and Cookson, “Knowledge, Attitudes, and Practice.”
46 Kabbash et al., “Risk Perception and Precautions.”
47 Janjua et al., “Population Beliefs”; Altaf et al., “Determinants of Therapeutic Injection Overuse.”
48 Janjua, Akhtar, and Hatin, “Injection Use.”
49 Kabbash et al., “Risk Perception and Precautions.”
51 Janjua, Akhtar, and Hutin, “Injection Use.”
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.”
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 Precautions.”
62 Ibid.
64 Haddad 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.

References

65 Jahan, “Epidemiology of Needlestick Injuries.”
66 Moghimi et al., “Knowledge, Attitude, and Practice.”
67 Kabbash et al., “Risk Perception and Precautions.”
69 Measure DHS, “Egypt: Demographic and Health Survey 2005.”
71 Ibid.
72 Ibid.
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.”
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.”
### Table 7.2 HIV Prevalence among Populations at Risk of Parenteral HIV Infection (excluding IDUs)

<table>
<thead>
<tr>
<th>Country</th>
<th>HIV prevalence among populations at risk of parenteral HIV infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahrain</td>
<td>1.6% (children with hereditary hemolytic anemias; Al-Mahroos and Ebrahim 1995)</td>
</tr>
<tr>
<td>Egypt, Arab Republic of</td>
<td>4.8% (blood or blood products recipients; Watts et al. 1993)</td>
</tr>
<tr>
<td>Iran, Islamic Republic of</td>
<td>0.0% (thalassemia patients; Mirmomen et al. 2006)</td>
</tr>
<tr>
<td></td>
<td>0.0% (thalassemia patients; Ansar and Kooloobandi 2002)</td>
</tr>
<tr>
<td></td>
<td>0.0% (thalassemia patients; Alavian, Gholami, and Masarrat 2002)</td>
</tr>
<tr>
<td></td>
<td>0.0% (thalassemia patients; Javadzadeh, Attar, and Taher Yavari 2006)</td>
</tr>
<tr>
<td></td>
<td>0.0% (thalassemia patients; Khamispoor and Tahmasebi 1999)</td>
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<tr>
<td></td>
<td>0.0% (thalassemia patients; Basiratnia, HosseiniAsli, and Avijegan 1999)</td>
</tr>
<tr>
<td></td>
<td>0.0% (thalassemia patients; Kadivar et al., 2001)</td>
</tr>
<tr>
<td></td>
<td>0.0% (thalassemia patients; Nakaia and Talachian 2003)</td>
</tr>
<tr>
<td></td>
<td>0.0% (thalassemia patients; Rezvan, Abolghassemi, and Kafiabad 2007)</td>
</tr>
<tr>
<td></td>
<td>0.0% (thalassemia patients; Marcelin et al. 2001)</td>
</tr>
<tr>
<td></td>
<td>0.0% (multitransfused thalassaemic children; Karimi and Ghavanini 2001b)</td>
</tr>
<tr>
<td></td>
<td>0.71% (multitransfused patients with hemophilia; Karimi and Ghavanini 2001a)</td>
</tr>
<tr>
<td></td>
<td>2.3% (hemophiliacs; Alavian, Ardeshi, and Hajarizadeh 2001)</td>
</tr>
<tr>
<td></td>
<td>0.0% (hemophiliacs; Karimi, Yarmohammadi, and Ardeehi 2002)</td>
</tr>
<tr>
<td></td>
<td>0.9% (hemophiliacs; Torabi et al. 2006)</td>
</tr>
<tr>
<td></td>
<td>1.4% (hemophiliacs; Javadzadeh, Attar, and Taher Yavari 2006)</td>
</tr>
<tr>
<td></td>
<td>0.0% (hemophiliacs; Mansour-Ghanaei et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>0.0% (hemophiliacs; Khamispoor and Tahmasebi 1999)</td>
</tr>
<tr>
<td>Jordan</td>
<td>0.0% (multitransfused patients; Al-Sheyyab, Batiha, and El-Khateeb 2001)</td>
</tr>
<tr>
<td>Lebanon</td>
<td>6.0% (multitransfused patients; Mokhat et al. 1989)</td>
</tr>
<tr>
<td>Morocco</td>
<td>0.0% (hemodialysis patients; Boulaajaj et al. 2005)</td>
</tr>
<tr>
<td>Pakistan</td>
<td>0.98% (multitransfused patients; Mujeeb and Hafeez 1993; hemodialysis patients; Khamispoor and Tahmasebi 1999)</td>
</tr>
<tr>
<td>Qatar</td>
<td>38.5% (children with thalassemia; Novelli et al. 1987)</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>1.3% (multitransfused thalassemic and sickle cell disease patients; El-Hazmi and Ramia 1989)</td>
</tr>
<tr>
<td></td>
<td>0.0% (children undergoing cancer therapy; Bakir et al. 1995)</td>
</tr>
<tr>
<td>Tunisia</td>
<td>0.0% (hemodialysis patients; Hmida et al. 1995)</td>
</tr>
<tr>
<td></td>
<td>8.6% (hemophiliacs; Langar et al. 2005)</td>
</tr>
</tbody>
</table>

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 transmission 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 Egypt\(^{89}\) and Pakistan.\(^{90}\) For the rest of the countries, intermediate prevalence levels are found in the general population. These levels are not

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\(^{84}\) Colombo, Rumi, and Ninno, “Treatment of Chronic Hepatitis C in Europe.”


\(^{86}\) Rezvan, Abolghassemi, and Kafiabag, “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”; Aslam et al., “Association between Smallpox Vaccination and Hepatitis C.”
Further Evidence Related to HIV Epidemiology in MENA

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.”
93 Zahrour-Mehadj et al., “Infectious Risks.”
94 Candan et al., “Prevalence of Hepatitis.”
97 Zahrour-Mehadj et al., “Infectious Risks.”
98 UNAIDS, “Notes on AIDS in the Middle East and North Africa.”
100 Mirmomen et al., “Epidemiology of Hepatitis.”
101 Taziki and Espahbodi, “Prevalence of Hepatitis.”
102 Alavian et al., “Hepatitis B and C.”
104 Measure DHS, “Egypt: Demographic and Health Survey 2005.”
105 Mujeeb and Pearce, “Temporal Trends in Hepatitis B and C.”
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 recombinants 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

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109 Kuruuzum et al., "Risk of Infection."

110 Gisselquist et al., “Let It Be Sexual”; Gisselquist et al., "HIV Infections."

111 Maslin et al., "Transmission of HIV-1."

112 Misbal et al., "Risk of Transmission."


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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. 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.

In Lebanon, a complex HIV subtype distribution pattern was found representing the infection’s travel history from its point of origination. Even within a single subtype, high levels of genetic intrasubtype diversity were found, suggesting multiple introductions of the virus to Lebanon.

A study of a nosocomial HIV outbreak in a children’s hospital in Libya linked the virus to a strain originating in West Africa. In Morocco, 93.5% of HIV infections were found to be of subtype B. More recent data, however, suggest an increasing diversity of subtypes, with 34% of the cases carrying nonsubtype B viruses. In the West Bank and Gaza, subtype B was also dominant and the phylogenetic tree analyses indicated multiple introductions of HIV into the population. Subtype A was the only subtype observed among a group of IDUs in Pakistan.

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. Two kinds of sequences (CRF25_cpx and CRF43_02G) were found to form distinct subclusters, suggesting a transmission network within Saudi Arabia.

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. 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. 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. 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. 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.

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125 Sanders-Buell et al., “A Nascent HIV Type 1 Epidemic.”
126 Soheilli et al., “Presence of HIV-1 CRF35_AD in Iran.”
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 Hiejholtier et al., “HIV Type 1 Strains.”
137 Ben Halima et al., “First Molecular Characterization.”
138 Sead 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.

BIBLIOGRAPHY

Askarian, M., K. Mirtaei, and B. Cookson. 2007. “Knowledge, Attitudes, and Practice of Iranian...


Characterizing the HIV/AIDS Epidemic in the Middle East and North Africa


Ministry of Health and Medical Education of Iran. 2006. “Treatment and Medical Education.” Islamic Republic of Iran HIV/AIDS situation and response analysis.


Further Evidence Related to HIV Epidemiology in MENA


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. 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.

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, and they may do so out of pregnancy concerns rather than for HIV prevention. 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. 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. The most cited reasons for not using condoms are high condom prices.

1. SNAP, UNICEF, and UNAIDS, “Baseline Study on Knowledge.”
<table>
<thead>
<tr>
<th>Country</th>
<th>Knowledge of condoms</th>
<th>Knowledge of condom use for HIV prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>25.0% (TB patients; Todd et al. 2007) 41.0% (FSWs; World Bank 2008)</td>
<td>60.0% (general population; Kabbash et al. 2007) 49.3% (MSM; El-Sayyed, Kabbash, and El-Gueniedy 2008)</td>
</tr>
<tr>
<td>Egypt, Arab</td>
<td>10.0% (adolescents; El-Tawila et al. 1999)</td>
<td>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)</td>
</tr>
<tr>
<td>Republic of Iran,</td>
<td>Majority (adolescents; Mohammadi et al. 2006)</td>
<td>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)</td>
</tr>
<tr>
<td>Republic of</td>
<td>49.3% (MSM; El-Sayyed, Kabbash, and El-Gueniedy 2008)</td>
<td>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)</td>
</tr>
<tr>
<td>Jordan</td>
<td>84.4% (general population women; Measure DHS 1998)</td>
<td>33.0% (general population women; Measure DHS 2003)</td>
</tr>
<tr>
<td>Lebanon</td>
<td>84.1% (general population; Jurjus et al. 2004)</td>
<td>33.0% (general population women; Measure DHS 2003)</td>
</tr>
<tr>
<td>Morocco</td>
<td>37.5% (general population women; Morocco MOH 2004) 53.8% (youth; Morocco MOH, with GTZ, 2007) 73.4% (FSWs; Morocco MOH 2007)</td>
<td>37.5% (general population women; Zidouh [unknown]) 53% (youth; Morocco MOH, with GTZ, 2007) 53% (FSWs; Morocco MOH 2007)</td>
</tr>
<tr>
<td>Pakistan</td>
<td>94.0% hijras (Khan et al. 2008)</td>
<td>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% hijras (Khan et al. 2008)</td>
</tr>
<tr>
<td>Somalia</td>
<td>23.0% (women under age 24; Population Studies Research Institute 2000)</td>
<td>18.5% (street children; Ahmed 2004b) 27.4% (university students; Ahmed 2004b) 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 2004a) 11.3% (internally displaced persons; Ahmed 2004a) 2.0% (police officers; Abdelwahab 2008) 5.7% (military personnel; Ahmed 2004d) 9.1% (prisoners; Ahmed 2004e) 7.5% (truck drivers; Ahmed 2004h) 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)</td>
</tr>
<tr>
<td>Sudan</td>
<td>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)</td>
<td>18.5% (street children; Ahmed 2004b) 27.4% (university students; Ahmed 2004b) 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 2004a) 11.3% (internally displaced persons; Ahmed 2004a) 2.0% (police officers; Abdelwahab 2008) 5.7% (military personnel; Ahmed 2004d) 9.1% (prisoners; Ahmed 2004e) 7.5% (truck drivers; Ahmed 2004h) 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)</td>
</tr>
</tbody>
</table>
Table 8.1 (Continued)

<table>
<thead>
<tr>
<th>Country</th>
<th>Knowledge of condoms</th>
<th>Knowledge of condom use for HIV prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syrian Arab Republic</td>
<td>45.0% (FSWs; Sudan National HIV/AIDS Control Program 2004)</td>
<td>38.0% (IDUs; Syria Mental Health Directorate 2008)</td>
</tr>
<tr>
<td>Tunisia</td>
<td>38.0% (IDUs; Anonymous 2007)</td>
<td>45.1% (FSWs; Anonymous 2007)</td>
</tr>
<tr>
<td>West Bank and Gaza</td>
<td>89.2% (MSM; Hsairi and Ben Abdallah 2007)</td>
<td>67.0% (youth; PFPPA 2005)</td>
</tr>
<tr>
<td>Yemen, Republic of</td>
<td>48.3% (general population, marginalized minority, and returnees from extended work abroad; Busulwa 2003)</td>
<td>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)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Country</th>
<th>Condom use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>0.0% (ever use; IDUs; Sanders-Buell et al. 2007)</td>
</tr>
<tr>
<td></td>
<td>17.0% (ever use; commercial sex; IDUs; World Bank 2008)</td>
</tr>
<tr>
<td></td>
<td>36.0% (ever use; FSWs; World Bank 2008)</td>
</tr>
<tr>
<td>Djibouti</td>
<td>48.4% (ever use; sexually active high school students; Rodier et al. 1993)</td>
</tr>
<tr>
<td></td>
<td>24.2% (always; sexually active high school students; Rodier et al. 1993)</td>
</tr>
<tr>
<td></td>
<td>Rare (STD clinic attendees; Wassef et al. 1989)</td>
</tr>
<tr>
<td></td>
<td>Not common (unlicensed FSWs; Wassef et al. 1989)</td>
</tr>
<tr>
<td></td>
<td>Common (bar hostesses; Wassef et al. 1989)</td>
</tr>
<tr>
<td>Egypt, Arab Republic of</td>
<td>90.0% (casual sex; tourism workers; El-Sayed et al. 1996)</td>
</tr>
<tr>
<td></td>
<td>23.9% (contraceptive method; general population; Kabbash et al. 2007)</td>
</tr>
<tr>
<td></td>
<td>Low (regular use; university students; Refaat 2004)</td>
</tr>
<tr>
<td></td>
<td>34.1% (ever use; regular partners; IDUs; Egypt MOH and Population National AIDS Program 2006)</td>
</tr>
<tr>
<td></td>
<td>12.8% (ever use; nonregular noncommercial partners; IDUs; Egypt MOH and Population National AIDS Program 2006)</td>
</tr>
<tr>
<td></td>
<td>11.8% (ever use; with CSWs; IDUs; Egypt MOH and Population National AIDS Program 2006)</td>
</tr>
<tr>
<td></td>
<td>66.0% (ever use; IDUs; Elshimi, Warner-Smith, and Aon 2004)</td>
</tr>
<tr>
<td></td>
<td>20.0% (ever use; IDUs; El-Sayed et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>9.0% (always; IDUs; El-Sayed et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>44.0% (ever use; FSWs; El-Sayed et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>6.8% (last sex act with a noncommercial partner; FSWs; Egypt MOH and Population National AIDS Program 2006)</td>
</tr>
<tr>
<td></td>
<td>6.0% (always; FSWs; El-Sayed et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>56.0% (ever use; FSWs; El-Sayed et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>6.8% (last sex; noncommercial partners; IDUs; Egypt MOH and Population National AIDS Program 2006)</td>
</tr>
<tr>
<td></td>
<td>47.0% (ever use; MSM; El-Sayed et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>19.0% (regularly; MSM; EI-Rahman 2004)</td>
</tr>
<tr>
<td></td>
<td>2.0% (consistent; MSM; El-Sayed 1994)</td>
</tr>
<tr>
<td></td>
<td>19.0% (consistent; MSM; El-Sayed et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>19.2% (consistent; MSM; El-Sayed, Kabbash, and El-Gueniedy 2008)</td>
</tr>
<tr>
<td></td>
<td>9.2% (last commercial sex; MSM; Egypt MOH and Population National AIDS Program 2006)</td>
</tr>
<tr>
<td></td>
<td>12.7% (last noncommercial sex; MSM; Egypt MOH and Population National AIDS Program 2006)</td>
</tr>
<tr>
<td></td>
<td>21.0% (ever use; MSM; El-Sayed 1994)</td>
</tr>
<tr>
<td></td>
<td>47.9% (ever use; MSM; El-Sayed, Kabbash, and El-Gueniedy 2008)</td>
</tr>
</tbody>
</table>

(continued)
<table>
<thead>
<tr>
<th>Country</th>
<th>Condom use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iran, Islamic Republic of</td>
<td>71.7% (ever use; youth; Mohammad et al. 2007)</td>
</tr>
<tr>
<td></td>
<td>48.0% (ever use; university students; Simbar, Tehrani, and Hashemi 2005)</td>
</tr>
<tr>
<td></td>
<td>64.8% (ever use; truck drivers; Tehrani and Malek-Azfali 2008)</td>
</tr>
<tr>
<td></td>
<td>89.0% (recent use; clients of FSWs; Zargooshi 2002)</td>
</tr>
<tr>
<td></td>
<td>53.0% (ever use; IDUs; Zamani et al. 2005)</td>
</tr>
<tr>
<td></td>
<td>52.0% (ever use; IDUs; Nareanjha et al. 2005)</td>
</tr>
<tr>
<td></td>
<td>37.0% (last sex; IDUs; Zamani et al. 2005)</td>
</tr>
<tr>
<td></td>
<td>11.3%–12.4% (ever use; IDU prisoners; Farhoudi et al. 2003)</td>
</tr>
<tr>
<td></td>
<td>52.0% (ever use; FSWs; Tehrani and Malek-Azfali 2008)</td>
</tr>
<tr>
<td></td>
<td>50.0% (ever use; FSWs; Ministry of Health and Medical Education of Iran 2004)</td>
</tr>
<tr>
<td></td>
<td>24%–83.2% (last client; FSWs; Jahani et al. 2005; Ardalan et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>19.4% (last anal sex; steady partners; MSM; Eftekhari et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>59.5% (last anal sex; commercial sex partners; MSM; Eftekhari et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>59.9% (last anal sex; casual partners; MSM; Eftekhari et al. 2008)</td>
</tr>
<tr>
<td>Jordan</td>
<td>Moderately high (nonmarital sex; youth; UNAIDS and WHO 2005)</td>
</tr>
<tr>
<td></td>
<td>4.0% (last sex; general population women; Measure DHS 2003)</td>
</tr>
<tr>
<td>Kuwait</td>
<td>1.5% (recent use; STD clinic attendees; Al-Mutairi et al. 2007)</td>
</tr>
<tr>
<td>Lebanon</td>
<td>7.0% (current use; married women; Kulczycki 2004)</td>
</tr>
<tr>
<td></td>
<td>24.0% (current use; married women; Kulczycki 2004)</td>
</tr>
<tr>
<td></td>
<td>32.0% (ever use; general population; Lebanon National AIDS Control Program 1996)</td>
</tr>
<tr>
<td></td>
<td>25.0% (last sex regular partnerships; general population; Jurjus et al. 2004)</td>
</tr>
<tr>
<td></td>
<td>71.7% (last sex nonregular partnerships; general population; Jurjus et al. 2004)</td>
</tr>
<tr>
<td></td>
<td>15.3% (ever use; general population; Jurjus et al. 2004)</td>
</tr>
<tr>
<td></td>
<td>23.4% (last sex while drunk; prisoners; Mishwar 2008)</td>
</tr>
<tr>
<td></td>
<td>88.0% (ever use; IDUs; Aaraj [unknown])</td>
</tr>
<tr>
<td></td>
<td>59.0% (ever use; IDUs; Ingold 1994)</td>
</tr>
<tr>
<td></td>
<td>5.8% (last sex; regular; IDUs; Aaraj [unknown]; Hermez et al. [unknown])</td>
</tr>
<tr>
<td></td>
<td>34.6% (last sex; casual sex; IDUs; Aaraj [unknown]; Hermez et al. [unknown])</td>
</tr>
<tr>
<td></td>
<td>39.3% (last sex; commercial sex; IDUs; Aaraj [unknown]; Hermez et al. [unknown])</td>
</tr>
<tr>
<td></td>
<td>28.1% (always; nonregular clients; FSWs; Hermez et al. [unknown])</td>
</tr>
<tr>
<td></td>
<td>34.8% (always; regular clients; FSWs; Hermez et al. [unknown])</td>
</tr>
<tr>
<td></td>
<td>11.9% (always; regular partners; FSWs; Hermez et al [unknown])</td>
</tr>
<tr>
<td></td>
<td>79.0% (ever use; FSWs; Hermez [unknown])</td>
</tr>
<tr>
<td></td>
<td>98.0% (last sex; FSWs; Mishwar 2008)</td>
</tr>
<tr>
<td></td>
<td>94.0% (last sex; FSWs; Mishwar 2008)</td>
</tr>
<tr>
<td></td>
<td>43.0% (last sex; FSWs; Mishwar 2008)</td>
</tr>
<tr>
<td></td>
<td>80.0% (last sex; FSWs; Rady 2005)</td>
</tr>
<tr>
<td></td>
<td>32.3% (consistent; regular client; FSWs; Lebanon National AIDS Control Program 2008)</td>
</tr>
<tr>
<td></td>
<td>26.2% (consistent; nonclient; FSWs; Lebanon National AIDS Control Program 2008)</td>
</tr>
<tr>
<td></td>
<td>35.1% (consistent; vaginal sex; FSWs; Lebanon National AIDS Control Program 2008)</td>
</tr>
<tr>
<td></td>
<td>13.9% (consistent; oral sex; FSWs; Lebanon National AIDS Control Program 2008)</td>
</tr>
<tr>
<td></td>
<td>36.1% (consistent; anal sex; FSWs; Lebanon National AIDS Control Program 2008)</td>
</tr>
<tr>
<td></td>
<td>88.0% (ever use; MSM; Aaraj [unknown])</td>
</tr>
<tr>
<td></td>
<td>47.1% (always; regular partners; MSM; Hermez et al.; Dewachi 2001)</td>
</tr>
<tr>
<td></td>
<td>54.5% (always; noncommercial casual partner; MSM; Hermez et al. [unknown]; Dewachi 2001)</td>
</tr>
<tr>
<td></td>
<td>47.0% (last anal sex; regular partner; MSM; Mishwar 2008)</td>
</tr>
<tr>
<td></td>
<td>66.0% (last anal sex; noncommercial casual partner; MSM; Mishwar 2008)</td>
</tr>
<tr>
<td>Morocco</td>
<td>16.0% (ever use; general population women; Chaouki et al. 1998)</td>
</tr>
<tr>
<td></td>
<td>9.0% (regular use; incarcerated women; El Ghrari et al. 2007)</td>
</tr>
<tr>
<td></td>
<td>10.0% (always; males; mainly IDUs; Asouab 2005; Morocco MOH [unknown])</td>
</tr>
<tr>
<td></td>
<td>8.1% (usually; males; mainly IDUs; Asouab 2005)</td>
</tr>
<tr>
<td></td>
<td>38.4% (rarely; males; mainly IDUs; Asouab 2005)</td>
</tr>
<tr>
<td></td>
<td>43.6% (never; males; mainly IDUs; Asouab 2005)</td>
</tr>
<tr>
<td></td>
<td>22.0% (always; females; mainly IDUs; Asouab 2005; Morocco MOH [unknown])</td>
</tr>
</tbody>
</table>
Table 8.2 (Continued)

<table>
<thead>
<tr>
<th>Country</th>
<th>Condom use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4.9% (usually; females; mainly IDUs; Asouab 2005)</td>
</tr>
<tr>
<td></td>
<td>29.3% (rarely; females; mainly IDUs; Asouab 2005)</td>
</tr>
<tr>
<td></td>
<td>43.9% (never; females; mainly IDUs; Asouab 2005)</td>
</tr>
<tr>
<td></td>
<td>59.0% (consistent; vaginal sex; FSWs; Alami 2009)</td>
</tr>
<tr>
<td></td>
<td>9.7% (almost always; vaginal sex; FSWs; Alami 2009)</td>
</tr>
<tr>
<td></td>
<td>22.2% (sometimes; vaginal sex; FSWs; Alami 2009)</td>
</tr>
<tr>
<td></td>
<td>26.1% (consistent; anal sex; FSWs; Alami 2009)</td>
</tr>
<tr>
<td></td>
<td>10.9% (almost always; anal sex; FSWs; Alami 2009)</td>
</tr>
<tr>
<td></td>
<td>13.0% (sometimes; anal sex; FSWs; Alami 2009)</td>
</tr>
<tr>
<td>Oman</td>
<td>53%–69% (ever use; IDUs; Oman MOH 2006)</td>
</tr>
<tr>
<td></td>
<td>12%–25% (always; IDUs; Oman MOH 2006)</td>
</tr>
<tr>
<td></td>
<td>68%–100% (last year; MSM; IDUs; Oman MOH 2006)</td>
</tr>
<tr>
<td>Pakistan</td>
<td>7.0% (contraceptive method; general population; Measure DHS 2007)</td>
</tr>
<tr>
<td></td>
<td>6.0% (ever use; general population; Raza et al. 1998)</td>
</tr>
<tr>
<td></td>
<td>10.0% (commercial sex; migrant workers; Faisal and Cleland 2006)</td>
</tr>
<tr>
<td></td>
<td>25.0% (sex with a female friend; migrant workers; Faisal and Cleland 2006)</td>
</tr>
<tr>
<td></td>
<td>3%–6% (last sex with a nonspousal partner; truck drivers; Agha 2000)</td>
</tr>
<tr>
<td></td>
<td>1.7% (last sex with FSW; truck drivers; Bokhari et al. 2007)</td>
</tr>
<tr>
<td></td>
<td>0.0% (last sex with male or hijra; truck drivers; Bokhari et al. 2007)</td>
</tr>
<tr>
<td></td>
<td>40.0% (ever use; IDUs; Emmanuel and Fatima 2008)</td>
</tr>
<tr>
<td></td>
<td>37.5% (ever use; IDUs; Lahore; Kuo et al. 2006)</td>
</tr>
<tr>
<td></td>
<td>14.2% (ever use; IDUs; Quetta; Kuo et al. 2006)</td>
</tr>
<tr>
<td></td>
<td>7.0% (ever use; IDUs; Parviz et al. 2006)</td>
</tr>
<tr>
<td></td>
<td>34.0% (ever use; IDUs; Altaf et al. 2007)</td>
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<tr>
<td></td>
<td>10.0% (ever use; IDUs; Haque et al. 2004)</td>
</tr>
<tr>
<td></td>
<td>17%–34% (last commercial sex; IDUs; Bokhari et al. 2007)</td>
</tr>
<tr>
<td></td>
<td>10%–25% (last anal sex sold to a man; IDUs; Bokhari et al. 2007)</td>
</tr>
<tr>
<td></td>
<td>22%–39% (last vaginal or anal sex sold to a woman; IDUs; Bokhari et al. 2007)</td>
</tr>
<tr>
<td></td>
<td>7%–13% (last anal sex paid to a man or hijra; IDUs; Bokhari et al. 2007)</td>
</tr>
<tr>
<td></td>
<td>46%–66% (not used last 6 months; nonpaid partners; IDUs; Pakistan National AIDS Control Program 2005)</td>
</tr>
<tr>
<td></td>
<td>49%–86% (not used last 6 months; commercial sex; IDUs; Pakistan National AIDS Control Program 2005)</td>
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<tr>
<td></td>
<td>45.0% (last sex; IDUs; Platt et al. 2009)</td>
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<tr>
<td></td>
<td>32.0% (last sex; IDUs; Platt et al. 2009)</td>
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<tr>
<td></td>
<td>17%–18% (always; FSWs; Pakistan National AIDS Control Program 2005)</td>
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<td></td>
<td>74%–81% (last month; FSWs; Pakistan National AIDS Control Program 2005)</td>
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<td>29%–48% (last sex; one-time client; FSWs; Bokhari et al. 2007)</td>
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<td>26%–47% (last sex; regular client; FSWs; Bokhari et al. 2007)</td>
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<tr>
<td></td>
<td>21.0% (last sex; noncommercial partners; FSWs; Bokhari et al. 2007)</td>
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<tr>
<td></td>
<td>17.0% (consistent last month; FSWs; Saleem, Adrien, and Razaque 2008)</td>
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<tr>
<td></td>
<td>68.0% (ever use; FSWs; Pakistan National AIDS Control Program 2005)</td>
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<tr>
<td></td>
<td>34.0% (last sex; noncommercial partners; FSWs; Pakistan National AIDS Control Program 2005)</td>
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<tr>
<td></td>
<td>18.0% (consistent last month; FSWs; Pakistan National AIDS Control Program 2005)</td>
</tr>
<tr>
<td></td>
<td>23.0% (consistent last month; FSWs; Pakistan National AIDS Control Program 2006–07)</td>
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<tr>
<td></td>
<td>34.0% (last vaginal sex; FSWs; Blanchard, Khan, and Bokhari 2008)</td>
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<tr>
<td></td>
<td>45.0% (last vaginal sex; FSWs; Pakistan National AIDS Control Program 2006–07)</td>
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<tr>
<td></td>
<td>38.0% (last commercial vaginal sex; FSWs; Hawkes et al. 2009)</td>
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<tr>
<td></td>
<td>12.0% (consistent last month during commercial vaginal sex; FSWs; Hawkes et al. 2009)</td>
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<tr>
<td></td>
<td>61.0% (last commercial anal sex; FSWs; Hawkes et al. 2009)</td>
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<tr>
<td></td>
<td>54.0% (last commercial oral sex; FSWs; Hawkes et al. 2009)</td>
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<tr>
<td></td>
<td>46.0% (last sex with husband; FSWs; Hawkes et al. 2009)</td>
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<tr>
<td></td>
<td>15.0% (consistent last month with husband; FSWs; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>7.9% (last anal sex; FSWs; Pakistan National AIDS Control Program 2006–07)</td>
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<tr>
<td></td>
<td>32.4% (last oral sex; FSWs; Pakistan National AIDS Control Program 2006–07)</td>
</tr>
<tr>
<td></td>
<td>3.1% (consistent; MSWs; Saleem, Adrien, and Razaque 2008)</td>
</tr>
</tbody>
</table>

(continued)
### Table 8.2 (Continued)

<table>
<thead>
<tr>
<th>Country</th>
<th>Condom use</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>24.0% (last anal sex; MSWs; Pakistan National AIDS Control Program 2005)</td>
</tr>
<tr>
<td></td>
<td>13.0% (last oral sex; MSWs; Pakistan National AIDS Control Program 2005)</td>
</tr>
<tr>
<td></td>
<td>34.0% (last commercial sex; MSWs; Pakistan National AIDS Control Program 2008)</td>
</tr>
<tr>
<td></td>
<td>32.5% (last sex; noncommercial partners; MSWs; Pakistan National AIDS Control Program 2008)</td>
</tr>
<tr>
<td></td>
<td>7.1% (consistent last month; MSWs; Pakistan National AIDS Control Program 2005)</td>
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<tr>
<td></td>
<td>8.0% (consistent last month; MSWs; Pakistan National AIDS Control Program 2006–07)</td>
</tr>
<tr>
<td></td>
<td>24.0% (consistent last month; commercial sex; MSWs; Pakistan National AIDS Control Program 2008)</td>
</tr>
<tr>
<td></td>
<td>22.2% (consistent last month; noncommercial partners; MSWs; Pakistan National AIDS Control Program 2008)</td>
</tr>
<tr>
<td></td>
<td>21.0% (last anal sex; HSWs; Pakistan National AIDS Control Program 2005)</td>
</tr>
<tr>
<td></td>
<td>15.0% (last oral sex; HSWs; Pakistan National AIDS Control Program 2005)</td>
</tr>
<tr>
<td></td>
<td>32.3% (last commercial sex; HSWs; Pakistan National AIDS Control Program 2008)</td>
</tr>
<tr>
<td></td>
<td>26.0% (last sex; noncommercial partners; HSWs; Pakistan National AIDS Control Program 2008)</td>
</tr>
<tr>
<td></td>
<td>7.5% (consistent last month; HSWs; Pakistan National AIDS Control Program 2005)</td>
</tr>
<tr>
<td></td>
<td>5.6% (consistent last month; HSWs; Pakistan National AIDS Control Program 2006–07)</td>
</tr>
<tr>
<td></td>
<td>19.7% (consistent last month; commercial sex; HSWs; Pakistan National AIDS Control Program 2008)</td>
</tr>
<tr>
<td>Somalia</td>
<td>20%–52% (ever use; hijras; Pakistan National AIDS Control Program 2005)</td>
</tr>
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<td></td>
<td>20.0% (ever use; hijras; Baqi et al. 1999)</td>
</tr>
<tr>
<td></td>
<td>4.0% (consistent; hijras; Saleem, Adrien, and Razaque 2008)</td>
</tr>
<tr>
<td></td>
<td>18.0% (last sex; one-time client; hijras; Khan et al. 2008)</td>
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<tr>
<td></td>
<td>12.0% (last receptive anal sex; one-time client; hijras; Khan et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>15.0% (last sex; regular client; hijras; Khan et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>13.0% (last receptive anal sex; regular client; hijras; Khan et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>9.0% (last sex; MSWs; Bokhari et al. 2007)</td>
</tr>
<tr>
<td></td>
<td>17.0% (last month; nonpaying female; MSWs; Bokhari et al. 2007)</td>
</tr>
<tr>
<td></td>
<td>23.0% (last commercial anal sex; banthas; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>31.0% (last commercial anal sex; khotkis; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>25.0% (last commercial anal sex; khusras; Hawkes et al. 2009)</td>
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<tr>
<td></td>
<td>10.0% (consistent last month during commercial anal sex; banthas; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>8.0% (consistent last month during commercial anal sex; khotkis; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>4.0% (consistent last month during commercial anal sex; khusras; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>10.0% (last commercial oral sex; banthas; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>8.0% (last commercial oral sex; khotkis; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>4.0% (last commercial oral sex; khusras; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>0.0% (last sex with gyria; banthas; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>27.0% (last sex with gyria; khotkis; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>7.0% (last sex with gyria; khusras; Hawkes et al. 2009)</td>
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<tr>
<td></td>
<td>0.0% (consistent last month with gyria; banthas; Hawkes et al. 2009)</td>
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<tr>
<td></td>
<td>8.0% (consistent last month with gyria; khotkis; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>7.0% (consistent last month with gyria; khusras; Hawkes et al. 2009)</td>
</tr>
<tr>
<td>Sudan</td>
<td>12.7% (ever use; general population men; WHO 2004)</td>
</tr>
<tr>
<td></td>
<td>5.0% (ever use; general population women; WHO 2004)</td>
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<tr>
<td></td>
<td>2.6% (recent use; general population; Scott et al. 1991)</td>
</tr>
<tr>
<td></td>
<td>14.0% (last sex; general population women; WHO/EMRO 2000)</td>
</tr>
<tr>
<td></td>
<td>15.2% (last sex; general population men; WHO/EMRO 2000)</td>
</tr>
<tr>
<td></td>
<td>10.3% (last sex; merchants/drivers; WHO/EMRO 2000)</td>
</tr>
<tr>
<td></td>
<td>5.8% (ever use; street children; Ahmed 2004h)</td>
</tr>
<tr>
<td></td>
<td>6.2% (ever use; university students; Ahmed 2004i)</td>
</tr>
<tr>
<td></td>
<td>37.6% (ever use; university students; Sudan National HIV/AIDS Control Program 2004)</td>
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<tr>
<td></td>
<td>3.6% (consistent; university students; Sudan National HIV/AIDS Control Program 2004)</td>
</tr>
<tr>
<td></td>
<td>1.2% (last sex; rural population females; SNAP, UNICEF, and UNAIDS 2005)</td>
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<tr>
<td></td>
<td>2.2% (last sex; rural population males; SNAP, UNICEF, and UNAIDS 2005)</td>
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<tr>
<td></td>
<td>3.0% (last year; general population; Southern Sudan; NSNAC and UNAIDS 2006)</td>
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<tr>
<td></td>
<td>2.0% (last sex with casual partner; general population; Sudan National HIV/AIDS Control Program 2004)</td>
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<tr>
<td>Country</td>
<td>Condom use</td>
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<tr>
<td></td>
<td>2.7% (ever use; ANC women attendees; Ahmed 2004b)</td>
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<tr>
<td></td>
<td>5.0% (last sex with spouse; men; Southern Sudan; UNHCR 2007)</td>
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<tr>
<td></td>
<td>1.0% (last sex with spouse; women; Southern Sudan; UNHCR 2007)</td>
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<tr>
<td></td>
<td>31.0% (last sex with spouse; refugees; men; Southern Sudan; UNHCR 2007)</td>
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<td>5.0% (last sex with spouse; refugees; women; Southern Sudan; UNHCR 2007)</td>
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<tr>
<td></td>
<td>46.3% (last sex with casual partner; men; Southern Sudan; UNHCR 2007)</td>
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<td></td>
<td>0.0% (last sex with casual partner; women; Southern Sudan; UNHCR 2007)</td>
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<tr>
<td></td>
<td>22.5% (consistent with casual partner; men; Southern Sudan; UNHCR 2007)</td>
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<tr>
<td></td>
<td>0.0% (consistent with casual partner; women; Southern Sudan; UNHCR 2007)</td>
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<tr>
<td></td>
<td>0.0% (last sex with commercial partner; men; Southern Sudan; UNHCR 2007)</td>
</tr>
<tr>
<td></td>
<td>0.0% (last sex with commercial partner; women; Southern Sudan; UNHCR 2007)</td>
</tr>
<tr>
<td></td>
<td>16.0% (ever use among sexually active; men; Southern Sudan; UNHCR 2007)</td>
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<tr>
<td></td>
<td>3.0% (ever use among sexually active; women; Southern Sudan; UNHCR 2007)</td>
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<tr>
<td></td>
<td>1.0% (ever use; tea sellers; Ahmed 2004j)</td>
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<tr>
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<td>3.0% (ever use; internally displaced persons; IGAD 2006)</td>
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<tr>
<td></td>
<td>5.0% (ever use; internally displaced persons; Ahmed 2004c)</td>
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<td>0.0% (ever use; Sudanese women refugees; Holt et al. 2003)</td>
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<td>8.9% (ever use; truck drivers; Farah and Hussein 2006)</td>
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<tr>
<td></td>
<td>2.4% (ever use; truck drivers; Ahmed 2004k)</td>
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<tr>
<td></td>
<td>2.7% (ever use; military personnel; Ahmed 2004d)</td>
</tr>
<tr>
<td></td>
<td>4.0% (ever use; prisoners; Ahmed 2004e)</td>
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<tr>
<td></td>
<td>15.8% (ever use; prisoners; Assal 2006)</td>
</tr>
<tr>
<td></td>
<td>1.7% (ever use; TB patients; Ahmed 2004i)</td>
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<tr>
<td></td>
<td>5.4% (ever use; STD clinic attendees; Ahmed 2004g)</td>
</tr>
<tr>
<td></td>
<td>0.0% (ever use; suspected AIDS patients; Ahmed 2004a)</td>
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<tr>
<td></td>
<td>10.4% (ever used; military personnel; Sudan National HIV/AIDS Control Program 2004)</td>
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<tr>
<td></td>
<td>1.7% (consistent; military personnel; Sudan National HIV/AIDS Control Program 2004)</td>
</tr>
<tr>
<td></td>
<td>2.0% (last sex; clients of FSWs; SNAP, UNICEF, and UNAIDS 2005)</td>
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<tr>
<td>Syrian Arab Republic</td>
<td>2.1% (regularly; FSWs and tea sellers; Basha 2008)</td>
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<td>10.3% (ever use; FSWs; Ahmed 2004f)</td>
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<tr>
<td></td>
<td>16.7% (ever use; FSWs; Youisif 2006)</td>
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<td>13.0% (regularly; FSWs; Ati 2005)</td>
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<td>24.6% (ever use; FSWs; ACORD 2006)</td>
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<td></td>
<td>57.8% (ever use; FSWs; Ati 2005)</td>
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<td>23.0% (ever use; FSWs; Anonymous 2007)</td>
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<td>86.2% (ever use; MSM; Elrashied 2006)</td>
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<tr>
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<td>50.9% (every time or almost every time; MSM; Elrashied 2006)</td>
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<tr>
<td></td>
<td>58.5% (last commercial sex; MSM; Elrashied 2006)</td>
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<td></td>
<td>48.5% (last noncommercial sex; MSM; Elrashied 2006)</td>
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<td></td>
<td>72.9% (ever use; MSM; Elrashied 2006)</td>
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<tr>
<td></td>
<td>89.4% (last six months; female partners; MSM; Elrashied 2006)</td>
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<tr>
<td>Tunisia</td>
<td>65.0% (ever use; FSWs; Hassen et al. 2003)</td>
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<tr>
<td></td>
<td>37.0% (always; FSWs; Hassen et al. 2003)</td>
</tr>
<tr>
<td></td>
<td>27.0% (sometimes; FSWs; Hassen et al. 2003)</td>
</tr>
<tr>
<td></td>
<td>46.4% (last nonpaid sex; MSM; Hsairi and Ben Abdallah 2007)</td>
</tr>
</tbody>
</table>

(continued)
partner refusal, pharmacies are too far, not thinking of them as necessary, or fear of imprisonment if caught possessing them (such as for FSWs and MSM). 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.

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. 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.

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. 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.

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. 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. Men in MENA also appear to have a negative attitude toward condom use.

### 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.

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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 Hajjiabdolbaghi et al., “Insights from a Survey”; Roudi, “Iran’s Revolutionary Approach.”
16 Mehryar, Ahmad-Nia, and Kazemipour, “Reproductive Health in Iran.”
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. In Pakistan, 86.8% of migrant workers had heard of HIV/AIDS. 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. 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. In Egypt, only 6.1% of ever-married women had comprehensive knowledge of HIV/AIDS. In Somalia, only 4% of young women had comprehensive knowledge of HIV/AIDS. Many people may have heard of HIV/AIDS, but are unaware of its different transmission modes and clinical manifestations of infection and disease. 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. 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 Iran and prisoners, FSWs, MSM, and injecting drug users (IDUs) in Lebanon. Comparing knowledge, attitudes, and practices (KAP) surveys in Sudan from 2002 and 2005 found a substantial improvement in HIV/AIDS knowledge. 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. In the Islamic Republic of Iran, one-third of high school students believed that HIV can be transmitted by mosquitoes. In Saudi Arabia, 49% of health care workers (HCWs) identified casual kissing as a transmission mode. In Sudan, one-fifth of antenatal clinic (ANC) attendees believed they could acquire HIV by sharing a meal with an HIV-positive person. 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%

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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 Abdolfotouh, “The Impact of a Lecture”;
24 Farghaly and Kamal, “Study of the Opinion and Level of Knowledge about AIDS.”
25 Measure DHS, “Egypt: Demographic and Health Survey 2005.”
27 UNAIDS, “Key Findings.”
28 Montazeri, “AIDS Knowledge and Attitudes.”
30 SNAP, UNICEF, and UNAIDS, “Baseline Study on Knowledge.”
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. In Jordan, 82% of general population women reported not being at risk for HIV at all. In the Republic of Yemen, 95.1% of secondary school students believed that young people are not susceptible to HIV infection.

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. The stigma, discrimination, and phobia are most worrying among HCWs. There is an environment of risk exaggeration in dealing with PLHIV, such as among nurses in both Egypt and the Islamic Republic of Iran. Over half of Kuwaiti physicians would avoid contact with PLHIV. 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. Fear of stigmatization and feelings of anxiety, hopelessness, and depression are frequently reported by PLHIV. High profile violations of basic rights of PLHIV have been widely reported. The rights to confidentiality and consent are repeatedly violated. Several aspects of human sexuality are deemed unacceptable. The attitudes toward PLHIV depend strongly on the social acceptability of the transmission mode by which people become infected. Religiosity has been associated with both positive and negative attitudes toward PLHIV.

The negative attitudes may be due in part to the invisible nature of the epidemic. 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. 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. 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, and 95% said that patients with AIDS-related illness deserve respect as human beings. In Libya, 91% of high school students supported providing free care to PLHIV. In Morocco, 68% of general population women said they would take care of PLHIV. 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 to 29% in 1999, and to 34.3% in 2005.

References:

40. Askarian et al., “Knowledge about HIV Infection.”
41. Shouman and Fotouh, “The Impact of Health Education.”
43. DeJong et al., “The Sexual and Reproductive Health.”
44. Kabbash et al., “Needs Assessment.”
45. Moszynski, “Egyptian Doctors.”
47. Mohammadi et al., “Reproductive Knowledge, Attitudes and Behavior.”
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. Mazloomy and Baghianimoghadam, “Knowledge and Attitude”; Hedayati-Moghaddam, “Knowledge of and Attitudes.”
54. Montazeri, “AIDS Knowledge and Attitudes in Iran.”
55. IRIB, “Poll of Tehran Public on AIDS (2006).”
56. El-Gadi, Abudher, and Sammud, “HIV-Related Knowledge and Stigma.”
57. Zidouh, “VIH/SIDA et Infections sexuellement transmissibles.”
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

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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 Measure DHS, “Egypt: Demographic and Health Survey 2005.”
66 SNAPP, UNICEF, and UNAIDS, “Baseline Study on Knowledge.”
68 Lynn, “Pakistan Launches Media Blitz on AIDS.”
69 El-Baky and Hess, “Mass Media Makes a Difference.”
71 Karimi and Ataei, “The Assessment of Knowledge.”
72 Yazdi et al., “Knowledge, Attitudes and Sources of Information.”
73 Al-Serouri, “Assessment of Knowledge.”
74 Gharamah and Baktayan, “Exploring HIV/AIDS Knowledge.”
75 Raja and Farhan, “Knowledge and Attitude.”
Bucking the trend, several studies have documented the opposite tendency, probably reflecting female mass education gains over the last few decades. In Afghanistan, female university students were more knowledgeable than males. In the Islamic Republic of Iran, HIV/AIDS knowledge among female high school students was found to be higher than that of males. In further studies of college students and the general population in the Islamic Republic of Iran, of high school students in Libya, and of high school students 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 Egypt, 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.

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. In Jordan these percentages were 70.1, 54.6, and 42.3, respectively. In Morocco, 58% knew of the risk of transmission through breastfeeding. However, in Sudan, only 4.3% to 39.8% of diverse population groups reported knowing about the risk of mother-to-child transmission. 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.

Finally, it appears that knowledge of STIs other than HIV is substantially lower than that of HIV/AIDS. While 98% of women in Egypt knew of HIV/AIDS, only 21.8% knew of other STIs. In Jordan, only 27.4% of women knew of other STIs, and in Morocco, 69% of general population women declared that they do not know of other STIs. However, a study among a general population in Southern Sudan found that 90% have heard of STIs.

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. 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. 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

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90 Roudi-Fahimi and Moghadam, “Empowering Women, Developing Society.”
91 Mansoor et al., “Gender Differences in KAP.”
92 Karimi and Ataei, “The Assessment of Knowledge.”
93 Yazdi et al., “Knowledge, Attitudes and Sources of Information.”
94 Nasrha, “Prisoners’ Knowledge.”
95 Simbar, Tehrani, and Hashemi, “Reproductive Health Knowledge.”
96 El-Gadi, Abudher, and Sammud, “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-Sarour, “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.”
exchange with widespread disregard for safe sex.\textsuperscript{113} There are, however, some encouraging trends, such as in the Islamic Republic of Iran, where more emphasis is placed on safe sex.\textsuperscript{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.\textsuperscript{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.\textsuperscript{116} HIV/AIDS information is normally acquired through mass media or personal experiences rather than awareness programs.\textsuperscript{117} Media and peers may not provide accurate information on sexual health.\textsuperscript{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.\textsuperscript{119} Peers, teachers, and HCWs are also cited as preferred sources of HIV/AIDS knowledge.\textsuperscript{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.\textsuperscript{121} Group education and individual counseling programs have been proven useful in increasing knowledge in Egypt,\textsuperscript{122} the Islamic Republic of Iran,\textsuperscript{123} Saudi Arabia,\textsuperscript{124} and Sudan.\textsuperscript{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.\textsuperscript{126} Well-designed peer education programs may also be effective considering the dense social and family networks in MENA.\textsuperscript{127} Peer group education has been found effective among prisoners in the Islamic Republic of Iran.\textsuperscript{128}

BIBLIOGRAPHY


\textsuperscript{113} Chemtob et al., “Getting AIDS.”

\textsuperscript{114} Kalkhoran and Hale, “AIDS Education in an Islamic Nation.”

\textsuperscript{115} World Bank, \textit{HIV/AIDS in Afghanistan}.

\textsuperscript{116} Gruenseit, “Impact of HIV.”

\textsuperscript{117} Tehrani and Malek-Afzalip, “Knowledge, Attitudes and Practices.”

\textsuperscript{118} El-Kak et al., “High School Students.”

\textsuperscript{119} Farah and Hussein, “HIV Prevalence”; Al-Serouri, “Assessment of Knowledge.”

\textsuperscript{120} Al-Serouri, “Assessment of Knowledge”; Mohammadi et al., “Reproductive Knowledge.”

\textsuperscript{121} Ergene et al., “A Controlled-Study”; Khan, “Country Watch: Pakistan.”

\textsuperscript{122} Salama et al., “HIV/AIDS Knowledge and Attitudes.”

\textsuperscript{123} Jodati et al., “Impact of Education.”

\textsuperscript{124} Saleh et al., “Impact of Health Education.”

\textsuperscript{125} Yousef, “Health Education Programme.”

\textsuperscript{126} Yazdi et al., “Knowledge, Attitudes and Sources of Information”; Jodati et al., “Impact of Education.”

\textsuperscript{127} Ergene et al., “A Controlled-Study”; Jodati et al., “Impact of Education.”

\textsuperscript{128} Afshar, “From the Assessment to the Implementation of Services.”


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), 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 Yemen), and temporary and casual workers.

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, 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. Imprisonment and repeated imprisonments are common among IDUs. Outbreaks of HIV among prisoners driven by

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1 Tchupo, Les maladies sexuellement transmissibles.
3 Parker, Easton, and Klein, “Structural Barriers and Facilitators in HIV Prevention.”
4 Gaughwin, Douglas, and Wodak, “Behind Bars.”
5 Delan 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 prisoners in MENA include injecting and noninjecting drug use, tattooing, sharing of razors, unprotected

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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.
21 Dolan et al., “HIV in Prison.”
22 Ibid.
23 Dolan et al., “HIV in Prison.”
25 Iran Prison Organization, “Health and Treatment Headquarter.”
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

<table>
<thead>
<tr>
<th>Country</th>
<th>Imprisonment (per 100,000)</th>
<th>HIV prevalence in prisons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>30 (International Centre for Prison Studies 2006)</td>
<td></td>
</tr>
<tr>
<td>Algeria</td>
<td>158 (International Centre for Prison Studies 2006)</td>
<td></td>
</tr>
<tr>
<td>Bahrain</td>
<td>95 (International Centre for Prison Studies 2006)</td>
<td></td>
</tr>
<tr>
<td>Djibouti</td>
<td>61 (Dolan et al. 2007; International Centre for Prison Studies 2006)</td>
<td>6.1% (Shrestha 1999)</td>
</tr>
<tr>
<td>Egypt, Arab Republic of</td>
<td>About 121 (Dolan et al. 2007; International Centre for Prison Studies 2006)</td>
<td>0.0% (El-Ghazzawi, Hunsmann, and Schneider 1987)</td>
</tr>
<tr>
<td>Iran, Islamic Republic of</td>
<td>191 (Dolan et al. 2007; International Centre for Prison Studies 2006)</td>
<td>2% (UNAIDS and WHO 2002; UNAIDS 2002)</td>
</tr>
<tr>
<td></td>
<td>185 (Burrows, Wodak, and WHO 2005)</td>
<td>1.4% (UNAIDS and WHO 2001)</td>
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<tr>
<td></td>
<td></td>
<td>2.3% (UNAIDS and WHO 2001)</td>
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<tr>
<td></td>
<td></td>
<td>12% (UNAIDS and WHO 2002)</td>
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<tr>
<td></td>
<td></td>
<td>2.1% (mostly IDUs; Afshar [unknown (a)])</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.3% (mostly IDUs; Afshar [unknown (a)])</td>
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<tr>
<td></td>
<td></td>
<td>3.3% (mostly IDUs; Afshar [unknown (a)])</td>
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<tr>
<td></td>
<td></td>
<td>0.9% (injecting and noninjecting drug users; Alizadeh et al. 2005)</td>
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<tr>
<td></td>
<td></td>
<td>24.4% (IDUs; Jahani et al. 2009)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.0% (IDUs; Rahbar, Rooholamini, and Khoshnood 2004)</td>
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<tr>
<td></td>
<td></td>
<td>22.0% (IDUs; Farhoudi et al. 2003)</td>
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<tr>
<td></td>
<td></td>
<td>24.0% (IDUs; Farhoudi et al. 2003)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12.0% (UNAIDS and WHO 2002)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Up to 63.0% (UNAIDS 2002)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>22–25% (Spaulding et al. 2002)</td>
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<tr>
<td></td>
<td></td>
<td>6% (Spaulding et al. 2002)</td>
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<tr>
<td></td>
<td></td>
<td>2.5% (Ghannad et al. 2009)</td>
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<tr>
<td></td>
<td></td>
<td>2.4% (Ghannad et al. 2009)</td>
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<tr>
<td></td>
<td></td>
<td>1.9% (Ghannad et al. 2009)</td>
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<tr>
<td></td>
<td></td>
<td>2.3% (Ghannad et al. 2009)</td>
</tr>
<tr>
<td>Iraq</td>
<td>About 60 (Dolan et al. 2007; International Centre for Prison Studies 2006)</td>
<td>0.0% (Shrestha 1999)</td>
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<tr>
<td></td>
<td></td>
<td>0.0% (Jordan National AIDS Program, personal communication)</td>
</tr>
<tr>
<td>Jordan</td>
<td>104 (International Centre for Prison Studies 2006)</td>
<td>0.0% (Jordan National AIDS Program, personal communication)</td>
</tr>
<tr>
<td>Kuwait</td>
<td>130 (International Centre for Prison Studies 2006)</td>
<td></td>
</tr>
<tr>
<td>Lebanon</td>
<td>145 (Dolan et al. 2007; International Centre for Prison Studies 2006)</td>
<td>0.7% (Shrestha 1999)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.16% (Mishwar 2008)</td>
</tr>
<tr>
<td>Libya</td>
<td>207 (Dolan et al. 2007; International Centre for Prison Studies 2006)</td>
<td>18.0% (Sammud 2005)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60.0% (detention for treatment; Dolan et al. 2007)</td>
</tr>
</tbody>
</table>

(continued)
<table>
<thead>
<tr>
<th>Country</th>
<th>Imprisonment (per 100,000)</th>
<th>HIV prevalence in prisons</th>
</tr>
</thead>
</table>
| 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)  
0.7% (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)               | 0.0% (Ahmed 1997)   |
| 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    | 298 (International Centre for Prison Studies 2006)              | 26.5% (Shrestha 1999) |
| 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) coinfected 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

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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 Razaghi, 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.”
42 El Ghari 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.”
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.”
51 Bolhari and Mirzamani, “Assessment of Substance Abuse in Iran’s Prisons.”
continue their drug use in prison,\textsuperscript{52} while another reported that 85% of IDUs used drugs in prison.\textsuperscript{53} A study found that 28% of community-based IDUs with a history of incarceration have injected drugs in prisons,\textsuperscript{54} and another reported that 9.7% of drug-using inmates continued to use drugs, mostly heroin, while in prison.\textsuperscript{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.\textsuperscript{56} About 25%–30% of prisoners used drugs in prison in one study,\textsuperscript{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.\textsuperscript{58} In further studies, 91% of IDUs and non-injecting drug users ever imprisoned reported using drugs while in prison,\textsuperscript{59} and 18.9% and 6.1% reported using opioid and injecting drugs while in prison, respectively.\textsuperscript{60}

Other studies have also observed IDU in prisons in other MENA countries. In Algeria, 67% of those incarcerated reported using drugs in prison.\textsuperscript{61} In the Arab Republic of Egypt, about 25% of IDUs who had been incarcerated reported injecting drugs in prison.\textsuperscript{62} In Lebanon, only 0.16% of prisoners, including IDUs, reported injecting while in prison.\textsuperscript{63} In Oman, 26%–44% of IDUs reported drug use in prison and 5%–11% reported injecting drugs in prison.\textsuperscript{64} In Syria, 11% of imprisoned IDUs injected drugs in prison.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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%,\textsuperscript{69} 29.9%,\textsuperscript{70} and 37.1%\textsuperscript{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,\textsuperscript{72} and 23% of community-based IDUs reported using nonsterile drug injection utensils in prison.\textsuperscript{73} Twenty-three percent of prisoners in another study used drugs mostly with nonsterile and handmade utensils.\textsuperscript{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.\textsuperscript{75} In Oman, 3%–11% reported using nonsterile needles in prison.\textsuperscript{76} In Sudan, 3.2% of prisoners reported using nonsterile syringes while in prison.\textsuperscript{77} In Syria, the majority of IDUs who injected in prison did so by using a nonsterile syringe or a needle.\textsuperscript{78}
This evidence of nonsterile injection equipment use in prison is further supported by the repeated confiscation of injecting equipment in MENA prisons.\textsuperscript{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.\textsuperscript{80} It has been reported that syringes are used at least 30 to 40 times in Iranian prisons before disposal.\textsuperscript{81}

Tattooing is a risk factor for HIV infection,\textsuperscript{82} and there is evidence of tattooing using nonsterile utensils in Iranian prisons.\textsuperscript{83} About 65% of imprisoned IDUs have tattoos,\textsuperscript{84} and tattooing was reported by 24.9%–25.1% of Iranian prisoners.\textsuperscript{85} Two studies in the Islamic Republic of Iran have also identified tattooing as a risk factor for HCV infection for incarcerated IDUs.\textsuperscript{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,\textsuperscript{87} and 5.4% of incarcerated male IDUs reported sex with another male while in prison.\textsuperscript{88} Sexual abuse of prisoners by other prisoners has also been reported in the Islamic Republic of Iran.\textsuperscript{89} In Lebanon, 2.6% of male prisoners reported anal sex with another male while in prison.\textsuperscript{90} In Oman, 6%–18% of male IDUs reported having sex in prison without condoms.\textsuperscript{91} In Pakistan, 4% of male prisoners reported having sex with other males.\textsuperscript{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.\textsuperscript{93} The latter assertion is corroborated by the fact that 14.5% of prisoners have been diagnosed with gonorrhea while incarcerated.\textsuperscript{94} In Syria, 5% of imprisoned drug users reported ever having sex in prison.\textsuperscript{95}

Anecdotal evidence in Sudan suggests the occurrence of sexual acts between female prisoners and their guards in exchange for better treatment in prison.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{99} Another study in Sudan found that 65.2% of prisoners had extramarital relations prior to incarceration.\textsuperscript{100} Though by law prisoners in Sudan have the right to conjugal visits, this right is rarely practiced.\textsuperscript{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

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\textsuperscript{79} Bolhari and Mirzamani, “Assessment of Substance Abuse in Iran’s Prisons.”
\textsuperscript{80} Rahbar, Rooholamini, and Khoshnood, “Prevalence of HIV Infection.”
\textsuperscript{81} Nassirimanesh, Trace, and Roberts, “The Rise of Harm Reduction.”
\textsuperscript{82} Martin et al., “Predictive Factors of HIV-Infection”; Buavirat et al., “Risk of Prevalent HIV.”
\textsuperscript{83} Zamani et al., “High Prevalence of HIV.”
\textsuperscript{84} Afshar, “From the Assessment to the Implementation of Services.”
\textsuperscript{85} Farhoodi et al., “Human Immunodeficiency Virus.”
\textsuperscript{86} Khani and Vakili, “Prevalence and Risk Factors of HIV”; Kheirandish et al., “Prevalence and Correlates of Hepatitis C Infection.”
\textsuperscript{87} Bolhari and Mirzamani, “Assessment of Substance Abuse in Iran’s Prisons.”
\textsuperscript{88} Zamani et al., “Needle and Syringe Sharing Practices.”
\textsuperscript{89} Afshar, “From the Assessment to the Implementation of Services.”
\textsuperscript{90} Mishwar, “An Integrated Bio-Behavioral Surveillance Study.”
\textsuperscript{91} Oman MOH, “HIV Risk among Heroin and Injecting Drug Users.”
\textsuperscript{92} Khawaja et al., “HIV/AIDS and Its Risk Factors in Pakistan.”
\textsuperscript{93} Ati, “HIV/AIDS/STIs Social and Geographical Mapping.”
\textsuperscript{94} Ibid.
\textsuperscript{95} Syria Mental Health Directorate, “Assessment of HIV Risk and Sero-Prevalence.”
\textsuperscript{96} Ati, “HIV/AIDS/STIs Social and Geographical Mapping.”
\textsuperscript{97} El Ghrari et al., “Prevalence of Syphilis and HIV.”
\textsuperscript{98} Ahmed, *Prisoners.*
\textsuperscript{99} Assal, “HIV Prevalence.”
\textsuperscript{100} Ati, “HIV/AIDS/STIs Social and Geographical Mapping.”
\textsuperscript{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.\textsuperscript{102}

**YOUTH AND HIV**

MENA is distinctively characterized by a “tidal wave” of youth; one-fifth of the population, 95 million people,\textsuperscript{103} are in the 15–24 years age group,\textsuperscript{104} the average age range of initiation of sexual activities.\textsuperscript{105} This is the largest youth cohort in the region’s history and the largest vulnerable population in MENA.\textsuperscript{106}

Youth are experiencing high rates of unemployment, delayed marital age, increased pre-marital sex, conflict morbidity and mortality, increased mobility, peer pressure to engage in risky behavior, and changing lifestyle norms.\textsuperscript{107} The increasing high educational attainment of youth, coupled with high unemployment, is leading to a structural vulnerability of rising expectations but declining opportunities.\textsuperscript{108} There is a widening generation gap between young people on one hand, and their parents and decision makers on the other hand.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{112} Young people are also the best vehicle for change if they can be reached with appropriate interventions.\textsuperscript{113} The countries that reported the largest declines in risky behavior and HIV prevalence, such as Uganda, observed the biggest changes among youth.\textsuperscript{114}

**Demography**

The share of youth 15–24 years of age ranges between 15% and 25% among the countries of the region.\textsuperscript{115} In Egypt and Morocco, about one-third of the population is between 15 and 29 years of age.\textsuperscript{116} In Jordan, 70% of the population is below the age of 25.\textsuperscript{117} In the West Bank and Gaza, 52% of the population is below the age of 18.\textsuperscript{118} In Sudan, 45% of the population is under the age of 15.\textsuperscript{119} In the Republic of Yemen, 46.2% of the population is below age 15 and 58.3% is below age 19.\textsuperscript{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,\textsuperscript{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.\textsuperscript{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.\textsuperscript{123}

\textsuperscript{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.”

\textsuperscript{103} Assaad and Roudi-Fahimi, “Youth in the Middle East and North Africa.”

\textsuperscript{104} UNAIDS, “Notes on AIDS in the Middle East and North Africa”; Roudi-Fahimi and Ashford, “Sexual & Reproductive Health.”


\textsuperscript{106} Assaad and Roudi-Fahimi, “Youth in the Middle East and North Africa.”

\textsuperscript{107} Busulwa, “HIV/AIDS Situation Analysis Study”; UNAIDS, “Notes on AIDS in the Middle East and North Africa.”

\textsuperscript{108} Jenkins and Robalino, “HIV in the Middle East and North Africa.”

\textsuperscript{109} Assaad and Roudi-Fahimi, “Youth in the Middle East and North Africa.”

\textsuperscript{110} Monasch and Mahy, “Young People.”

\textsuperscript{111} Ibid.


\textsuperscript{113} Monasch and Mahy, “Young People.”

\textsuperscript{114} Ibid.

\textsuperscript{115} Assaad and Roudi-Fahimi, “Youth in the Middle East and North Africa.”

\textsuperscript{116} Jenkins and Robalino, “HIV in the Middle East and North Africa.”

\textsuperscript{117} UNAIDS, “HIV Prevention in Jordan.”

\textsuperscript{118} UNAIDS, “Key Findings on HIV Status.”

\textsuperscript{119} Gutbi and Eldin, “Women Tea-Sellers in Khartoum and HIV/AIDS.”

\textsuperscript{120} Lambert, “HIV and Development Challenges in Yemen.”

\textsuperscript{121} Rashad, “Demographic Transition in Arab Countries.”

\textsuperscript{122} Assaad and Roudi-Fahimi, “Youth in the Middle East and North Africa.”

\textsuperscript{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.112 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

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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.”
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.”
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.\textsuperscript{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.\textsuperscript{151} In Lebanon, about one out of five men and women aged 35–39 years was still single in 1996.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{155} In large part, the demographic transition in MENA is driven by stark changes in nuptiality.\textsuperscript{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.\textsuperscript{157} Drug use in different forms appears to be considerable and probably increasing among youth in MENA.\textsuperscript{158} The profile of IDUs in a Tunisian study was that of young men raised in large families shattered by urban-rural migration.\textsuperscript{159} Among young prisoners in the Islamic Republic of Iran, 33.9% of inmates used opioid while in prison.\textsuperscript{160} IDUs in Oman reported hashish as their first drug at a mean age of 18, and then IDU of heroin at age 22.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{164} Peer pressure was found to be a key determinant of starting drug use among these adolescents.\textsuperscript{165} The knowledge of harm was generally poor and multiple use of different drugs was reported by a considerable share of these users.\textsuperscript{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.\textsuperscript{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.\textsuperscript{168} MSM tend to start having sex at a younger age compared to males who have sex with females.\textsuperscript{169} In Lebanon, 54% of MSM reported having their first anal sex at under the age of 18 years.\textsuperscript{170} In Egypt, young MSM were the group that changed their sexual partners most often among MSM.\textsuperscript{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.\textsuperscript{172} In studies in Pakistan, male sex workers (MSWs) had an average age of 22.3,\textsuperscript{173} 21.3,\textsuperscript{174} and 21.7 years, and started
commercial sex at an average age of 16.9, 15.9, 15.7, and 16.2 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. Further studies among FSWs in Sudan have found that the majority are under 30 years of age, 19.6% are less than 18 years of age, and the majority are younger than 28 years and started sex work before 22 years of age. Fifty-three percent of FSWs in a study in Syria were 25 years of age or younger. In Djibouti, 63% of FSWs reported their first commercial sex at under 20 years of age. In Lebanon, 57% of FSWs reported first sex at ages between 11 and 18 years. In Pakistan, young FSWs were found to have the highest client volume. Also in Pakistan, the median age of initiating sex work was reported to be 22 years of age.

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. Almost 41% of HIV infections in the Islamic Republic of Iran are found in the 25–34 years age group, and 27.9% of youth report a previous history of STDs. 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.

Most reported STDs among STD clinic attendees in Kuwait were in the age range of 21–30 years. The age group most affected by HIV in Jordan is the 15–35 years age group. 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. 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. Forty percent of recorded STD cases in Morocco were among youth ages 15–29 years. Most HIV infections in Morocco (63%) and Tunisia (93%) are among single and often young persons.

The highest prevalence of both HIV and syphilis in Somalia (4%) was in the 15–24 years age group. Forty-seven percent of HIV cases in the ANC HIV sentinel sero-survey in Sudan were in the 20–24 years age group. Also in Sudan, HIV prevalence among youth is estimated to be 1% among females and 0.3% among males. The dominant profile of STD clinic attendees in Tunisia was that of young single men with multiple sexual partners.

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. 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).
181 Yousif, Health Education Programme.
182 ACORD, “Qualitative Socio Economic Research.”
186 Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Round I).
189 Iran Center for Disease Management, Three Month Statistics of the MoH AIDS Office.
190 Al-Mutairi et al., “Clinical Patterns.”
191 Anonymous, Scaling Up the HIV Response.
192 UNAIDS, “Key Findings on HIV Status.”
193 Roudi-Fahimi and Ashford, “Sexual & Reproductive Health.”
194 Roudi-Fahimi and Ashford, “Sexual & Reproductive Health.”
195 Jenkins and Robalino, “HIV in the Middle East and North Africa.”
196 Jenkins and Robalino, “HIV in the Middle East and North Africa.”
199 SNAP, “Update on the HIV Situation in Sudan.”
200 Sellami et al., “Epidemiologic Profile.”
201 Mansoor et al., “Gender Differences in KAP.”
being sexually active (40.8% of males and 2.7% of females). 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.

In Egypt, 26% of male and 3% of female university students reported having sexual intercourse. In another study, 16.5% of university students engaged in sexual intercourse, and in a third, 18% of the students reported engaging in risky sexual behavior. Low condom use was reported among university students.

In the Islamic Republic of Iran, 12.4% of young males reported premarital or extramarital sex in one study, 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. Condom nonuse was associated with poor access to the Internet (reflecting poorer knowledge), feeling regretful at first sex, and one lifetime sexual partner. Meanwhile, multiple sexual partnerships were associated with alcohol consumption, older ages, and poor knowledge of reproductive physiology. Close to half of the adolescents in this sample were unfamiliar with condoms and their protective effect against STIs, including HIV. Eight percent of college students reported that 20% of the respondents had a history of sexual contact.

In Somalia, 7% of youth acknowledged sexual activity in the last year. Almost half (48.6%) of sexually active youth, 0.6% reported condom use, 2% reported used a condom during the most recent sexual activity. About 23% of women under age 24 had knowledge of condoms.

In Sudan, 6.9% of university students reported having sex and 5.5% engaged in premarital sex. 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. In another study of university students, 6.2% reported ever using a condom, and 14.4% reported extramarital sex. In a study of youth, 0.6% reported condom use, 2% reported

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. 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. 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. About 10% of the youth reported nonmarital sexual contacts in the last year.

In Lebanon, behavioral surveys suggest increased risky behavior among youth. About 50% of young conscripts reported any lifetime heterosexual experience and about 50% reported consistent condom use. In Mauritania, 40% of male school students reported sexual activity, with 41% of them reporting multiple sexual partnerships and 38% reporting unprotected sexual intercourse. In Pakistan, 80% of young men masturbated and 94% had experienced nocturnal emissions.

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. About 23% of women under age 24 had knowledge of condoms.

In Sudan, 6.9% of university students reported having sex and 5.5% engaged in premarital sex. About 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. In another study of university students, 6.2% reported ever using a condom, and 14.4% reported extramarital sex. In a study of youth, 0.6% reported condom use, 2% reported

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.”
211 Mohammad et al., “Sexual Risk-Taking Behaviors.”
212 Ibid.
213 Mohammad 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.”
218 Johns Hopkins University, “Youth Survey.”
219 Jenkins and Robalino, “HIV in the Middle East and North Africa.”
222 Adib et al., “Heterosexual Awareness and Practices.”
223 Nidiaye et al., “Evaluation of Condom Use.”
224 Oidwai, “Sexual Knowledge.”
225 WHO/EMRO, “Presentation of WHO Somalia’s Experience.”
226 Population Studies Research Institute, “Baseline Survey.”
228 Ibid.
229 Ahmed, University Students.
found to embrace Western values, associated with liberal attitudes toward sexuality, rather than traditional values, and appear to have relaxed attitudes toward sexuality.

Youth in MENA do not seem to be concerned about HIV infection. Only 14.2% in Iran and 20% in Djibouti 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. There are no satisfactory data that clarify the engagement of youth in nonconventional forms of marriage, but there is evidence of significantly higher approval of such marriage forms among youth compared to older age groups. More than a quarter of Iranian youth approve of temporary marriages.

Reproductive knowledge among youth, specifically in the Islamic Republic of Iran, has been associated with lower sexual risk behavior and increased condom use, just as in other regions. 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. 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.

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 to condom use with commercial sex workers (CSWs), and 9.5% reported nonregular partners in the last year.

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. In another study, 61.2% of males and 18.3% of females reported sexual intercourse among final-year university students aged 20–25 years. 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. In a fourth study, 46% of male adolescents and 3% of female adolescents had sexual intercourse. The median age at first intercourse was 17 years for males and 16 years for females. Among those who had intercourse, 44% of the males and 67% of the females had their first experience with their lovers. 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. 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.

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. Youth emigration is prevalent in MENA, and in Lebanon, a third of the population emigrated for at least some time during the civil war. Students in Lebanon are increasingly

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230 Sudan National AIDS Control Program, Situation Analysis.
231 Ungan and Yaman, “AIDS Knowledge and Educational Needs.”
232 Aras et al., “Sexual Behaviours and Contraception.”
233 Gokcen 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.
may include nonpenetrative sexual activities, which are less of a concern in relation to HIV. Though 28% of males aged 15–18 years reported sexual experiences in the Islamic Republic of Iran, 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. 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. Increases in sexual risk behavior have been observed in other regions, such as Latin America and Asia, due to the changes in the socioeconomic conditions.

Anecdotal observations suggest that risky behaviors and sexual activity are increasing among both male and female youth in MENA. These observations are supported by a trend of increasing HIV incidence in the younger age groups. 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. 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. 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.

In Kuwait, STI incidence has been steadily increasing, and there appears to be an increase in precancerous cervical lesions in women, with appearance of these lesions at a younger age. In Lebanon, a similar trend of increases in precancerous lesions has been reported over the years from 2002 to 2006, also at younger ages. Also in Lebanon, repeated behavioral surveys have indicated increased risky behavior among youth. In Saudi Arabia, the percentage of abnormal Pap smears appears to be increasing. In Turkey, the share of high school students who reported having sexual experiences increased from 11.3% in 1997 to 22.8% in 2004. 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, and tenfold in another study between 1998 and 2007.

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.”
255 Mohammad et al., “Reproductive Knowledge, Attitudes and Behavior.”
256 Pisani et al., “HIV Surveillance.”
258 Busulwa, “HIV/AIDS Situation Analysis Study.”
260 World Bank, “Mapping and Situation Assessment.”
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.”
266 Kosar et al., “Cervical Cancer Screening.”
267 Yamazhan et al., “Attitudes towards HIV/AIDS.”
269 Coskun et al., “Prevalence of HIV and Syphilis.”
270 Iran Center for Disease Management, Three Month Statistics of the MoH AIDS Office.

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. 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. Displacement, migration, and high urban poverty provide fertile grounds for the establishment of sex work. The loneliness and anonymity associated with living in a foreign country can be conducive to practicing high-risk behavior.

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. 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. The presence of the African Peace Keepers in Darfur has added another risk factor for HIV infection, particularly among women.

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.

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 with the Persian Gulf region hosting the largest share of guest workers to indigenous populations anywhere. The International Organization for Migration (IOM) estimates that there are 14 million international migrants in the Arab Middle East. 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. Three MENA countries, Egypt, Lebanon, and Jordan, are among the nine largest recipients of remittances from migrant workers among developing countries.

Migration has enormously affected demographics in MENA. It is estimated that a million Afghans leave Afghanistan every year to work abroad. Seasonal economic migration also appears to be high in Afghanistan. The migrant workforce accounted for 4.7% of the total population in the Republic of Yemen in 1994. There are 875,000 Yemenis registered as living abroad. It is estimated that there are 2 million economic migrants and 16 million pastoralists in the Horn of Africa region. Migration and being away from family are associated with higher exposure to STIs.

Structural factors related to migration

There are structural problems in MENA that drive the high levels of migration. The Arab

272 Ibid.
274 Al-Mutairi et al., “Clinical Patterns.”
275 Salama and Dondoro, “HIV Surveillance in Complex Emergencies.”
276 World Bank, “Mapping and Situation Assessment.”
277 Basra, “Vulnerable Population Research in Darfur.”
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.”
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%, three times the global average. 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. 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.

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. 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.

Domestic workers in MENA are vulnerable to marginalization, gender-based discrimination, and exploitation and some are experiencing sexual abuse or are being forced into sex work. 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. Trafficking in persons is another aspect of migration in MENA.

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. The growth of the Qualifying Industrial Zones in Jordan has also created more demand for migrant workers.

The rural-urban and urban-urban migrations are also structural challenges in MENA. 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, 91.7% of military personnel, 76.9% of prisoners, 78.2% of truck drivers, 58.4% of tea sellers, 66.5% of street children, 51.4% of ANC attendees, 62.6% of FSWs, 56.3% of TB patients, 55.9% of STD clinic attendees, and 78.3% of suspected AIDS patients. 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. Among FSWs in the Red Sea State in Sudan, 59% were migrants from outside of this state; and among FSWs in Khartoum State, only about one-quarter were born in this state. In Pakistan, 40%–70% of different priority populations reported having emigrated.

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291 Fergany, Aspects of Labor Migration.
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.
from other cities. In the Islamic Republic of Iran, 14.5% of the population had migrated within the country. 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. These workers are vulnerable to practices that increase the risk of exposure to HIV. 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. 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, 76% in the United Arab Emirates, and 62% in Kuwait. 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.

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. In the Maghreb region of MENA, the dominant pattern of migration is to Western Europe. The Maghreb region is also increasingly used as a transit route toward Europe, or as a destination of sub-Saharan African migrants.

### 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, and 66% reported starting drug use while living in the Islamic Republic of Iran. Among married STD clinic attendees in Kuwait, 70% were living alone and the average number of sexual partners was 2.3.

Over 55% of single migrant men in Pakistan reported sexual experiences and 36% of married migrant men reported premarital sex. 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. Among Pakistani workers in the Middle East, there is evidence of high-risk behaviors such as contacts with sex workers.

Women from the former Soviet Union represent the majority of FSWs in the United Arab Emirates. 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. 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. Most often the testing happens without counseling or informed consent. 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.

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, 0.05% in Qatar, 0.1% to 0.2% in Saudi Arabia, and...
0.06% in the United Arab Emirates. 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, Egypt, Indonesia, Lebanon, the Philippines, Sri Lanka, Sudan, and the Republic of Yemen. Most exposures to STDs among migrant STD clinic attendees in Kuwait (92%) occurred in Kuwait.  

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. Among the newly identified infections in 2004, 56% were among returning migrants. 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. These workers represented 61% to 86% of reported cases every year in Pakistan during the 1996–98 period. In the Philippines, 34% of PLHIV were overseas Filipino workers and 17% of them were domestic workers, while only 8% were entertainers. 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.  

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.  

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. This includes 15.2 million refugees, 827,000 asylum seekers, and 26 million IDPs. 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). Afghan and Iraqi refugees account for almost half of all refugees under the United Nations High Commissioner for Refugees (UNHCR) responsibility worldwide. 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).  

MENA continues to have high numbers of internally displaced persons in Afghanistan, Iraq, Somalia, and Sudan. There are 2.6 million IDPs in Iraq. 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. Sudan is ranked among the leading countries in the world in terms of the number of IDPs. There are about 4 million IDPs living in Khartoum and other states. During the civil war in Lebanon, almost a third of the population was displaced.
**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 women in non-IDP camps.\(^{386}\)

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\(^{371}\) 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.”
women in the general population.\textsuperscript{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.\textsuperscript{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\%).\textsuperscript{388}

No evidence has been found in MENA to support the claim that refugees spread HIV infection in host communities.\textsuperscript{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\%.\textsuperscript{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 Kenya\textsuperscript{391}; 5\% for men and 2\% for women in Ethiopia\textsuperscript{392}; and 1\% and 2.7\% in Uganda.\textsuperscript{393} In several studies in Sudan, HIV prevalence among IDPs or refugees was 1.57\%,\textsuperscript{394} 1\%,\textsuperscript{395} 4\%,\textsuperscript{396} 1\%,\textsuperscript{397} 0.26\%,\textsuperscript{398} and 0.27\%.\textsuperscript{399} Among Somali refugees attending ANCs in Kenya, HIV prevalence was 0.7\% in 2003,\textsuperscript{400} 1.4\% in 2005,\textsuperscript{401} and 1\% in 2006.\textsuperscript{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.\textsuperscript{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.\textsuperscript{404} Causes of this phenomenon in MENA include poverty, family disruption, natural and manmade disasters, following friends, and desiring drugs.\textsuperscript{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.\textsuperscript{406} Boys often engage in odd jobs, begging, theft, and sex work.\textsuperscript{407} Girls, who have fewer work opportunities, obtain money primarily through begging and sex work.\textsuperscript{408} Street girls in Sudan reported being frequently raped by street boys.
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...
Characterizing the HIV/AIDS Epidemic in the Middle East and North Africa

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

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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.”

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.

**BIBLIOGRAPHY**


Medical Microbiology, University of Gothenburg, Gothenburg.


Characterizing the HIV/AIDS Epidemic in the Middle East and North Africa


Characterizing the HIV/AIDS Epidemic in the Middle East and North Africa


Ministry of Health and Medical Education of Iran. 2006. “Treatment and Medical Education.” Islamic Republic of Iran HIV/AIDS Situation and Response Analysis.


Zamani, S. 2008. “Methadone Maintenance Treatment (MMT) for Drug-Using Prisoners in Ghezel Hesar Prison, Karaj, Iran: A Qualitative Study.” UNAIDS Collaborating Centre on Socio-Epidemiological HIV Research, Kyoto University, Japan.


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. 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. 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. The validity of reported risk behaviors from people whose risk behaviors are illegal, such as those of priority groups, is open to question.

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. 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

\[\text{References}\]

1. Obasi et al., "Antibody to Herpes Simplex Virus Type 2."
3. Catania et al., "Methodological Problems."
4. Pisani et al., "HIV Surveillance."
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, and is the leading cause of genital ulcer disease (GUD) in both developed and developing countries. 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. Genital herpes is almost exclusively transmitted sexually and induces the production of lifelong antibodies.

The strong observed correlations between HSV-2 infection and sexual risk behavior suggested the use of HSV-2 antibodies in the blood as a convenient and objective serological marker of sexual behavior in different populations. 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, and that it had played a leading role in fueling the HIV epidemic in different populations. The vast majority of HIV-positive people are also infected with HSV-2, and HSV-2 is most often acquired before HIV.

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.

**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. The pattern in table 10.1 is that of low or very low HSV-2 prevalence among general population 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. In the Islamic Republic of Iran, a 28% prevalence was reported among a randomly selected population of women attending nine primary health care centers. In Jordan, a prevalence of 53% for males and 42% for females was reported among

---


8 van de Laar et al., “Prevalence and Correlates of Herpes.”

9 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.”

10 Nahmias, Lee, and Beckman-Nahmias, “Sero-Epidemiological and Sociological Patterns.”

11 Freeman et al., “Herpes Simplex Virus 2 Infection.”

12 Abu-Raddad et al., “Genital Herpes”; Corey et al., “The Effects of Herpes.”

13 Corey et al., “The Effects of Herpes.”

14 Nagelkerke et al., “Body Mass Index.”


16 El-Sayed, Zaki, and Goda, “Relevance of Parvovirus B19.”

17 Kasraeian, Movaeahghi, and Ghiam, “Seroepidemiological Study.”
Table 10.1 HSV-2 Prevalence in Different Population Groups

<table>
<thead>
<tr>
<th>Country</th>
<th>HSV-2 prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arab Israelis</td>
<td>9.0% (Arab and Jewish non-Soviet immigrants; pregnant women; Dan et al. 2003) 2.4% (Arabs; STD clinic attendees; Feldman et al. 2003)</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>12.0% (women attending basic health care clinic; Bogaerts et al. 2001)</td>
</tr>
<tr>
<td>Djibouti</td>
<td>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)</td>
</tr>
<tr>
<td>Egypt, Arab Republic of</td>
<td>6.2% (STD clinic attendees; Saleh et al. 2000)</td>
</tr>
<tr>
<td>Iran, Islamic Republic of</td>
<td>8.25% (pregnant women; Ziyaeyan et al. 2007)</td>
</tr>
<tr>
<td>Lebanon</td>
<td>0.027% (general population women; Karam et al. 2007)</td>
</tr>
<tr>
<td>Morocco</td>
<td>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)</td>
</tr>
<tr>
<td>Pakistan</td>
<td>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; banthas; Hawkes et al. 2009) 2.5% (MSWs; banthas; Hawkes et al. 2009) 14.0% (MSWs; khotkis; Hawkes et al. 2009) 25.0% (MSWs; khotkis; Hawkes et al. 2009) 54.0% (MSWs; khusras; Hawkes et al. 2009) 31.3% (MSWs; khusras; Hawkes et al. 2009)</td>
</tr>
<tr>
<td>Sudan</td>
<td>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)</td>
</tr>
<tr>
<td>Syrian Arab Republic</td>
<td>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)</td>
</tr>
<tr>
<td>Turkey</td>
<td>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)</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>12.0% (migrant workers; N. J. Nagelkerke, personal communication [2007])</td>
</tr>
</tbody>
</table>
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. The prevalence grows rather slowly for both males and females compared to other regions, 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. 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). 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. This suggests the potential for HIV to spread among priority populations.
Table 10.2 HSV-2 Prevalence in the General Population in Different Regions of the World Compared to MENA

<table>
<thead>
<tr>
<th>Region</th>
<th>HSV-2 prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia</td>
<td>10% to 30%</td>
</tr>
<tr>
<td>Europe</td>
<td>4% to 24%</td>
</tr>
<tr>
<td>Latin America</td>
<td>20% to 40%</td>
</tr>
<tr>
<td>Middle East and North Africa</td>
<td>0% to 15%</td>
</tr>
<tr>
<td>North America</td>
<td>18% to 26%</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>10% to 80%</td>
</tr>
</tbody>
</table>


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. 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. Population-based data of HSV-2 collected sequentially in time would be valuable to determine the trends of sexual risk behavior. 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. 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.

In terms of limitations, HSV-1 infection has near universal prevalence in MENA and may have a protective effect against HSV-2 acquisition, thereby partially contributing to the low prevalence of HSV-2 in MENA. However, the evidence for a protective effect is conflicting, and despite high HSV-1 prevalence in most populations around the globe, 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. 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.

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

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.”
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.”
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.”
by Western blot assays (WBA), which provide the golden reference standard for measuring HSV-2 serology.\textsuperscript{43} This validation appears to have been done only once in MENA on a Moroccan sample using centralized study protocols and laboratory testing.\textsuperscript{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.\textsuperscript{35} It is the leading cause of over 99% of all cervical cancer cases worldwide.\textsuperscript{46} HPV is also the causative agent of anogenital warts, which cause substantial health care costs globally,\textsuperscript{47} and HPV is a major cause of the cancers of the vagina, vulva, and penis.\textsuperscript{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.\textsuperscript{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.\textsuperscript{50} Numerous studies have demonstrated the association between the number of lifetime sex partners and genital HPV infection,\textsuperscript{51} including studies in MENA.\textsuperscript{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.\textsuperscript{53} HPV infection is not only associated with sexual intercourse, but also with other sexual contacts such as penile-vulvar, oral-genital, or finger-vulvar contacts.\textsuperscript{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.\textsuperscript{55}

**Cervical cancer levels**

A number of studies and international databases\textsuperscript{56} have documented cervical cancer levels in MENA. Table 10.3 shows the rates of cervical cancer incidence for each of the MENA countries.\textsuperscript{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.\textsuperscript{58} Figure 10.2 depicts the age-stratified cervical cancer

\textsuperscript{43} Ashley and Wald, “Genital Herpes.”
\textsuperscript{44} Patnaik et al., “Type-Specific Seroprevalence.”
\textsuperscript{45} Burchell et al., “Modeling the Sexual Transmissibility.”
\textsuperscript{46} Bosch et al., “Prevalence of Human Papillomavirus in Cervical Cancer”; Walboomers et al., “Human Papillomavirus.”
\textsuperscript{47} Lacey, Lewndes, and Shah, “Chapter 4.”
\textsuperscript{48} Munoz et al., “Chapter 1.”
\textsuperscript{49} Trottier and Franco, “The Epidemiology of Genital Human Papillomavirus Infection.”
\textsuperscript{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.”
\textsuperscript{51} Baseman and Koutsky, “The Epidemiology of Human Papillomavirus Infections”; Lu et al., “Factors Associated with Acquisition and Clearance.”
\textsuperscript{53} Trottier and Franco, “The Epidemiology of Genital Human Papillomavirus Infection”; Chuang et al., “Condyloma Acuminatum.”
\textsuperscript{54} Burchell et al., “Chapter 8.”
\textsuperscript{55} Skegg et al., “Importance of the Male Factor.”
\textsuperscript{57} Ferlay et al., “GLOBOCAN 2002.”
\textsuperscript{58} Curado et al., Cancer Incidence in Five Continents, Volume IX.
incidence in select MENA populations compared to the global average.\textsuperscript{59}

Globally, the incidence of cervical cancer per country varies widely with rates ranging from 3 to 61 per 100,000 women per year.\textsuperscript{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.\textsuperscript{61} The Middle Eastern region has the lowest cervical cancer incidence rate of all regions at 5.6 per 100,000 women per year.\textsuperscript{62} Of the distribution by predominant religion, Muslim states have the lowest cervical cancer rates at 15.6 per 100,000 women per year.\textsuperscript{63} The lowest recorded incidence rate of cervical cancer worldwide is 0.4 per 100,000 women per year in Ardabil, Islamic Republic of Iran.\textsuperscript{64} Data from MENA also show a generally low prevalence of cervical intraepithelial neoplasia, the precursor to cervical cancer.\textsuperscript{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,\textsuperscript{66} just as it is the most common cancer in developing countries.\textsuperscript{67} It is the second

\textsuperscript{59} Parkin et al., Cancer Incidence in Five Continents, Vol. VIII.
\textsuperscript{60} Drain et al., “Determinants of Cervical Cancer Rates.”
\textsuperscript{61} Ibid.
\textsuperscript{62} Ibid.
\textsuperscript{63} Ibid.
\textsuperscript{64} Sadjadi et al., “Cancer Occurrence in Ardabil.”
\textsuperscript{66} Elattar, “Cancer in the Arab World.”
\textsuperscript{67} WHO, “Human Papillomavirus and HPV Vaccination.”

### Table 10.3 Age-Standardized Rates of Cervical Cancer Incidence and Mortality (per 100,000 women per year)

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Incidence ASR</th>
<th>Mortality ASR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>6.9</td>
<td>3.6</td>
</tr>
<tr>
<td>Algeria</td>
<td>15.6</td>
<td>12.7</td>
</tr>
<tr>
<td>Bahrain</td>
<td>8.5</td>
<td>4.8</td>
</tr>
<tr>
<td>Djibouti</td>
<td>42.7</td>
<td>34.6</td>
</tr>
<tr>
<td>Egypt, Arab Rep. of</td>
<td>9.7</td>
<td>7.9</td>
</tr>
<tr>
<td>Iraq</td>
<td>3.3</td>
<td>1.8</td>
</tr>
<tr>
<td>Iran, Islamic Republic of</td>
<td>4.4</td>
<td>2.4</td>
</tr>
<tr>
<td>Israel</td>
<td>4.6</td>
<td>2.3</td>
</tr>
<tr>
<td>Jordan</td>
<td>4.3</td>
<td>2.4</td>
</tr>
<tr>
<td>Kuwait</td>
<td>6.1</td>
<td>3.4</td>
</tr>
<tr>
<td>Lebanon</td>
<td>15.4</td>
<td>8.0</td>
</tr>
<tr>
<td>Libya</td>
<td>11.9</td>
<td>9.6</td>
</tr>
<tr>
<td>Morocco</td>
<td>13.2</td>
<td>10.7</td>
</tr>
<tr>
<td>Oman</td>
<td>6.9</td>
<td>3.9</td>
</tr>
<tr>
<td>Pakistan</td>
<td>6.5</td>
<td>3.6</td>
</tr>
<tr>
<td>Qatar</td>
<td>3.9</td>
<td>2.2</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>4.6</td>
<td>2.5</td>
</tr>
<tr>
<td>Somalia</td>
<td>42.7</td>
<td>34.6</td>
</tr>
<tr>
<td>Sudan</td>
<td>15.4</td>
<td>12.7</td>
</tr>
<tr>
<td>Syrian Arab Republic</td>
<td>2.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Tunisia</td>
<td>6.8</td>
<td>5.5</td>
</tr>
<tr>
<td>Turkey</td>
<td>4.5</td>
<td>2.4</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>9.9</td>
<td>5.3</td>
</tr>
<tr>
<td>Yemen, Republic of</td>
<td>8.0</td>
<td>4.6</td>
</tr>
</tbody>
</table>

Note: ASR = age-standardized rates.

### 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)

<table>
<thead>
<tr>
<th>Country</th>
<th>ASR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria</td>
<td>11.6</td>
</tr>
<tr>
<td>Setif</td>
<td></td>
</tr>
<tr>
<td>Egypt, Arab Rep. of</td>
<td></td>
</tr>
<tr>
<td>Gharbiah</td>
<td>2.1</td>
</tr>
<tr>
<td>Tunis</td>
<td>7.1</td>
</tr>
<tr>
<td>Centre, Sousse</td>
<td></td>
</tr>
<tr>
<td>Bahrain</td>
<td>6</td>
</tr>
<tr>
<td>Bahraini</td>
<td></td>
</tr>
<tr>
<td>Israel</td>
<td></td>
</tr>
<tr>
<td>Non-Jews</td>
<td>2.4</td>
</tr>
<tr>
<td>Kuwait</td>
<td></td>
</tr>
<tr>
<td>Kuwaitis</td>
<td>4.5</td>
</tr>
<tr>
<td>Non-Kuwaitis</td>
<td>5.3</td>
</tr>
<tr>
<td>Malaysia</td>
<td></td>
</tr>
<tr>
<td>Penang</td>
<td>17.9</td>
</tr>
<tr>
<td>Sarawak</td>
<td>15.9</td>
</tr>
<tr>
<td>Oman</td>
<td></td>
</tr>
<tr>
<td>Omani</td>
<td>6.5</td>
</tr>
<tr>
<td>Pakistan</td>
<td></td>
</tr>
<tr>
<td>South Karachi</td>
<td>7.5</td>
</tr>
<tr>
<td>Singapore</td>
<td></td>
</tr>
<tr>
<td>Malay</td>
<td>7.3</td>
</tr>
<tr>
<td>Turkey</td>
<td></td>
</tr>
<tr>
<td>Antalya</td>
<td>4.4</td>
</tr>
<tr>
<td>Izmir</td>
<td>5.4</td>
</tr>
</tbody>
</table>

Source: Curado et al. 2007.
Note: Rates derived using robust methodology; ASR = age-standardized rates.
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, 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

Figure 10.2 Age-Stratified Cervical Cancer Incidence in Select MENA Populations Compared to the Global Average

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

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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.”
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. A leading cause of this could be contacts with sex workers and the role of commercial sex in linking individuals within sexual networks. Since HPV is very infectious and its transmission probability may be as high as 40% per coital act, 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. The mean age of women with cervical cancer in MENA, as well as globally, is around 50 years. 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.

Table 10.5 HPV Prevalence in Different Population Groups in MENA

<table>
<thead>
<tr>
<th>Country</th>
<th>HPV prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria</td>
<td>12.4% (controls in a hospital-based, case control study; Hammouda et al. 2005)</td>
</tr>
<tr>
<td>Bahrain</td>
<td>11.0% (women attending health facilities; Hajjaj et al. 2006)</td>
</tr>
<tr>
<td>Egypt, Arab Republic of</td>
<td>3.0% (community-based household survey; El-All, Refaat, and Dandash 2007)</td>
</tr>
<tr>
<td></td>
<td>15.0% (general population women; Abdel Aziz et al. 2006)</td>
</tr>
<tr>
<td>Iran, Islamic Republic of</td>
<td>13.0% (gynecology clinic attendees; Ghaffari et al. 2006)</td>
</tr>
<tr>
<td></td>
<td>9.0% (general population women; Hankar et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>3.0% (general population women; Farhadi 2005)</td>
</tr>
<tr>
<td>Jordan</td>
<td>0.0% (hospital attendees; Malkawi et al. 2004)</td>
</tr>
<tr>
<td>Lebanon</td>
<td>4.9% (gynecological clinic attendees; Mroueh et al. 2002)</td>
</tr>
<tr>
<td>Morocco</td>
<td>21.0% (controls in a hospital-based case control study; Chaouki et al. 1998)</td>
</tr>
<tr>
<td>Pakistan</td>
<td>33.0% (unspecified cervical specimens; Anwar et al. 1991)</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>32.0% (family medical clinic attendees; Al-Muammar et al. 2007)</td>
</tr>
<tr>
<td>Tunisia</td>
<td>14.0% (national family population office attendees; Hassen, Remadi, and Chouchane 1999)</td>
</tr>
<tr>
<td>Turkey</td>
<td>8.0% (adolescent pregnant women; Yildirim, Inal, and Tinar 2005)</td>
</tr>
<tr>
<td></td>
<td>6.0% (low-risk hospital attendees; Ozelik et al. 2003)</td>
</tr>
<tr>
<td></td>
<td>2.0% (general population women; Inal et al. 2007)</td>
</tr>
<tr>
<td></td>
<td>2.0% (controls in a clinic-based case control study; Cirpan et al. 2007)</td>
</tr>
<tr>
<td>West Bank and Gaza</td>
<td>13.0% (pregnant women; Lubbad and Al-Hindi 2007)</td>
</tr>
</tbody>
</table>

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.”
86 Burchell et al., “Chapter 6.”
Figure 10.3 A Schematic Diagram of Two Different Kinds of Sexual Networks with Different Connectivity

(a) Female sex workers Females Males (b) Female sex workers

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. A similar apparent trend has been reported among women in Lebanon, particularly at younger ages. The percentage of abnormal Pap smears also appears to be increasing in Saudi Arabia. This may suggest an increase in 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 HPV and genital warts and improve clearance of HPV infection among men, 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. Pap smear screening appears to be at low levels, such as at 2% in Egypt and 2.6% in Pakistan. Cervical cancer diagnosis appears to occur in advanced stages where it is associated with a high mortality rate. 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.

References:

87 Kapila et al., “Changing Spectrum of Squamous Cell Abnormalities.”
88 Karam et al., “Prevalence of Sexually Transmitted Infections.”
89 Altaf, “Cervical Cancer Screening.”
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-All, Refaat, and Dandash, “Prevalence of Cervical Neoplastic Lesions.”
95 Imam et al., “Perceptions and Practices.”
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. Due to the intrusive nature of the test, in conservative societies many women prefer for such a test to be administered by females. In Kuwait, 78.7% of women in one study preferred that a female doctor conduct the test. 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. In a study in the Islamic Republic of Iran, 68.5% of women reported having undergone at least one Pap test. 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. 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.

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. The available vaccines protect against the dominant types that cause cervical cancer in MENA (mainly types 16 and 18). It also appears that there is a positive attitude toward HPV vaccination in at least a few Muslim societies.

Vaccination can reduce the need for Pap smear screening by reducing the age of initiation of screening or its frequency. 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%. Combining vaccination with three screening events per lifetime can reduce the incidence by 61%. 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

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**Figure 10.4 The Natural History of HPV Infection and Cervical Cancer**

![Figure showing the natural history of HPV infection and cervical cancer](Image)

Source: Schiffman and Castle 2005.

Note: Reproduced with permission. Copyright © 2005 Massachusetts Medical Society. All rights reserved.
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. 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. 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. 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.

**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. Prevalence levels outside of priority populations are generally low, and possibly reflect exposures among sexual partners of priority or bridging populations.

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

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111 Ginsberg et al., “Cost-Utility Analysis.”
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

<table>
<thead>
<tr>
<th>Country</th>
<th>Syphilis prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Afghanistan</strong></td>
<td></td>
</tr>
<tr>
<td>Afghanistan</td>
<td>0.0% (ANC attendees; Todd et al. 2007; Todd et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>1.1% (blood donors; Afghanistan Central Blood Bank 2008)</td>
</tr>
<tr>
<td></td>
<td>2.2% (IDUs; Todd et al. 2007)</td>
</tr>
<tr>
<td>Algeria</td>
<td>0.8% (pregnant women; Alami 2009)</td>
</tr>
<tr>
<td></td>
<td>0.8% (pregnant women; Alami 2009)</td>
</tr>
<tr>
<td></td>
<td>0.53% (pregnant women; Aidaoui, Bouzbid, and Laouar 2008)</td>
</tr>
<tr>
<td></td>
<td>3.62% (ANC attendees; Unknown, Statut de la réponse nationale)</td>
</tr>
<tr>
<td></td>
<td>2.3% (STI clinic attendees; Alami 2009)</td>
</tr>
<tr>
<td></td>
<td>5.8% (STI clinic attendees; Alami 2009)</td>
</tr>
<tr>
<td></td>
<td>11.9% (FSWs; Alami 2009)</td>
</tr>
<tr>
<td></td>
<td>8.4% (FSWs; Alami 2009)</td>
</tr>
<tr>
<td>Djibouti</td>
<td>0.0% (high school students; Rowe 2007)</td>
</tr>
<tr>
<td></td>
<td>3.1% (pregnant women; WHO and EMRO 1998)</td>
</tr>
<tr>
<td></td>
<td>4.0% (ANC attendees; Unknown 2002)</td>
</tr>
<tr>
<td></td>
<td>0.4% (blood donors; Massenet and Bouh 1997)</td>
</tr>
<tr>
<td></td>
<td>41.0% (FSWs; Rowe 2007)</td>
</tr>
<tr>
<td></td>
<td>46.0% (FSWs; Rodier et al. 1993; Rowe 2007)</td>
</tr>
<tr>
<td>Egypt, Arab Republic of</td>
<td>0.05% (university students; El-Gilany and El-Fedawy 2006)</td>
</tr>
<tr>
<td></td>
<td>0.0% (family planning attendees; El-Sayed et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>0.0% (ANC attendees; El-Sayed et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>0.3% (tourism workers; El-Sayed et al. 1996)</td>
</tr>
<tr>
<td></td>
<td>1.0% (STD clinic attendees; El-Sayed et al. 1996)</td>
</tr>
<tr>
<td></td>
<td>1.0% (active syphilis; STD clinic attendees; El-Sayed et al. 1996)</td>
</tr>
<tr>
<td></td>
<td>1.3% (IDUs; El-Sayed et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>5.8% (FSWs; El-Sayed et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>7.5% (MSM; El-Sayed et al. 2002)</td>
</tr>
<tr>
<td>Iran, Islamic Republic of</td>
<td>0.0% (street children; Vahdani et al. 2006)</td>
</tr>
<tr>
<td></td>
<td>0.1% (general population; Dezfulimanesh and Tehranian 2005)</td>
</tr>
<tr>
<td></td>
<td>0.0% (runaways and other women seeking safe haven; Hajiabdolbaghi et al. 2007)</td>
</tr>
<tr>
<td></td>
<td>0.0% (blood donors; Khedmat et al. 2007)</td>
</tr>
<tr>
<td>Jordan</td>
<td>0.0% (symptomatic hospital attendees; Jordan Ministry of Health 2004)</td>
</tr>
<tr>
<td></td>
<td>0.0% (asymptomatic hospital attendees; Jordan Ministry of Health 2004)</td>
</tr>
<tr>
<td></td>
<td>0.0% (symptomatic hospital attendees; As’ad 2004)</td>
</tr>
<tr>
<td></td>
<td>0.0% (asymptomatic hospital attendees; As’ad 2004)</td>
</tr>
<tr>
<td></td>
<td>0.0% (symptomatic hospital attendees; Mahafzah et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>0.0% (asymptomatic hospital attendees; Mahafzah et al. 2008)</td>
</tr>
<tr>
<td>Kuwait</td>
<td>0.0% (STD clinic attendees; Al-Muta’ari et al. 2007)</td>
</tr>
<tr>
<td>Lebanon</td>
<td>0.0% (rural population; Deeb et al. 2003)</td>
</tr>
<tr>
<td>Morocco</td>
<td>3.4% (family planning center attendees; Ryan et al. 1998)</td>
</tr>
<tr>
<td></td>
<td>5.6% (symptomatic primary health care center attendees; Ryan et al. 1998)</td>
</tr>
<tr>
<td></td>
<td>2.8% (ANC attendees; WHO/EMRO Regional Database on HIV/AIDS)</td>
</tr>
<tr>
<td></td>
<td>3.0% (pregnant women; WHO/EMRO 1998)</td>
</tr>
<tr>
<td></td>
<td>1.0% (pregnant women; Khattabi and Alami 2005)</td>
</tr>
<tr>
<td></td>
<td>0.73% (pregnant women; Bennani and Alami 2006)</td>
</tr>
<tr>
<td></td>
<td>2.8% (general population; WHO/EMRO Regional Database on HIV/AIDS)</td>
</tr>
<tr>
<td></td>
<td>1.3% (blood donors; WHO/EMRO 1998)</td>
</tr>
<tr>
<td></td>
<td>0.4% (hotel staff; Khattabi and Alami 2005)</td>
</tr>
<tr>
<td></td>
<td>0.94% (hotel staff; Bennani and Alami 2006)</td>
</tr>
<tr>
<td></td>
<td>2.9% (seasonal female laborers; Khattabi and Alami 2005)</td>
</tr>
<tr>
<td></td>
<td>2.17% (seasonal female laborers; Bennani and Alami 2006)</td>
</tr>
<tr>
<td></td>
<td>0.0% (male laborers; Khattabi and Alami 2005)</td>
</tr>
<tr>
<td></td>
<td>4.51% (male laborers; Bennani and Alami 2006)</td>
</tr>
<tr>
<td></td>
<td>9.55% (truck drivers; Khattabi and Alami 2005)</td>
</tr>
</tbody>
</table>

*(continued)*
### Table 10.6 (Continued)

<table>
<thead>
<tr>
<th>Country</th>
<th>Syphilis prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Pakistan</td>
<td>0.4% (ANC attendees; WHO/EMRO 2007)</td>
</tr>
<tr>
<td></td>
<td>0.4% (general population; WHO/EMRO Regional Database on HIV/AIDS)</td>
</tr>
<tr>
<td></td>
<td>0.19%–0.57% (blood donors; Sultan, Mehmood, and Mahmood 2007)</td>
</tr>
<tr>
<td></td>
<td>9.4% (truck drivers; WHO/EMRO 2007)</td>
</tr>
<tr>
<td></td>
<td>1%–4% (truck drivers; Pakistan National AIDS Control Program 2005a)</td>
</tr>
<tr>
<td></td>
<td>7.0% (persons arrested for drug-related crimes; Baqi 1996)</td>
</tr>
<tr>
<td></td>
<td>4%–18% (IDUs; Pakistan National AIDS Control Program 2005a)</td>
</tr>
<tr>
<td></td>
<td>11.0% (IDUs; WHO/EMRO Regional Database on HIV/AIDS)</td>
</tr>
<tr>
<td></td>
<td>7.6% (IDUs; Platt et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>3.9% (IDUs; Platt et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>23.5% (FSWs; WHO/EMRO 2007)</td>
</tr>
<tr>
<td></td>
<td>4–7% (FSWs; Pakistan National AIDS Control Program 2005a)</td>
</tr>
<tr>
<td></td>
<td>1.2% (FSWs; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>2.8% (FSWs; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>6–36% (MSWs; Pakistan National AIDS Control Program 2005a)</td>
</tr>
<tr>
<td></td>
<td>21% (MSWs; WHO/EMRO Regional Database on HIV/AIDS)</td>
</tr>
<tr>
<td></td>
<td>11%–60% (hijras; Pakistan National AIDS Control Program 2005a)</td>
</tr>
<tr>
<td></td>
<td>50.0% (hijras; Khan et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>36.0% (hijras; WHO/EMRO Regional Database on HIV/AIDS)</td>
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<tr>
<td></td>
<td>4.7% (MSWs; banthas; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>4.9% (MSWs; banthas; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>9.6% (MSWs; khotkis; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>0.0% (MSWs; khotkis; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>48.8% (MSWs; khusras; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>37.5% (MSWs; khusras; Hawkes et al. 2009)</td>
</tr>
<tr>
<td>Qatar</td>
<td>1.1% (blood donors; WHO/EMRO 1998)</td>
</tr>
<tr>
<td>Somalia</td>
<td>2.0% (ANC attendees; Somaliland Ministry of Health and Labour 2007)</td>
</tr>
<tr>
<td></td>
<td>1.4% (ANC attendees; Somaliland Ministry of Health and Labour 2007)</td>
</tr>
<tr>
<td></td>
<td>3.6% (ANC attendees; Somaliland Ministry of Health and Labour 2007)</td>
</tr>
<tr>
<td></td>
<td>0.0% (ANC attendees; Somaliland Ministry of Health and Labour 2007)</td>
</tr>
<tr>
<td></td>
<td>2.4% (ANC attendees; Somaliland Ministry of Health and Labour 2007)</td>
</tr>
<tr>
<td></td>
<td>1.8% (ANC attendees; Somaliland Ministry of Health and Labour 2007)</td>
</tr>
</tbody>
</table>
MENA and are common among priority populations. It is estimated that the general prevalence of syphilis in MENA is at 1%.\textsuperscript{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.\textsuperscript{117} In the Islamic Republic of Iran, almost all FSWs reported a previous history of STDs and 60% reported frequent STD infections.\textsuperscript{118} Among truck drivers and youth, 31.9% and 27.9% reported a previous history of STDs, respectively.\textsuperscript{119} In Lebanon, a large study of general population women reported a

\begin{table}[h]
\centering
\begin{tabular}{|l|c|}
\hline
\textbf{Country} & \textbf{Syphilis prevalence} \\
\hline
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) \\
\hline
Turkey & 0.1\% (engaged couples; Alim et al. 2009) \\
 & 0.168\% (blood donors; Coskun et al. 2008) \\
 & 5.38\% (FSWs; Gul et al. 2008) \\
\hline
Yemen, Republic of & 2.0\% (general population; WHO/EMRO Regional Database on HIV/AIDS) \\
 & 4.9\% (FSWs; Stulhofer and Bolicevic 2008) \\
\hline
\end{tabular}
\end{table}

\textsuperscript{116} WHO/EMRO Regional Database on HIV/AIDS. \\
\textsuperscript{117} Todd et al., “Prevalence of and Barriers to Testing.” \\
\textsuperscript{118} Tehrani and Malek-Afzali, “Knowledge, Attitudes and Practices.” \\
\textsuperscript{119} Ibid.
Table 10.7 Gonorrhea Prevalence in Different Population Groups

<table>
<thead>
<tr>
<th>Country</th>
<th>Gonorrhea prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Djibouti</td>
<td>32.4% (promiscuous males; Fox et al. 1989)</td>
</tr>
<tr>
<td>Egypt, Arab Republic</td>
<td>2.8% (family planning attendees; El-Sayed et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>2.0% (ANC attendees; El-Sayed et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>2.7% (IDUs; El-Sayed et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>7.7% (FSWs; El-Sayed et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>8.8% (MSM; El-Sayed et al. 2002)</td>
</tr>
<tr>
<td>Iran, Islamic Republic</td>
<td>0.4% (a group of pregnant and nonpregnant women; Dezfulimanesh and Tehranian 2005)</td>
</tr>
<tr>
<td></td>
<td>1.0% (female prison inmates; Zangeneh 1999)</td>
</tr>
<tr>
<td></td>
<td>6.4% (obstetrics and gynecology clinics attendees; Chamani-Tabriz et al. 2007)</td>
</tr>
<tr>
<td>Jordan</td>
<td>0.7% (symptomatic hospital attendees; Jordan Ministry of Health 2004)</td>
</tr>
<tr>
<td></td>
<td>0.5% (asymptomatic hospital attendees; Jordan Ministry of Health 2004)</td>
</tr>
<tr>
<td></td>
<td>1.2% (symptomatic hospital attendees; As’ad 2004)</td>
</tr>
<tr>
<td></td>
<td>0.0% (asymptomatic hospital attendees; As’ad 2004)</td>
</tr>
<tr>
<td></td>
<td>0.6% (symptomatic hospital attendees; Mahafzah et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>0.9% (asymptomatic hospital attendees; Mahafzah et al. 2008)</td>
</tr>
<tr>
<td>Kuwait</td>
<td>31.5% (STD clinic attendees; Al-Mutairi et al. 2007)</td>
</tr>
<tr>
<td>Lebanon</td>
<td>0.0% (rural population; Deeb et al. 2003)</td>
</tr>
<tr>
<td>Morocco</td>
<td>3.2% (family planning center attendees; Ryan et al. 1998)</td>
</tr>
<tr>
<td></td>
<td>5.4% (symptomatic primary health care center attendees; Ryan et al. 1998)</td>
</tr>
<tr>
<td></td>
<td>0.9% (ANC attendees; WHO/EMRO Regional Database on HIV/AIDS)</td>
</tr>
<tr>
<td></td>
<td>1.74% (female STD clinic attendees; Heikel et al. 1999)</td>
</tr>
<tr>
<td></td>
<td>0.8% (female STD clinic attendees; WHO/EMRO Regional Database on HIV/AIDS)</td>
</tr>
<tr>
<td></td>
<td>7.07% (male STD clinic attendees; Heikel et al. 1999)</td>
</tr>
<tr>
<td></td>
<td>10.0% (STD clinic attendees; Ryan et al. 1998)</td>
</tr>
<tr>
<td></td>
<td>42.0% (STD clinic attendees; WHO/EMRO Regional Database on HIV/AIDS)</td>
</tr>
<tr>
<td></td>
<td>52.4% (STD clinic attendees; Alami et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>3.5% (FSWs; WHO/EMRO Regional Database on HIV/AIDS)</td>
</tr>
<tr>
<td>Pakistan</td>
<td>1%–4% (truck drivers; Pakistan National AIDS Control Program 2005a)</td>
</tr>
<tr>
<td></td>
<td>1%–2% (IDUs; Pakistan National AIDS Control Program 2005a)</td>
</tr>
<tr>
<td></td>
<td>1.3% (IDUs; Platt et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>0.0% (IDUs; Platt et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>10%–12% (FSWs; Pakistan National AIDS Control Program 2005a)</td>
</tr>
<tr>
<td></td>
<td>0%–18% (anal; MSWs; Pakistan National AIDS Control Program 2005a)</td>
</tr>
<tr>
<td></td>
<td>3%–6% (genital; MSWs; Pakistan National AIDS Control Program 2005a)</td>
</tr>
<tr>
<td></td>
<td>3%–4% (anal; hijras; Pakistan National AIDS Control Program 2005a)</td>
</tr>
<tr>
<td></td>
<td>15.0% (anal; hijras; Khan et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>4.0% (urethra; hijras; Khan et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>12.6% (anal; MSWs; banthas; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>11.1% (anal; MSWs; banthas; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>4.7% (anal; MSWs; khotkis; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>0.0% (anal; MSWs; khotkis; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>20.2% (anal; MSWs; khusras; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>6.3% (anal; MSWs; khusras; Hawkes et al. 2009)</td>
</tr>
<tr>
<td>Somalia</td>
<td>0.8% (ANC attendees; WHO 2004)</td>
</tr>
<tr>
<td></td>
<td>0.5% (STD clinic attendees; WHO 2004)</td>
</tr>
<tr>
<td></td>
<td>6.7% (STD clinic attendees; Burans et al. 1990)</td>
</tr>
<tr>
<td></td>
<td>11.2% (FSWs; Burans et al. 1990)</td>
</tr>
<tr>
<td>Turkey</td>
<td>0.0% (family planning clinic attendees; Ortayli, Bulut, and Nalbant 2001; Ortayli et al. 2001)</td>
</tr>
</tbody>
</table>
Table 10.8 Chlamydia Prevalence in Different Population Groups

<table>
<thead>
<tr>
<th>Country</th>
<th>Chlamydia prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria</td>
<td>100% (antichlamydia antibodies; obstetric clinic attendees; Kadi et al. 1989)</td>
</tr>
<tr>
<td></td>
<td>100% (antichlamydia antibodies; FSWs; Kadi et al. 1989)</td>
</tr>
<tr>
<td>Djibouti</td>
<td>5.7% (promiscuous males; Fox 1989)</td>
</tr>
<tr>
<td>Egypt, Arab Republic of</td>
<td>2.8% (family planning attendees; El-Sayed et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>1.3% (ANC attendees; El-Sayed et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>2.7% (IDUs; El-Sayed et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>7.7% (FSWs; El-Sayed et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>8.8% (MSM; El-Sayed et al. 2002)</td>
</tr>
<tr>
<td>Iran, Islamic Republic of</td>
<td>8.8% (male STI clinic attendees; Darougar et al. 1982)</td>
</tr>
<tr>
<td></td>
<td>9.3% (male patients with urethritis; Ghanaat et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>6.9% (FSWs; Darougar et al. 1983)</td>
</tr>
<tr>
<td>Jordan</td>
<td>1.3% (symptomatic hospital attendees; Jordan Ministry of Health 2004)</td>
</tr>
<tr>
<td></td>
<td>0.5% (asymptomatic hospital attendees; Jordan Ministry of Health 2004)</td>
</tr>
<tr>
<td></td>
<td>0.8% (symptomatic hospital attendees; As’ad 2004)</td>
</tr>
<tr>
<td></td>
<td>0.0% (asymptomatic hospital attendees; As’ad 2004)</td>
</tr>
<tr>
<td></td>
<td>0.9% (symptomatic hospital attendees; Mahafzah et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>2.2% (symptomatic hospital attendees; Mahafzah et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>3.9% (women attending infertility clinic; Al-Ramahi et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>0.7% (hospital attendees; Al-Ramahi et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>4.6% (symptomatic patients with urethritis; Al Ramahi et al. 2003)</td>
</tr>
<tr>
<td></td>
<td>3.9% (symptomatic patients with urethritis; Al Ramahi et al. 2008)</td>
</tr>
<tr>
<td>Kuwait</td>
<td>4.1% (STD clinic attendees; Al-Mutairi et al. 2007)</td>
</tr>
<tr>
<td>Lebanon</td>
<td>0.0% (rural population; Deeb et al. 2003)</td>
</tr>
<tr>
<td>Morocco</td>
<td>2.6% (family planning center attendees; Ryan et al. 1998)</td>
</tr>
<tr>
<td></td>
<td>6.3% (symptomatic primary health care center attendees; Ryan et al. 1998)</td>
</tr>
<tr>
<td></td>
<td>4.2% (ANC attendees; WHO/EMRO Regional Database on HIV/AIDS)</td>
</tr>
<tr>
<td></td>
<td>5.6% (female STD clinic attendees; WHO/EMRO Regional Database on HIV/AIDS)</td>
</tr>
<tr>
<td></td>
<td>51.5% (STD clinic attendees; Heikel et al. 1991)</td>
</tr>
<tr>
<td></td>
<td>6.0% (STD clinic attendees; WHO/EMRO Regional Database on HIV/AIDS)</td>
</tr>
<tr>
<td></td>
<td>17.1% (STD clinic attendees; Alami et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>5.0% (STD clinic attendees; Ryan et al. 1998)</td>
</tr>
<tr>
<td></td>
<td>19.1% (FSWs; WHO/EMRO Regional Database on HIV/AIDS)</td>
</tr>
<tr>
<td>Pakistan</td>
<td>1.0% (truck drivers; Pakistan National AIDS Control Program 2005a)</td>
</tr>
<tr>
<td></td>
<td>0%–1% (IDUs; Pakistan National AIDS Control Program 2005a)</td>
</tr>
<tr>
<td></td>
<td>0.7% (IDUs; Platt et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>0.0% (IDUs; Platt et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>5%–11% (FSWs; Pakistan National AIDS Control Program 2005a)</td>
</tr>
<tr>
<td></td>
<td>10.0% (anal; MSWs; Pakistan National AIDS Control Program 2005a)</td>
</tr>
<tr>
<td></td>
<td>1%–2% (genital; MSWs; Pakistan National AIDS Control Program 2005a)</td>
</tr>
<tr>
<td></td>
<td>29.0% (anal; hijras; Pakistan National AIDS Control Program 2005a)</td>
</tr>
<tr>
<td></td>
<td>0%–2% (genital; hijras; Pakistan National AIDS Control Program 2005a)</td>
</tr>
<tr>
<td></td>
<td>9.0% (anal; hijras; Khan et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>1.0% (urethral; hijras; Khan et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>4.7% (anal; MSWs; banthas; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>4.9% (anal; MSWs; banthas; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>3.6% (anal; MSWs; khothis; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>0.0% (anal; MSWs; khothis; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>9.9% (anal; MSWs; khusras; Hawkes et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>6.3% (anal; MSWs; khusras; Hawkes et al. 2009)</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>0.0% (asymptomatic females attending genitourinary or gynecological clinics; Massoud et al. 1991)</td>
</tr>
<tr>
<td></td>
<td>2.0% (asymptomatic males attending genitourinary or gynecological clinics; Massoud et al. 1991)</td>
</tr>
<tr>
<td></td>
<td>35.0% (symptomatic females attending genitourinary or gynecological clinics; Massoud et al. 1991)</td>
</tr>
<tr>
<td></td>
<td>46.0% (symptomatic males attending genitourinary or gynecological clinics; Massoud et al. 1991)</td>
</tr>
</tbody>
</table>
Table 10.8 (Continued)

<table>
<thead>
<tr>
<th>Country</th>
<th>Chlamydia prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Somalia</td>
<td>1.1% (ANC attendees; WHO 2004)</td>
</tr>
<tr>
<td></td>
<td>0.8% (STD clinic attendees; WHO 2004)</td>
</tr>
<tr>
<td></td>
<td>14.0% (STD clinic attendees; Ismail et al. 1990)</td>
</tr>
<tr>
<td>Sudan</td>
<td>1.2% (randomly sampled women in a suburban community; Kafi, Mohamed, and Musa 2000)</td>
</tr>
<tr>
<td>Turkey</td>
<td>1.9% (family planning clinic attendees; Ortayli et al. 2001)</td>
</tr>
<tr>
<td></td>
<td>1.9% (family planning clinic attendees; Ortayli, Bulut, and Nalbant 2001)</td>
</tr>
<tr>
<td></td>
<td>12.0% (registered FSWs; Agacidan et al. 1997)</td>
</tr>
<tr>
<td></td>
<td>14.4% (unregistered FSWs; Agacidan et al. 1997)</td>
</tr>
<tr>
<td></td>
<td>12.9% (FSWs; Agacidan et al. 1997)</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>2.6% (female primary and secondary care attendees; Ghazal-Aswad et al. 2004)</td>
</tr>
<tr>
<td>West Bank and Gaza</td>
<td>8.0% (pregnant women; Lubbad and Al-Hindi 2007)</td>
</tr>
</tbody>
</table>

trichomonas prevalence of 0.53%.\textsuperscript{120} In Pakistan, 15%–45% of different risk groups, including IDUs, FSWs, MSWs, and hijras, reported having an STI in the past six months.\textsuperscript{121} Also in Pakistan, 3.2% of migrant workers had etiologically confirmed STI prevalence.\textsuperscript{122} In Sudan, 7.3% of ANC attendees were found to have multiple STIs.\textsuperscript{123} It appears that gonorrhea and chlamydia are the most common bacterial STIs among MSM in MENA.\textsuperscript{124}

A few studies have also documented chancroid in MENA, a bacterial STI characteristic of very high levels of risky behavior.\textsuperscript{125} This infection reappeared in Algeria in 1988 and was consistently associated with contacts with FSWs.\textsuperscript{126} The infection was also common among STD clinic attendees in Kuwait.\textsuperscript{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.\textsuperscript{128} It is estimated that there are 3.5 million curable (mainly bacterial) STIs every year among adults in MENA.\textsuperscript{129} The yearly incidence of the four leading curable STIs (gonorrhea, chlamydia, syphilis, and trichomonas) is estimated at 7% per person, per year.\textsuperscript{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.\textsuperscript{131} In the Islamic Republic of Iran, 850,000 STDs are registered annually.\textsuperscript{132} In Morocco, between 180,000 and 240,000 new STDs used to be reported annually in the late 1990s,\textsuperscript{133} but in recent years the number of reported cases has increased considerably (370,000 in 2005).\textsuperscript{134} Figure 10.5 shows the trend in STI notified cases in Morocco from 1992 to 2006.\textsuperscript{135} In Saudi Arabia, gonorrhea incidence was estimated at 4.9 per 100,000 persons per year,\textsuperscript{136} compared to 131.4 per 100,000 persons per year in the United States.\textsuperscript{137} In the Republic of Yemen, it is estimated that there are 150,000 to 170,000 new STDs per year.\textsuperscript{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

\textsuperscript{120} Karam et al., “Prevalence of Sexually Transmitted Infections.”
\textsuperscript{121} Pakistan National AIDS Control Program, “Report of the Pilot Study in Karachi & Rawalpindi.”
\textsuperscript{122} Faisal and Cleland, “Migrant Men.”
\textsuperscript{123} Ortashi, El Khidir, and Herieka, “Prevalence of HIV.”
\textsuperscript{124} WHO/EMRO, Strengthening Health Sector Response.
\textsuperscript{125} Brunham and Plummer, “A General Model.” Glasier et al., “Sexual and Reproductive Health.”
\textsuperscript{126} Boudghene-Stambouli and Merad-Boudia, “Chancroid in Algeria.”
\textsuperscript{127} Brunham and Plummer, “A General Model.” Al-Mutairi et al., “Clinical Patterns.”
\textsuperscript{128} WHO, Shaping the Future.
\textsuperscript{129} WHO, “Global Prevalence and Incidence.”
\textsuperscript{130} Glasier et al., “Sexual and Reproductive Health.”
\textsuperscript{131} WHO/EMRO, Prevention and Control.”
\textsuperscript{132} Iran Center for Disease Management, Three Month Statistics.
\textsuperscript{133} Heikel et al., “The Prevalence of Sexually Transmitted Pathogens.”
\textsuperscript{134} Morocco MOH, “Situation épidémiologique actuelle du VIH/SIDA au Maroc.”
\textsuperscript{135} WHO/EMRO data reported to the WHO office of the Eastern Mediterranean Region.
\textsuperscript{136} Madani, “Sexually Transmitted Infections in Saudi Arabia.”
\textsuperscript{137} CDC, “Tracking the Hidden Epidemics.”
\textsuperscript{138} Lambert, “HIV and Development Challenges in Yemen.”
abortions.\textsuperscript{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.\textsuperscript{140} Among general population women in Egypt, 19.7% of women self-reported STI symptoms in the previous 12 months,\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.

It is estimated that about 1.5 million unsafe abortions occurred in MENA in 2003,\textsuperscript{144} out of a world total of about 19 million.\textsuperscript{145} Unsafe abortions account for 11% of maternal deaths in MENA,\textsuperscript{146} compared to 30% of all maternal deaths globally.\textsuperscript{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
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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.

**BIBLIOGRAPHY**


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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. 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. 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, the Islamic Republic of Iran, Saudi Arabia, and the West Bank and Gaza. Quite often the blood or the blood products were imported.

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). In Egypt, recipients of blood or blood products had an HIV prevalence of 4.8% in the period from 1986 to 1990. In Lebanon, multi-transfused patients had an HIV prevalence of 6%. In Qatar, more than 75% of reported HIV infections up to 1989 were acquired via transfusion of imported blood, and 38.5% of

1 Grassly et al., “The Effectiveness of HIV Prevention.”
children with thalassemia were found to be HIV positive. In Saudi Arabia, 1.3% of multitransfused thalassemic and sickle cell disease patients tested positive for HIV, and 34.5% of HIV-positive children became infected through blood or blood products.

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. HIV prevalence was 4.3% among 540 Saudi hemodialysis patients who received a commercial kidney transplant in India.

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. 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. It is believed that currently only 30% of all donated blood is screened in Afghanistan.

The majority of reported infections acquired by a mode other than blood or blood products were either related to sexual or injecting drug exposures abroad or acquired by sexual partners of those who worked or lived abroad. 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. 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. In Lebanon, 45.36% of notified HIV/AIDS cases up to 2004 were linked to travel abroad. Half of reported AIDS cases in the Republic of Yemen were linked to traveling abroad.

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. In the West Bank and Gaza, HIV cases appeared among migrant workers working legally or illegally in Israel. In Oman, a number of HIV cases were related to Omani historical links to East Africa. In Pakistan, the majority of cases were acquired through contacts with female sex workers (FSWs) while working in the Persian Gulf region. In Tunisia, HIV infections were found among Tunisian injecting drug users (IDUs) deported from France. Generally, HIV infections in Maghreb countries were linked to exposures in Western Europe.

A number of HIV sero-prevalence studies that were conducted in MENA in the 1980s and early 1990s included Djibouti, Egypt, the Islamic Republic of Iran, Jordan, Lebanon.
groups, such as high school students, it was prevalence was still nil in general population. prevalence among these sex workers appeared to be 41.7% in 1990. By the early 1990s, HIV prevalence among street-based FSWs, the most vulnerable of sex work- ers, increased tenfold from 4.6% in 1987 to 4.6% in 1990, it was rising rapidly among these sex workers. 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.

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. Although HIV prevalence was still nil in general population groups, such as high school students, 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. By the early 1990s, HIV prevalence among these sex workers appeared to be at levels as high as 70%. The epidemic among bar-based FSWs was also growing rapidly. Over this period, it was documented by individual studies to be 1.4%, 2.7%, 5%, 7%, 14.2%, 15.3%, 21.7%, and 25.6%.

While HIV prevalence was stabilizing among FSWs by about 1990, it was rising rapidly among their clients. The HIV prevalence among STD clinic attendees increased fivefold between 1990 and 1991 and reached 10.4%. 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.

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 country). 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. Although Djibouti was predicted to have a skyrocketing epidemic a decade ago, this has not materialized. 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.”
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.”
43 Rota et al., “HIV Antibody Screening”; Demir 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.”
50 Couzineau et al., “Prevalence of Infection.”
51 Etchepare, “Programme National de Lutte.”
52 Ibid.
53 Ibid.
54 Ibid.
55 Ibid.
56 Ibid.
57 Ibid.
58 Ibid.
60 Rodier et al., “Programme National de Lutte.”
61 Rodier et al., “Infection by the Human Immunodeficiency Virus.”
63 Marcelin et al., “Kaposi’s Sarcoma Herpesvirus.”
64 WHO, “Summary Country Profile.”
65 UNAIDS, “Notes on AIDS in the Middle East and North Africa.”
66 O’Grady, “WFP Consultant Visit to Djibouti Report.”
CONCEPTUAL FRAMEWORK: DYNAMICS OF HIV INFECTION 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 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.

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.

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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”.
68  Ministry of Health and Medical Education of Iran, “Treatment and Medical Education”.
69 Afshar, “Health and Prison.”
70 Ministry of Health and Medical Education of Iran, “Treatment and Medical Education”.
72 Eftekhari et al., “Biobehavioural Survey on HIV.”
74 Ministry of Health and Medical Education of Iran, “Treatment and Medical Education.”
75 Ramezani, Mohraz, and Gachkar, “Epidemiologic Situation”; Burrows, Widak, 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.”
81 Bayoumi, Baseline Survey of Intravenous Drug Users.
82 Aceijas et al., “Global Overview”; Tawilah and Tawil, Visit to Sultan of Oman; Oman MOH, “HIV Risk among Heroin and Injecting Drug Users.”
84 Elrashied, “Prevalence.”
87 Fares et al., Rapport sur l’enquête nationale.
88 UNAIDS, “Notes on AIDS in the Middle East and North Africa.”
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>
<thead>
<tr>
<th>Country</th>
<th>Concentrated epidemic among IDUs</th>
<th>Concentrated epidemic among MSM</th>
<th>Concentrated epidemic among FSWs</th>
<th>Generalized epidemic</th>
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<tbody>
<tr>
<td>Afghanistan</td>
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</tr>
<tr>
<td></td>
<td>Unknown (out of Kabul)</td>
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<td>Possibly (southern part of Algeria)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Apparently not (rest of country)</td>
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</tr>
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<td>Unknown</td>
<td>Unlikely</td>
</tr>
<tr>
<td>Djibouti</td>
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<td>Unknown</td>
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<td>Established</td>
</tr>
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<td>Egypt, Arab Rep. of.</td>
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<td>Possibly</td>
<td>Apparently not</td>
<td>Unlikely</td>
</tr>
<tr>
<td>Iran, Islamic Rep. of.</td>
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<td>Apparently not</td>
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</tr>
<tr>
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<td>Unlikely</td>
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<td>Apparently not</td>
<td>Unlikely</td>
</tr>
<tr>
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<td>Unlikely</td>
</tr>
<tr>
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<td>Unlikely</td>
</tr>
<tr>
<td>Somalia</td>
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<td>Unknown</td>
<td>Likely</td>
<td>Possibly in some parts</td>
</tr>
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<td>Yemen, Rep. of</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Apparently not</td>
<td>Unlikely</td>
</tr>
</tbody>
</table>

*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 have occurred in the priority and bridging populations. 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.

**Figure 11.1 Analytical View of HIV Epidemiology in MENA**

![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). 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. HIV prevalence in Southern Sudan is estimated to be up to eight times higher than that in the capital, Khartoum. 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. 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. However, the number of case notifications has been increasing in recent years. The large fraction of AIDS cases among newly discovered HIV infections and the short interval from HIV notification to AIDS diagnosis 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, 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, 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
site in Karachi, but the prevalence increased to 23% at this site by mid-2004. 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. 

**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.

**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. 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.

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 sex; prohibitions against alcohol consumption because of alcohol’s strong association with higher risk behavior, paying for sex, and misuse of protective measures such as condoms; closed sexual networks of monogamous or polygamous marriages; prohibition against intercourse during menstruation; and possibly ritual washing and penile and vaginal hygiene following intercourse. Being a Muslim has been repeatedly associated with lower risk behavior, and lower HIV prevalence in Muslim-majority countries as well as in Muslim minorities in predominantly non-Muslim nations. Islamic religiosity was found in one study not to be associated with lower use of condoms for...
those who are sexually active. Islamic cultural traditions have been cited as a protective factor even after adjustment for male circumcision.

While Islamic values provide protection against HIV/AIDS, 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. What is promoted religiously is not necessarily what is put into practice. 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. 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 mores 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. 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. If HIV establishes itself in one priority population, it can easily find ways to spread through the overlapping risks to other priority populations.

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. 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

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118 Gilbert, “The Influence of Islam.”
119 Hargrove, “Migration, Mines and Mores.”
120 Ridanovic, “AIDS and Islam.”
122 Ridanovic, “AIDS and Islam.”
123 Busulwa, “HIV/AIDS Situation Analysis Study.”
125 UNAIDS, “Fact Sheet on Drug Use.”
126 Pakistan National AIDS Control Program, HIV Second Generation Surveillance (Rounds I, II, and III); Eftekhar et al., “Bio-Behavioural Survey on HIV.”
acquired the infection sexually, acquired the infection from their husbands.²²⁸ Seventy-six percent of HIV-positive women in the Islamic Republic of Iran acquired the infection from their husbands, who were predominantly IDUs.²²⁹ HIV infections are repeatedly found among pregnant women with no identifiable risk behaviors, suggesting that the risk factor is heterosexual sex with the spouse.²³⁰ 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.²³¹ 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.²³² Marginalization of priority groups is contributing to the vulnerability of these groups to HIV infection.²³³

**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,²³⁴ long duration of latent infection, and slow disease progression²³⁵ 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.²³⁶

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²²⁸ Alrajhi, Halim, and Al-Abdely, “Mode of Transmission of HIV-1.”
²³¹ World Bank, “Mapping and Situation Assessment.”
²³² Galama and Dondero, “HIV Surveillance in Complex Emergencies.”
²³³ Trouiri et al., “Study of Psychosocial Factors.”
²³⁴ Wawer et al., “Rates of HIV-1 Transmission per Coital Act.”
²³⁵ Mellors et al., “Prognosis in HIV-1 Infection.”
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, 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, 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%, 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. 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. Furthermore, the near universal coverage of male circumcision and the apparently lower risk behaviors in commercial sex networks...
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.

BIBLIOGRAPHY


Characterizing the HIV/AIDS Epidemic in the Middle East and North Africa


Ministry of Health and Medical Education of Iran. 2006. “Treatment and Medical Education.” Islamic Republic of Iran HIV/AIDS situation and response analysis.


Characterizing the HIV/AIDS Epidemic in the Middle East and North Africa


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. 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. 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, 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. 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

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2 UNAIDS and ASAP, “Review of National AIDS Strategic Plan.”


4 G. Riedner, personal communication (2008), and site visits to drop-in centers in Tangier and Tetouane.
Skoun. Skoun. 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. 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. A few NGOs in the Arab Republic of Egypt are providing sterile needles and syringes to IDUs through outreach. Oman is reviewing its national policies and regulations to assess the need for and feasibility of OST.

A regional civil society movement has formed and is called the Middle East and North Africa Harm Reduction Association (MENAHRA). MENHARA’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. MENAHRA includes three subregional knowledge hubs: Lebanon’s hub is hosted by an NGO (SICD [Soins Infirmiers et Developpement Communaute]), 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 MENAHRA 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. The majority of MSM in the study indicated that they face exclusion from their communities and families. 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. 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.

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.”
7 WHO/EMRO, unpublished country information.
8 Aziz et al., “The Impact of Harm Reduction.”
9 Skoun, “New Perspectives.”
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 Algerie 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.

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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.”
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. The Islamic Republic of Iran has spearheaded a peer education program in schools that has trained thousands of students to educate peers on HIV. 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. 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. In Sudan, an intervention for youth has provided over 300,000 young people with health education sessions covering various topics.

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
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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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

\textsuperscript{24} Semini, Njogou, and Mortagy, UNHCR/UNAIDS Joint Mission.
\textsuperscript{25} UNAIDS/AMG, Recommendations for Interventions.
\textsuperscript{26} Lebanon National AIDS Control Program, “A Case Study.”
\textsuperscript{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 thematics other than AIDS that have community access and the trust of the populations, but not necessarily the required competence on HIV-related services.

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, 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. Conversely, in the Syrian Arab Republic, 10% FSWs reported drug injection.

A study in Alexandria, Egypt, showed that 10.9% of MSM had injected drugs in the previous 12 months. 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. 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. 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,

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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.”
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.

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 MENA; two-thirds of them are living in Pakistan and Sudan. Only 9,622 PLHIV in need of ART were reportedly receiving treatment. Accordingly, in 2007, the

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.

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. Afghanistan and Pakistan report that 39% and 87%, respectively, of donated blood units were screened for HIV in a quality assured manner. No data were available for Sudan, the West Bank and Gaza, and the Republic of Yemen.

35 UNAIDS, “Notes on AIDS in the Middle East and North Africa.”
37 Ibid.
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 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

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**Table 12.1 Number of PLHIV on ART in Selected Countries, 2006–08**

<table>
<thead>
<tr>
<th>Country</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Djibouti</td>
<td>578</td>
<td>705</td>
<td>816</td>
</tr>
<tr>
<td>Iran, Islamic Rep. of</td>
<td>522</td>
<td>827</td>
<td>921</td>
</tr>
<tr>
<td>Morocco</td>
<td>1,370</td>
<td>1,648</td>
<td>2,207</td>
</tr>
<tr>
<td>Pakistan</td>
<td>164</td>
<td>523</td>
<td>907</td>
</tr>
<tr>
<td>Somalia</td>
<td>111</td>
<td>211</td>
<td>413</td>
</tr>
<tr>
<td>Sudan</td>
<td>986</td>
<td>1,198</td>
<td>2,317</td>
</tr>
<tr>
<td>Yemen, Republic of</td>
<td>0</td>
<td>107</td>
<td>189</td>
</tr>
</tbody>
</table>

offered ART in Pakistan, 0.9 in Somalia, 0.4 in Sudan, and 0.6 in the Republic of Yemen.\textsuperscript{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.\textsuperscript{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,\textsuperscript{47} though noncompliance and treatment interruptions have been observed, for example, in Oman.\textsuperscript{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.\textsuperscript{49} This suggests the need for education and counseling programs to ensure that patients understand ART and thereby improve adherence.\textsuperscript{50} There is also evidence of obtaining drugs with no prescription and no clinical and psychosocial support.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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\%).\textsuperscript{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

\textsuperscript{45} WHO/EMRO, “Progress towards Universal Access” (2007).


\textsuperscript{47} Benjaber, Rey, and Himmich, “A Study on Antiretroviral Treatment.”

\textsuperscript{48} Al Dhahry et al., “Human Immunodeficiency Virus.”

\textsuperscript{49} Benjaber, Rey, and Himmich, “A Study on Antiretroviral Treatment.”

\textsuperscript{50} Ibid.

\textsuperscript{51} Shah et al., “Antiretroviral Drugs.”

\textsuperscript{52} UNAIDS, “Notes on AIDS in the Middle East and North Africa.”

\textsuperscript{53} Djibouti National AIDS Programme, “Programme de lutte contre le sida.”

\textsuperscript{54} WHO/EMRO, “Progress towards Universal Access” (2007).

\textsuperscript{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.

BIBLIOGRAPHY


A Pilot Experience.” International Conference on the Reduction of Drug Related Harm, Warsaw, abstract.


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

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\(^1\) El Feki, “Middle-Eastern AIDS Efforts.”


\(^3\) 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.”
\(^{6}\) 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 the 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. 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.”
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.

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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.”
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.”
33 Jenkins et al., “Male Prostitutes.”
35 Jenkins and Robalino, “HIV in the Middle East and North Africa.”
36 Buse, “Political Feasibility of Scaling-Up.”
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.

Interventions need to capitalize on the strengths represented by cultural traditions, and yet be culturally sensitive while fostering effective responses to the epidemic. 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 infection 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.

Intervention methodology should emphasize identifying places, rather than individuals, where high-risk sexual or injecting activities are present. 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. 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.

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. 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. 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. Anonymous testing needs to be expanded, and it has already proved its utility in attracting hidden populations.

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. 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. Careful analysis of the transmission patterns must be conducted to inform policy decisions.

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.

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38 Razaghi et al., “Profiles of Risk.”
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.”
47 MacKellar et al., “Unrecognized HIV Infection.”
49 Pisani et al., “Back to Basics in HIV Prevention.”
51 Ainsworth and Teokul, “Breaking the Silence.”
Characterizing the HIV/AIDS Epidemic in the Middle East and North Africa

Ministry of Health and Medical Education of Iran. 2006. “Treatment and Medical Education.” Islamic Republic of Iran HIV/AIDS situation and response analysis.


Table A.1 Estimated Number of People Living with HIV in MENA Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of PLHIV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>Not available</td>
</tr>
<tr>
<td>Algeria</td>
<td>21,000 (11,000–43,000)</td>
</tr>
<tr>
<td>Bahrain</td>
<td>Not available</td>
</tr>
<tr>
<td>Djibouti</td>
<td>16,000 (12,000–19,000)</td>
</tr>
<tr>
<td>Egypt, Arab Rep. of</td>
<td>9,200 (7,200–13,000)</td>
</tr>
<tr>
<td>Iran, Islamic Rep. of</td>
<td>86,000 (68,000–110,000)</td>
</tr>
<tr>
<td>Iraq</td>
<td>Not available</td>
</tr>
<tr>
<td>Jordan</td>
<td>Not available</td>
</tr>
<tr>
<td>Kuwait</td>
<td>Not available</td>
</tr>
<tr>
<td>Lebanon</td>
<td>3,000 (1,700–7,200)</td>
</tr>
<tr>
<td>Libya</td>
<td>Not available</td>
</tr>
<tr>
<td>Morocco</td>
<td>21,000 (15,000–31,000)</td>
</tr>
<tr>
<td>Oman</td>
<td>Not available</td>
</tr>
<tr>
<td>Pakistan</td>
<td>96,000 (69,000–150,000)</td>
</tr>
<tr>
<td>Qatar</td>
<td>Not available</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>Not available</td>
</tr>
<tr>
<td>Somalia</td>
<td>24,000 (13,000–45,000)</td>
</tr>
<tr>
<td>Sudan</td>
<td>320,000 (220,000–440,000)</td>
</tr>
<tr>
<td>Syrian Arab Republic</td>
<td>Not available</td>
</tr>
<tr>
<td>Tunisia</td>
<td>3,700 (2,700–5,400)</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>Not available</td>
</tr>
<tr>
<td>West Bank and Gaza</td>
<td>Not available</td>
</tr>
<tr>
<td>Yemen, Rep. of</td>
<td>Not available</td>
</tr>
</tbody>
</table>

Note: PLHIV = people living with HIV. Numbers within parentheses indicate the range within which the estimate could lie.
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). The size of the GST in any community determines the potential size of the STI epidemic. Different STIs have different GST sizes.

### Table B.1 Threshold for Sustainable Transmission and Transmission Probability per Partnership for Key STIs

<table>
<thead>
<tr>
<th>STI</th>
<th>Duration of infectiousness in years</th>
<th>Transmission probability per partnership</th>
<th>Effective mean rate of new sexual partner acquisition per year for sustainable transmission</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1-Year partnership</td>
<td>10-Year partnership</td>
</tr>
<tr>
<td>Gonorrhea</td>
<td>0.5</td>
<td>0.50</td>
<td>0.50</td>
</tr>
<tr>
<td>Chlamydia</td>
<td>1.25</td>
<td>0.20</td>
<td>0.20</td>
</tr>
<tr>
<td>Syphilis</td>
<td>0.5</td>
<td>0.30</td>
<td>0.30</td>
</tr>
<tr>
<td>Chancroid</td>
<td>0.08</td>
<td>0.80</td>
<td>0.80</td>
</tr>
<tr>
<td>Herpes simplex virus type 2</td>
<td>Chronic reactivations for lifetime</td>
<td>0.20</td>
<td>0.89</td>
</tr>
<tr>
<td>Human papillomavirus</td>
<td>Chronic</td>
<td>-1.00</td>
<td>-1.00</td>
</tr>
<tr>
<td>Human immunodeficiency virus−1</td>
<td>10</td>
<td>0.16</td>
<td>0.83</td>
</tr>
</tbody>
</table>

---

**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”
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 B
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**

<table>
<thead>
<tr>
<th>Country</th>
<th>HIV prevalence among different population groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahrain</td>
<td>0.0% (outpatient pediatric clinic; Al-Mahroos and Ebrahim 1995)</td>
</tr>
<tr>
<td>Djibouti</td>
<td>0.0% (women; Marcelin et al. 2001)</td>
</tr>
<tr>
<td></td>
<td>5.0% (women; Marcelin et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>5.0% (men; Marcelin et al. 2002)</td>
</tr>
<tr>
<td>Egypt, Arab Republic of</td>
<td>0.0% (different population groups; Constantine et al. 1990)</td>
</tr>
<tr>
<td></td>
<td>0.0% (tourism workers; El-Sayed et al. 1996)</td>
</tr>
<tr>
<td></td>
<td>0.18% (fever patients; Watts et al. 1993)</td>
</tr>
<tr>
<td></td>
<td>1.9% (sexual contacts of HIV patients; Watts et al. 1993)</td>
</tr>
<tr>
<td></td>
<td>0.07% (international travelers; Watts et al. 1993)</td>
</tr>
<tr>
<td></td>
<td>0.97% (non-Egyptian residents; Watts et al. 1993)</td>
</tr>
<tr>
<td></td>
<td>0.0% (hospital patients; El-Ghazzawi, Hunsmann, and Schneider 1987)</td>
</tr>
<tr>
<td></td>
<td>0.0% (control group in a study; El-Ghazzawi et al. 1995)</td>
</tr>
<tr>
<td></td>
<td>0.0% (fire brigade personnel; Quinti et al. 1995; Renganathan et al. 1995)</td>
</tr>
<tr>
<td></td>
<td>0.0% (university students; El-Gilany and El-Fedawy 2006)</td>
</tr>
<tr>
<td>Iran, Islamic Republic of</td>
<td>0.34% (healthy children; Karimi and Ghavanini 2001)</td>
</tr>
<tr>
<td></td>
<td>1.8% (gypsy population; Hosseini Asl, Avijgan, and Mohamadnejad 2004)</td>
</tr>
<tr>
<td></td>
<td>0.0% (runaways and other women seeking safe haven; Hajiabdolbaghi et al. 2007)</td>
</tr>
<tr>
<td>Jordan</td>
<td>0.0% (public employees; Zamani et al. 2005; Razzaghi et al. 2006; Ministry of Health and Medical Education of Iran 2006; Afshar [date unknown]); Afshar and Kasrace 2005; WHO/EMRO 2004)</td>
</tr>
<tr>
<td></td>
<td>0.0% (military personnel; Jordan National AIDS Program, personal communication)</td>
</tr>
<tr>
<td></td>
<td>0.0% (prisoners; Jordan National AIDS Program, personal communication)</td>
</tr>
<tr>
<td></td>
<td>0.64% (at-risk populations; Anonymous 2006)</td>
</tr>
<tr>
<td>Mauritania</td>
<td>0.28% (general population; Baidy et al. 1993)</td>
</tr>
<tr>
<td>Morocco</td>
<td>0.0% (newly recruited employees; Morocco MOH 2007)</td>
</tr>
<tr>
<td></td>
<td>0.0% (people seeking a health insurance card; Morocco MOH 2007)</td>
</tr>
<tr>
<td></td>
<td>0.0% (traditional barbers and their customers; Zahraoui-Mehadji et al. 2004)</td>
</tr>
<tr>
<td></td>
<td>0.10% (STD clinic attendees, pregnant women, and patients with pulmonary tuberculosis; Elharti et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>0.0% (women at family planning clinics; WHO/EMRO Regional Database on HIV/AIDS)</td>
</tr>
<tr>
<td></td>
<td>0.32% (seasonal female laborers; Khattabi and Alami 2005)</td>
</tr>
<tr>
<td></td>
<td>0.72% (seasonal female laborers; Bennani and Alami 2006)</td>
</tr>
<tr>
<td></td>
<td>0.75% (seasonal female laborers; Morocco MOH 2007)</td>
</tr>
<tr>
<td></td>
<td>5.26% (male laborers; Khattabi and Alami 2005)</td>
</tr>
<tr>
<td></td>
<td>0.0% (male laborers; Bennani and Alami 2006)</td>
</tr>
<tr>
<td></td>
<td>0.0% (hotel staff; Khattabi and Alami 2005)</td>
</tr>
<tr>
<td></td>
<td>0.16% (hotel staff; Bennani and Alami 2006)</td>
</tr>
<tr>
<td></td>
<td>0.12% (hotel staff; Morocco MOH 2007)</td>
</tr>
<tr>
<td>Mauritania</td>
<td>0.28% (general population; Baidy et al. 1993)</td>
</tr>
<tr>
<td>Morocco</td>
<td>0.0% (newly recruited employees; Morocco MOH 2007)</td>
</tr>
<tr>
<td></td>
<td>0.0% (people seeking a health insurance card; Morocco MOH 2007)</td>
</tr>
<tr>
<td></td>
<td>0.0% (traditional barbers and their customers; Zahraoui-Mehadji et al. 2004)</td>
</tr>
<tr>
<td></td>
<td>0.10% (STD clinic attendees, pregnant women, and patients with pulmonary tuberculosis; Elharti et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>0.0% (women at family planning clinics; WHO/EMRO Regional Database on HIV/AIDS)</td>
</tr>
<tr>
<td></td>
<td>0.32% (seasonal female laborers; Khattabi and Alami 2005)</td>
</tr>
<tr>
<td></td>
<td>0.72% (seasonal female laborers; Bennani and Alami 2006)</td>
</tr>
<tr>
<td></td>
<td>0.75% (seasonal female laborers; Morocco MOH 2007)</td>
</tr>
<tr>
<td></td>
<td>5.26% (male laborers; Khattabi and Alami 2005)</td>
</tr>
<tr>
<td></td>
<td>0.0% (male laborers; Bennani and Alami 2006)</td>
</tr>
<tr>
<td></td>
<td>0.0% (hotel staff; Khattabi and Alami 2005)</td>
</tr>
<tr>
<td></td>
<td>0.16% (hotel staff; Bennani and Alami 2006)</td>
</tr>
<tr>
<td></td>
<td>0.12% (hotel staff; Morocco MOH 2007)</td>
</tr>
</tbody>
</table>
Table C.1 (Continued)

<table>
<thead>
<tr>
<th>Country</th>
<th>HIV prevalence among different population groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pakistan</td>
<td>0.23% (15,000 individuals with various characteristics including people suspected of living with HIV; Kayani et al. 1994)</td>
</tr>
<tr>
<td></td>
<td>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)</td>
</tr>
<tr>
<td></td>
<td>0.064% (general population; Hyder and Khan 1998)</td>
</tr>
<tr>
<td></td>
<td>5.4% (men reporting extramarital contacts; Hyder and Khan 1998)</td>
</tr>
<tr>
<td></td>
<td>0.97% (blood donors and recipients, IDUs, and suspected AIDS cases; Khanani et al. 1990)</td>
</tr>
<tr>
<td></td>
<td>0.06% (blood donors and deported Pakistanis from Persian Gulf countries; Tariq et al. 1993)</td>
</tr>
<tr>
<td></td>
<td>0.0% (IDUs in rehabilitation centers and drug-related arrestees; Khawaja et al. 1997)</td>
</tr>
<tr>
<td></td>
<td>0.1% (high-risk and low-risk populations; Razig, Alam, and Ali 1993)</td>
</tr>
<tr>
<td></td>
<td>0.007% (general population; Khattak et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>0.0% (two surveys; earthquake victims; Khan et al. 2008)</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>0% (controls in a study; Bakir et al. 1995)</td>
</tr>
<tr>
<td>Somalia</td>
<td>0.0% (military cadets; Corwin et al. 1991)</td>
</tr>
<tr>
<td></td>
<td>0.0% (blood donors and hospitalized children and adults; Nur et al. 2000)</td>
</tr>
<tr>
<td></td>
<td>0.0% (women and neonates; Jama et al. 1987)</td>
</tr>
<tr>
<td></td>
<td>0.0% (hospitalized persons; Scott et al. 1991)</td>
</tr>
<tr>
<td></td>
<td>1.0% (hospitalized persons; Kulane et al. 2000)</td>
</tr>
<tr>
<td>Sudan</td>
<td>1.1% (general population; Southern Sudan; Arbesser, Mose, and Sixl 1987)</td>
</tr>
<tr>
<td></td>
<td>2.7% (general population; Southern Sudan; NSNAC and UNAIDS 2006)</td>
</tr>
<tr>
<td></td>
<td>4.3% (women; Southern Sudan; NSNAC and UNAIDS 2006)</td>
</tr>
<tr>
<td></td>
<td>1.0% (general population; Malakal, Southern Sudan; IGAD 2006)</td>
</tr>
<tr>
<td></td>
<td>7.2% (general population; Yambio, Southern Sudan; IGAD 2006)</td>
</tr>
<tr>
<td></td>
<td>12.0% (tea sellers; Southern Sudan; NSNAC and UNAIDS 2006)</td>
</tr>
<tr>
<td></td>
<td>3.0% (female outpatients; Southern Sudan; McCarthy, Khalid, and El Tigani 1995)</td>
</tr>
<tr>
<td></td>
<td>3.0% (outpatients; Juba; Southern Sudan; UNAIDS 2007b; UNAIDS 2007a)</td>
</tr>
<tr>
<td></td>
<td>4.0% (outpatients; Juba; Southern Sudan; UNAIDS 2007b; UNAIDS 2007a)</td>
</tr>
<tr>
<td></td>
<td>0.8% (pregnant women and STI patients; Komo and Ardi Kanan; Southern Sudan; NSNAC and UNAIDS 2006)</td>
</tr>
<tr>
<td></td>
<td>1.1% (university students; North Sudan; Ahmed 2004i)</td>
</tr>
<tr>
<td></td>
<td>1.2% (women in a suburban community in Khartoum; North Sudan; Kafi, Mohamed, and Musa 2000)</td>
</tr>
<tr>
<td></td>
<td>2.5% (tea sellers; North Sudan; UNAIDS 2008; Ahmed 2004i)</td>
</tr>
<tr>
<td></td>
<td>0.4% (tea sellers; North Sudan; Anonymous 2007)</td>
</tr>
<tr>
<td></td>
<td>0.2% (patients with various malignancies and normal subjects; North Sudan; Fahal et al. 1995)</td>
</tr>
<tr>
<td></td>
<td>0.12% (hospital attendees; North Sudan; Ahli 2005)</td>
</tr>
<tr>
<td></td>
<td>1.0% (police officers in Khartoum; North Sudan; Abdelwashab 2006)</td>
</tr>
<tr>
<td>Turkey</td>
<td>0.1% (engaged couples; Alim et al. 2009)</td>
</tr>
<tr>
<td>Yemen, Republic of</td>
<td>0.0%, 0.17%, 1.26%, and 1.19% (travelers seeking visas to work abroad in different years, respectively; WHO, UNICEF, and UNAIDS 2008s)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Country</th>
<th>HIV prevalence among STD clinic attendees, VCT attendees, and people suspected of living with HIV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria</td>
<td>2.0% (Institut de Formation Paramédicale de Parnet 2004)</td>
</tr>
<tr>
<td></td>
<td>1.24% (Unknown, “Statut de la réponse nationale”)</td>
</tr>
<tr>
<td></td>
<td>1.26% (Unknown, “Statut de la réponse nationale”)</td>
</tr>
<tr>
<td></td>
<td>0.25% (Alami 2009)</td>
</tr>
<tr>
<td></td>
<td>1.19% (Alami 2009)</td>
</tr>
<tr>
<td></td>
<td>2.4% (Alami 2009)</td>
</tr>
<tr>
<td>Djibouti</td>
<td>1.0% (Fox et al. 1989)</td>
</tr>
<tr>
<td></td>
<td>10.4% (Rodier et al. 1993)</td>
</tr>
<tr>
<td>Egypt, Arab Republic of</td>
<td>0.0% (Saleh et al. 2000)</td>
</tr>
<tr>
<td></td>
<td>0.23% (Watts et al. 1993)</td>
</tr>
<tr>
<td></td>
<td>8.4% (Ali et al. 1998)</td>
</tr>
<tr>
<td>Iran, Islamic Republic of</td>
<td>4.1% (Ghannad et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>2.0% (Ghannad et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>2.2% (Ghannad et al. 2009)</td>
</tr>
<tr>
<td>Kuwait</td>
<td>0.0% (Al-Owaish et al. 2000)</td>
</tr>
<tr>
<td></td>
<td>0.0% (Al-Fouzan and Al-Mutairi 2004)</td>
</tr>
<tr>
<td></td>
<td>0.0% (Al-Mutairi et al. 2007)</td>
</tr>
<tr>
<td>Morocco</td>
<td>0.15% (Khattabi and Alami 2005)</td>
</tr>
<tr>
<td></td>
<td>0.08% (Khattabi and Alami 2005)</td>
</tr>
<tr>
<td></td>
<td>0.25% (Khattabi and Alami 2005)</td>
</tr>
<tr>
<td></td>
<td>0.16% (Khattabi and Alami 2005)</td>
</tr>
<tr>
<td></td>
<td>0.1 (women; Ryan et al. 1998)</td>
</tr>
<tr>
<td></td>
<td>0.3% (women; Ryan et al. 1998)</td>
</tr>
<tr>
<td></td>
<td>2.9% (Ryan et al. 1998)</td>
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<tr>
<td></td>
<td>0.0% (men; WHO/EMRO Regional Database on HIV/AIDS)</td>
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<tr>
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<td>0.2% (women; WHO/EMRO Regional Database on HIV/AIDS)</td>
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<tr>
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<td></td>
<td>0.62% (Heikel et al. 1999)</td>
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<td></td>
<td>5.0% (attendees with high risk and/or symptoms; Elmir et al. 2002)</td>
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<td>0.10% (Khattabi and Alami 2005; Elharti et al. 2002)</td>
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<td>0.25% (Elharti et al. 2002)</td>
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<td></td>
<td>0.34% (Khattabi and Alami 2005)</td>
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<td></td>
<td>0.26% (Khattabi and Alami 2005)</td>
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<td></td>
<td>0.19% (Morocco MOH 2007)</td>
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<tr>
<td>Country</td>
<td>HIV prevalence among STD clinic attendees, VCT attendees, and people suspected of living with HIV</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Pakistan</td>
<td>0.0% (Iqbal and Rehan 1996) 0.0% (Mujeeb and Hafeez 1993) 0.3% (Shrestha 1996) 6.1% (Shrestha 1996) 0.22% (Rehan 2006)</td>
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<td>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)</td>
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<tr>
<td>Sudan</td>
<td>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) 1.88% (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)</td>
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<td>1.8% (Sellami et al. 2003)</td>
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<tr>
<td>Yemen, Republic of</td>
<td>1.8% (Al-Serouri 2005; WHO, UNICEF, and UNAIDS 2006s)</td>
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### Table D.2 HIV Prevalence of Tuberculosis (TB) Patients

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<td></td>
<td>44.4% (estimate; WHO 2005)</td>
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<td></td>
<td>10.1% (estimate; Djibouti National TB Programme 2006)</td>
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<td>Iran, Islamic Republic of</td>
<td>1.8% [WHO/EMRO 2007]</td>
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<td></td>
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<td></td>
<td>0.0% (estimate; Iraq National TB Programme 2006)</td>
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<td>Jordan</td>
<td>0.0% (Jordan National TB Programme 2006)</td>
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<td>Kuwait</td>
<td>0.3% (Kuwait National TB Programme 2006)</td>
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<td>Lebanon</td>
<td>0.5% (estimate; Lebanon National TB Programme 2006)</td>
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<td>Mauritania</td>
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<td>Morocco</td>
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<td>0.34% (Khattabi and Alami 2005)</td>
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<tr>
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<td>1.6% (Alami 2009)</td>
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<tr>
<td></td>
<td>0.39% (Bennani and Alami 2006)</td>
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<tr>
<td>Qatar</td>
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<td></td>
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<td>5.6% [UNAIDS 2006]</td>
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<td>7.2% (Sudan National AIDS Control Program 1999)</td>
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<tr>
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<td>4.9% (settled population; El-Sony et al. 2002)</td>
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<tr>
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<tr>
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<td>1.85% (SNAP and UNAIDS 2006)</td>
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<td></td>
<td>4.8% (Southern Sudan origin; El-Sony et al. 2002)</td>
</tr>
<tr>
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<td>0.0% (Red Sea; North Sudan; Sudan National AIDS Control Program 2005)</td>
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<tr>
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<td>3.0% (Algadari; North Sudan; Sudan National AIDS Control Program 2005)</td>
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<td>1.6% (White Nile; North Sudan; Sudan Government of National Unity 2007)</td>
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### Table D.2 (Continued)

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<th>Country</th>
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<td>0.33% (Kassala; North Sudan; SNAP and UNAIDS 2006)</td>
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<td>2.8% (Khartoum; North Sudan; Sudan National AIDS Control Program 2005)</td>
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<td>1.89%–5.65% (four Khartoum sites; North Sudan; SNAP and UNAIDS 2006)</td>
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### Table D.3 Point-Prevalence Surveys on Different Population Groups

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<tr>
<th>Country</th>
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<th>Female sex workers</th>
<th>STI clinic patients</th>
<th>Tuberculosis patients</th>
<th>Pregnant women</th>
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<tr>
<td>Djibouti‡</td>
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(continued)
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<tr>
<th>Country</th>
<th>Injecting drug users</th>
<th>Men who have sex with men</th>
<th>Female sex workers</th>
<th>STI clinic patients</th>
<th>Tuberculosis patients</th>
<th>Pregnant women</th>
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(continued)
### Table D.3 (Continued)

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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.

⁵ WHO, UNICEF, and UNAIDS 2006b.
⁷ WHO, UNICEF, and UNAIDS 2006d.
⁸ WHO, UNICEF, and UNAIDS 2006e.
⁴⁰ WHO, UNICEF, and UNAIDS 2006g.
⁴¹ WHO, UNICEF, and UNAIDS 2006h.
⁴² WHO, UNICEF, and UNAIDS 2006i.

### Table D.4 Hepatitis C Virus Prevalence in Different Population Groups

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<td>0.3% (blood donors; Dupire et al. 1999)</td>
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<td>0.63% (pregnant women; Aïdaoui, Bouzid, and Laouar 2008)</td>
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<td>40.0% (children with hemolytic anemias; Al-Mahroos and Ebrahim 1995)</td>
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<td>22.1% (army recruits; Abdel-Wahab et al. 1994)</td>
<td>14.3% (tourism workers; El-Sayed et al. 1996)</td>
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<tr>
<td>31.4% (prisoners; Quinti et al. 1995)</td>
<td>7.7% (health care workers; El Gohary et al. 1995)</td>
</tr>
<tr>
<td>1.4% (dentists; Hindy, Abdelhaleem, and Aly 1995)</td>
<td>63.0% (IDUs; Saleh et al. 2000; El-Ghazzawi 1995)</td>
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<tr>
<td>5.3% (STD patients; Ali et al. 1998)</td>
<td>23.3% (kidney transplant recipients; Gheith et al. 2007)</td>
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<td>84.0% (hepatocellular carcinoma patients; Mabrouk 1997)</td>
<td>27.3% (acute jaundice patients; Quinti et al. 1997)</td>
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<td>73.5% (chronic liver disease patients; Waked et al. 1995)</td>
<td>46.2% (chronic liver disease patients; Abdel-Wahab et al. 1994)</td>
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<td>46.2% (hemodialysis patients; Abdel-Wahab et al. 1994)</td>
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<td>54.5% (hospitalized and multitransfused children; Abdel-Wahab et al. 1994)</td>
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<td>75.6% (thalassemic children; El Gohary et al. 1995)</td>
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<td>14.0% (family members of HCV positive patients; spouses; Madwar et al. 1999)</td>
<td>0.0% (family members of HCV positive patients; children; Madwar et al. 1999)</td>
</tr>
<tr>
<td>5–50% (various populations; Mohamed et al. 1996b)</td>
<td>(continued)</td>
</tr>
<tr>
<td>Country</td>
<td>Hepatitis C virus prevalence in different population groups</td>
</tr>
<tr>
<td>---------</td>
<td>------------------------------------------------------------</td>
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<tr>
<td>Iran, Islamic Republic of</td>
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<td>0.59% (blood donors; Karimi and Ghavanini 2001; Ghavanini and Sabri 2000)</td>
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<td>0.3% (blood donors; Rezvan et al. 1994)</td>
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<tr>
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<td>0.1% (blood donors; Rahbar, Rooholamini, and Khoshnoode 2004)</td>
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<td></td>
<td>0.4% (blood donors; Poursams et al. 2005)</td>
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<tr>
<td></td>
<td>0.4% (blood donors; Taziki and Espahbodi 2008)</td>
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<tr>
<td></td>
<td>0.8% (blood donors; Taziki and Espahbodi 2008)</td>
</tr>
<tr>
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<td>2.07% (blood donors; Khedmat et al. 2007)</td>
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<tr>
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<td>12.3% (adult population; Gholamreza et al. 2007)</td>
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<tr>
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<td>52.0% (IDUs; Zamani et al. 2007)</td>
</tr>
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<td>59.4% (IDUs; Rahbar, Rooholamini, and Khoshnoode 2004)</td>
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<tr>
<td></td>
<td>78.0% (IDUs; local prison; Nassirimanesh 2002)</td>
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<td>47.4% (IDUs; Khani and Vakili 2003)</td>
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<td>45.3% (IDUs; Zali et al. 2001)</td>
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<td>35.8% (prisoners; Javadi, Avijgan, and Hafizi 2006)</td>
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<td>2.9% (hemodialysis patients; Khamispoor and Tahmasebi 1999)</td>
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<td>13.2% (hemodialysis patients; Mohammad et al. 2003)</td>
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<td>24.8% (hemodialysis patients; Amiri, Shakib, and Toorchi 2005)</td>
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<td>55.9% (hemodialysis patients; Ansar and Kooloobandi 2002)</td>
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<td>43.4% (hemophiliac patients; Samimi-Rad and Shahbazi 2007)</td>
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<td>15.66% (hemophiliac patients; Karimi and Ghavanini 2001)</td>
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<td>24.2% (thalassemia patients; Alavian, Gholami and Masarrat 2002)</td>
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<td>9.4% (thalassemia patients; Javadzadeh, Attar, and Taher Yavari 2006)</td>
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<td>13.0% (thalassemia patients; Khamispoor and Tahmasebi 1999)</td>
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<td>27.2% (thalassemia patients; Kadivar et al., 2001)</td>
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<td>23.0% (thalassemia patients; Basiratnia, HosseiniAsl, and Avijegan 1999)</td>
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<td>25.0% (thalassemia patients; Jafroodi and Asadi 2006)</td>
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<tr>
<td></td>
<td>21.0% (thalassemia patients; Rezvan, Abolghassemi, and Kafiabad 2007)</td>
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<tr>
<td>Country</td>
<td>Hepatitis C virus prevalence in different population groups</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
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<tr>
<td>Iraq</td>
<td>63.8% (thalassemia patients; Ansar and Kooloobandi 2002)</td>
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<td>Jordan</td>
<td>66.0% (HIV-infected hemophilia patients; Al-Kubaisy, Al-Naib, and Habib 2006a)</td>
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<td>Kuwait</td>
<td>33.0% (thalassemia patients; Al-Fuzae, Aboolbacker, and Al-Saleh 1998)</td>
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<td>Lebanon</td>
<td>0.7% (blood donors; Araj et al. 1995)</td>
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<td>Libya</td>
<td>1.19% (national survey; Libya National Center for the Prevention of and Control of Infectious Diseases 2005)</td>
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<tr>
<td>Morocco</td>
<td>1.0% (pregnant women; Benjelloun et al. 1996)</td>
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<tr>
<td>Oman</td>
<td>0.9% (blood donors; Al-Dhahry et al. 1993)</td>
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<tr>
<td>Pakistan</td>
<td>1.70% (youth; Butt and Amin 2008)</td>
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<td>4.0% (blood donors; Khattak et al. 2002)</td>
</tr>
<tr>
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<td>0.5% (blood donors; Abdul Mujeeb, Aamir, and Mehmood 2000)</td>
</tr>
<tr>
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<td>3.01%–4.99% (blood donors; Sultan, Mehmood, and Mahmood 2007)</td>
</tr>
<tr>
<td></td>
<td>1.8% (blood donors; Khattak et al. 2004)</td>
</tr>
<tr>
<td></td>
<td>7.5% (blood donors; Mujeeb and Pearce 2008)</td>
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</table>
### Table D.4 (Continued)

<table>
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<tr>
<th>Country</th>
<th>Hepatitis C virus prevalence in different population groups</th>
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<tr>
<td></td>
<td>5.31% (general population; Khokhar, Gill, and Malik 2004)</td>
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<td>15.9% (general population; Aslam and Aslam 2001)</td>
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<td>4.6% (general population; Aslam et al. 2005)</td>
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<tr>
<td></td>
<td>33.7% (general population; rural area; Abbas et al. 2008)</td>
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<tr>
<td></td>
<td>5.4% (general population; weighted average in a review; Ali et al. 2009)</td>
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<tr>
<td></td>
<td>1.3% (children; Parker, Khan, and Cubitt 1999)</td>
</tr>
<tr>
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<td>1.6 % (children; Jafri et al. 2006)</td>
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<td></td>
<td>0.44% (children; Agboatwalla et al. 1994)</td>
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<tr>
<td></td>
<td>1.3% (children with HCV positive mothers; Parker, Khan, and Cubitt 1999),</td>
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<tr>
<td></td>
<td>2.1% (children; weighted average in a review; Ali et al. 2009)</td>
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<tr>
<td></td>
<td>21.0% (vaccinated population for smallpox; Aslam et al. 2005)</td>
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<td>5.6% (health care workers; Aziz et al. 2002)</td>
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<tr>
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<td>5.5% (health care workers; weighted average in a review; Ali et al. 2009)</td>
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<tr>
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<td>3.12% (hospital attendees; Khan et al. 2007)</td>
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<tr>
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<td>31.0% (operation room personnel; Mujeeb, Khatri, and Khanani 1998)</td>
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<td>88.0% (IDUs; Kuo et al. 2006)</td>
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<td>89.0% (IDUs; United Nations Office for Drug Control and Crime Prevention and UNAIDS 1999)</td>
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<td>60.0% (IDUs; Achakzai, Kassi, and Kasi 2007)</td>
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<td></td>
<td>87.0% (IDUs; Pakistan National AIDS Control Program 2005b)</td>
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<tr>
<td></td>
<td>91.0% (IDUs; Pakistan National AIDS Control Program 2005b)</td>
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<tr>
<td></td>
<td>22.0% (noninjecting drug users; Kuo et al. 2006)</td>
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<td>20.5% (household contacts of HCV positivethalassemic children; Akhtar et al. 2002)</td>
</tr>
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<td>36.0% (type II diabetes patients; Ali et al. 2007)</td>
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<td>44.0% (patients who received frequent injections; Khan et al. 2000)</td>
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<td>33.0% (hepatocellular carcinoma cases; Abdul Mujeeb et al. 1997)</td>
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<td>60.0% (thalassemia patients; Bhatti, Amin, and Saleem 1995)</td>
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<td>34.8% (children with thalassemia; Akhtar and Moatter 2004)</td>
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<td>88.0% (hemodialysis patients; Gul and Iqbal 2003)</td>
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<td>23.7%–68.0% (hemodialysis patients; range in a review; Raja and Janjua 2008)</td>
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<td>Saudi Arabia</td>
<td>4.3% (blood donors; Mahaba, el-Tayeb Ael, and Elbaz 1999)</td>
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<td>0.59% (blood donors; Bashawri et al. 2004)</td>
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<td>0.4% (blood donors; El-Hazmi 2004)</td>
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<td></td>
<td>1.7% (blood donors; Abdelaal et al. 1994)</td>
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<td></td>
<td>1.1% (blood donors; Shobokshi et al. 2003)</td>
</tr>
<tr>
<td></td>
<td>3.6% (general population; males; Al Nasser 1992)</td>
</tr>
<tr>
<td></td>
<td>3.1% (general population; females; Al Nasser 1992)</td>
</tr>
<tr>
<td></td>
<td>1.7% (general population; males; Njoh and Zimmo 1997)</td>
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<td>3.2% (general population; non-Saudi persons; Njoh and Zimmo 1997)</td>
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<td>1.0% (children; Bakir et al. 1995)</td>
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<tr>
<td></td>
<td>0.7% (pregnant women; Shobokshi et al. 2003)</td>
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<td></td>
<td>2.2% (health care workers; Khan, Alkhalife, and Fathalla 2004)</td>
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<td>5.09% (different population groups; Mahaba, el-Tayeb Ael, and Elbaz 1999)</td>
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<td></td>
<td>74.6% (IDUs; Njoh and Zimmo 1997)</td>
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<td>10.5% (non-IDU drug dependent patients; Njoh and Zimmo 1997)</td>
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<td>5.87% (patients attending outpatient clinics; Saudis; Fakeeh and Zaki 1999)</td>
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<td>22.54% (patients attending outpatient clinics; Egyptians; Fakeeh and Zaki 1999)</td>
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<td>41.9% (hemodialysis patients; Ayoola et al. 1991)</td>
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<td>9.24% (hemodialysis patients; including Bahraini patients; Qadi et al. 2004)</td>
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<tr>
<td>Country</td>
<td>Hepatitis C virus prevalence in different population groups</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------</td>
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<tr>
<td><strong>15%–80%</strong></td>
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<td>55.7%</td>
<td>(hemodialysis patients; Shobokshi et al. 2003)</td>
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<td>(hemodialysis patients; Saxena and Panhotra 2004)</td>
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<td>17.9%</td>
<td>(schistosomiasis patients; Khan, Alkhali, and Fathalla 2004)</td>
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<td>21.0%</td>
<td>(non-Hodgkin’s lymphoma patients; Harakati, Abualkhair, and Al-Knawy 2000)</td>
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<td>(children; Aceti et al. 1993)</td>
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<td>(hospitalized persons; Aceti et al. 1993)</td>
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<td>(an area with a high prevalence of schistosomiasis; Mudawi et al. 2007)</td>
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<td>Syrian Arab Republic</td>
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<td>(IDUs; Othman and Monem 2002)</td>
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<td>(health care workers; Othman and Monem 2001)</td>
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<td>(laboratory workers; Othman and Monem 2001)</td>
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<td>(hemodialysis patients; Moukeh et al. 2009)</td>
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<tr>
<td>0.71%</td>
<td>(general population; Gorgi et al. 1998)</td>
</tr>
<tr>
<td>0.4%</td>
<td>(general population; Triki et al. 1997)</td>
</tr>
<tr>
<td>39.7%</td>
<td>(HIV patients; Kilani et al. 2007)</td>
</tr>
<tr>
<td>20.0%</td>
<td>(hemodialysis patients; Hmaied et al. 2006)</td>
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<td>45.10%</td>
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<td>42%</td>
<td>(hemodialysis patients; Hachicha et al. 1995)</td>
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<td>42.0%</td>
<td>(hemodialysis patients; Jemni et al. 1994)</td>
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<td>50.0%</td>
<td>(hemophiliacs; Langar et al. 2005)</td>
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<td>50.5%</td>
<td>(hemophiliacs; Djebbi et al. 2008)</td>
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<td>Turkey</td>
<td>0.4% (blood donors; Orsoy et al. 2003)</td>
</tr>
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<td>0.38%</td>
<td>(blood donors; Gurol et al. 2006)</td>
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<td>0.19%</td>
<td>(blood donors; Sakarya et al. 2004)</td>
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<td>0.45%</td>
<td>(blood donors; Altindis et al. 2006)</td>
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<td>0.37% (blood donors; Mutlu, Meric, and Willke 2004)</td>
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<td>0.39% (blood donors; Afsar et al. 2008)</td>
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<td>0.28% (blood donors; Afsar et al. 2008)</td>
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<td>0.37% (blood donors; Afsar et al. 2008)</td>
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<tr>
<td></td>
<td>1.0% (rural areas; general population; Akcam et al. 2009)</td>
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<tr>
<td></td>
<td>2.3% (general population; men; Bozkurt et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>2.0% (general population; women; Bozkurt et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>2.1% (general population; Yildirim et al. 2009)</td>
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<tr>
<td></td>
<td>0.6% (general population; Alim et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>0.1% (engaged couples; Alim et al. 2009)</td>
</tr>
<tr>
<td></td>
<td>1.3% (study controls; Gulcan et al. 2008)</td>
</tr>
<tr>
<td></td>
<td>2.8% (barbers; Candan et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>0.56% (soldiers; Altindis et al. 2006)</td>
</tr>
<tr>
<td></td>
<td>0.45% (soldiers; Altindis et al. 2006)</td>
</tr>
<tr>
<td></td>
<td>1.5% (health personnel; Koksal et al. 1991)</td>
</tr>
<tr>
<td></td>
<td>0.3% (health care workers; Ozsoy et al. 2003)</td>
</tr>
<tr>
<td></td>
<td>2.0% (spouses of chronic HCV patients; Tahan et al. 2005)</td>
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<td></td>
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<td>0.9% (gynecology and obstetrics patients; Tekay and Dzhek 2006)</td>
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<td>2.2% (outpatients; Demirturk et al. 2006)</td>
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<td>7.0% (predialytic chronic kidney disease patients; Sit et al. 2007)</td>
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<td>26.0% (hemodialysis patients; Selcuk et al. 2006)</td>
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<td>12.7% (hemodialysis patients; Ocak et al. 2006)</td>
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<td>43.6% (hemodialysis patients; Bozdayi et al. 2002)</td>
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<td>5.8% (children with cancer; Kocabas et al. 1997a)</td>
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<td>2.0% at diagnosis and 14.0% at the end of cancer therapy (children with cancer; Kebudi et al. 2000)</td>
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<td>Yemen, Republic of</td>
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<td>2.1% (healthy persons; El Guneid et al. 1993)</td>
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<tr>
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<td>4.2% (healthy persons; Al-Moslih and Al-Huraibi 2001)</td>
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<tr>
<td></td>
<td>0.5% (health care workers; Haidar 2002)</td>
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<td>3.5% (health care workers; Shidrawi et al. 2004)</td>
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<td></td>
<td>37.1% (patients with liver disease; Al-Moslih and Al-Huraibi 2001)</td>
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<td>21.5% (patients with liver disease; El Guneid et al. 1993)</td>
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Note: ANC = antenatal clinic; FSW = female sex worker; IDU = injecting drug user; STD = sexually transmitted disease.
Table E.1 Levels of HIV/AIDS Basic Knowledge in Different Population Groups

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<th>Country</th>
<th>High basic knowledge</th>
<th>Low basic knowledge</th>
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<tr>
<td>Afghanistan</td>
<td>University students (Mansoor et al. 2008)</td>
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<td>General population women (van Egmond et al. 2004)</td>
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<td>Intrapartum patients (Todd et al. 2009)</td>
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<td>TB patients (Todd et al. 2007)</td>
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<td>High-risk groups (Action Aid Afghanistan 2006)</td>
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</tr>
<tr>
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<td></td>
<td>FSWs (Action Aid Afghanistan 2006)</td>
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<td>Street children (Egypt MOH and Population National AIDS Program 2006)</td>
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<td>Squatter populations (Shama, Fiala, and Abbas 2002)</td>
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<td>General population women (NEJM 2008)</td>
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<td>Ever-married women (Measure DHS 2006)</td>
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<td>General population (Kabbash et al. 2007)</td>
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<td>Drug users (Salama et al. 1998)</td>
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<td>IDUs (Egypt MOH and Population National AIDS Program 2006)</td>
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<td>FSWs (Egypt MOH and Population National AIDS Program 2006)</td>
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<td>MSM (Egypt MOH and Population National AIDS Program 2006)</td>
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<td>Adolescents (Yazdi et al. 2006)</td>
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<td>General population (Montazeri 2005)</td>
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<td>Truck drivers (Tehrani and Malek-Afzalip 2008)</td>
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<td>Teachers (Mazloomy and Baghianimoghadam 2008)</td>
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<td>Runaways and other women seeking safe haven (Hajiabdolbaghi et al. 2007)</td>
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<td>Prisoners (Nakhaee 2002)</td>
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<td>FSWs (Tehrani and Malek-Afzalip 2008)</td>
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<td>MSM (Eftekhar et al. 2008)</td>
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<td>Kuwait</td>
<td>Different populations (Al-Owaish et al. 1999)</td>
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### Table E.1 (Continued)

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<th>Country</th>
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<td>IDUs (Aara [unknown]; Hermez et al. [unknown])</td>
<td>IDUs (Mishwar 2008)</td>
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<td>FSWs (Mishwar 2008)</td>
<td>FSWs Hermez et al. [unknown]</td>
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<td>FSWs (Rady 2005)</td>
<td>MSM (Mishwar 2008)</td>
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<td>MSM (Hermez et al. [unknown]; Dewachi 2001)</td>
<td>MSM (Hermez et al. [unknown]; Dewachi 2001)</td>
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<td>Morocco</td>
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<td>General population women (Zidouh [unknown])</td>
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<td>Blood donors (Boutayeb, Aamoum, and Benchemsi 2006)</td>
<td>Blood donors (Boutayeb, Aamoum, and Benchemsi 2006)</td>
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<td>Oman</td>
<td>College students (Al-Jabri and Al-Abri 2003)</td>
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<td>Rural adolescents (Raheel et al. 2007)</td>
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<td>School students (Shaikh and Assad 2001)</td>
<td>Paramedics ( Siddiqi, Majeed, and Saeed Khan 1995)</td>
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<td>Private health practitioners (Khan 1995)</td>
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<td>Migrant workers (Faisal and Cleland 2006)</td>
<td>Fishermen (Sheikh et al. 2003)</td>
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<td>Male prisoners (Khwaja et al. 1997)</td>
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<td>IDUs (Pakistan National AIDS Control Program 2006–07)</td>
<td>IDUs (Haque et al. 2004)</td>
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<td>IDUs (Pakistan National AIDS Control Program 2008)</td>
<td>IDUs (Afghani refugees; Zafar et al. 2003)</td>
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<td>Clients of FSWs (Bokhari et al. 2007)</td>
<td>IDUs (Khwaja et al. 1997)</td>
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<td>Clients of MSWs (Bokhari et al. 2007)</td>
<td>Dancing girls, usually FSWs and their clients (Haroon 1994)</td>
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<td>HSWs (Pakistan National AIDS Control Program 2005a)</td>
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<td>HCWs (Mahfouz et al. 1995)</td>
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<td>Men in a management training institute (Badahdah 2005)</td>
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<td>High school students (Elzubier, el Nour, and Ansari 1996)</td>
<td>ANC women attendees (Ahmed 2004b)</td>
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<td>High school teachers and students (Elzubier, el Nour, and Ansari 1996)</td>
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<td>General population (Southern Sudan; NSNAC and UNAIDS 2006)</td>
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<td>Truck drivers (Farah and Hussein 2006)</td>
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(continued)
Characterizing the HIV/AIDS Epidemic in the Middle East and North Africa

Table E.1 (Continued)

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</table>

Note: ANC = antenatal clinic; FSW = female sex worker; HCW = health care worker; HSW = hijra 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

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<tr>
<th>Country</th>
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<tr>
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<tr>
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<tr>
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<td>Adolescents (El-Tawila et al. 1999)</td>
</tr>
<tr>
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<td>Students (Farghaly and Kamal 1991)</td>
</tr>
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<td></td>
<td>Teachers (Farghaly and Kamal 1991)</td>
</tr>
<tr>
<td></td>
<td>General population women (Measure DHS 2006)</td>
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<td>General population women (Measure DHS 2004)</td>
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<tr>
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<td>HCWs (Faris and Shouman 1994)</td>
</tr>
<tr>
<td></td>
<td>Physicians (Sallam et al. 1995)</td>
</tr>
<tr>
<td>Iran, Islamic Republic of</td>
<td>Youth (Tehrani and Malek-Afzalip 2008)</td>
</tr>
<tr>
<td></td>
<td>High school students (Tavoosi et al. 2004)</td>
</tr>
<tr>
<td></td>
<td>Dentists (Askarian, Mirzaei, and Cookson 2007)</td>
</tr>
<tr>
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<td>Truck drivers (Tehrani and Malek-Afzalip 2008)</td>
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<td>FSWs (Tehrani and Malek-Afzalip 2008)</td>
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<td>MSM (Eftekhari et al. 2008)</td>
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<td>Medical students (Shaikh et al. 2007)</td>
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<td>HCWs (Najmi 1998)</td>
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<td>IDUs (Khawaja et al. 1997)</td>
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<td>Country</td>
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<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------</td>
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<td>Street children (Ahmed 2004h)</td>
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<td>University students (Sudan National HIV/AIDS Control Program 2004)</td>
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<td>University students (Ahmed 2004i)</td>
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<td>ANC women attendees (Ahmed 2004b)</td>
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<td>Prisoners [Assal 2006]</td>
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<td>Truck drivers (Ahmed 2004k)</td>
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<td>TB patients (Ahmed 2004i)</td>
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<tr>
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<td>University students (Ganczak et al. 2007)</td>
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<td>Youth [Al-Serouri 2005]</td>
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<td>Returnee families from abroad (Busulwa 2003)</td>
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</table>

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

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<td>FSWs (Egypt MOH and Population National AIDS Program 2006)</td>
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<td></td>
<td>MSM (Egypt MOH and Population National AIDS Program 2006)</td>
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<td>Iran, Islamic Republic of</td>
<td>Adolescents (Mohammadi et al. 2006)</td>
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<td>Adolescents (Yazdi et al. 2006)</td>
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<td>Youth (Tehrani and Malek-Afzalip 2008)</td>
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<td>Teachers (Mazloom and Baghianimoghadam 2008)</td>
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<td>General population (Askarian, Mirzaei, and Assadian 2007)</td>
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<td>General population (Hedayati-Moghaddam 2009)</td>
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<td>College students (Al-Jabri and Al-Abri 2003)</td>
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<td>Adolescents (Ali, Bhatti, and Usijima 2004)</td>
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<td>Paramedical students (Al-Mazrou, Abouzeid, and Al-Jeffri 2005)</td>
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<td>Street children (Kudrati et al. 2002; Kudrati, Plummer, and Yousif 2008)</td>
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<td>High school students (Elzubier, el Nour, and Ansari 1996)</td>
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<td>University students (Ahmed 2004i)</td>
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<td>University students (Sudan National HIV/AIDS Control Program 2004)</td>
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<td>Teachers (Elzubier, el Nour, and Ansari 1996)</td>
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<td>ANC women attendees (Ahmed 2004b)</td>
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<td>General population (Southern Sudan) (NSNAC and UNAIDS 2006)</td>
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<td>Suspected PLHIV (Ahmed 2004a)</td>
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### Table E.3 (Continued)

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<th>Country</th>
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<td>FSWs (Ahmed 2004f)</td>
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<td>MSM (Elrashied 2006)</td>
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<td>FSWs (Syria National AIDS Programme 2004)</td>
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<td>IDUs (Syria Mental Health Directorate 2008)</td>
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<td>Tunisia</td>
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<td>Youth (Baybuga and Celik 2004)</td>
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<td>General population (Ayranci 2005)</td>
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<td>Drug users and nondrug users (Soskolne and Maayan 1998)</td>
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</table>

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

<table>
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<tr>
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<th>Positive attitudes toward people living with HIV/AIDS</th>
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<td>Industrial workers (El-Sayed, Kabbash, and El-Gueniedy 2008)</td>
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<td>General population (Montazeri 2005)</td>
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<td>PLHIV (Sherafat-Kazemzadeh et al. 2003)</td>
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(continued)
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<td>General population (Zidouh [unknown])</td>
<td>General population (WHO/EMRO 2000)</td>
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<td>FSWs (Yousif 2006)</td>
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<td>FSWs (Ahmed 2004f)</td>
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<td>General population (Southern Sudan; UNHCR 2007)</td>
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<td>General population (Ayranci 2005)</td>
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<td>University students (Ganczak et al. 2007)</td>
<td>University students (Sudan National HIV/AIDS Control Program 2004)</td>
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<th>Positive attitudes toward people living with HIV/AIDS</th>
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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

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Note: FSW = female sex worker; HCW = health care worker; IDU = injecting drug user; MSM = men who have sex with men.
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Characterizing the HIV/AIDS Epidemic in the Middle East and North Africa


Libya National Center for the Prevention of and Control of Infectious Diseases. 2005. “Results of the National Seroprevalence Survey.”


Ministry of Health and Medical Education of Iran. 2006. “Treatment and Medical Education.” Islamic Republic of Iran HIV/AIDS situation and response analysis.


Zidouh, A. Unknown. “VIH/SIDA et infections sexuellement transmissibles: connaissance et attitudes.”
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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.