Chapter 11
HIV and Sexual Health in MENA's Adolescents

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11.1 Introduction

Human immunodeficiency virus (HIV) is a virus that attacks immune cells, making a person more vulnerable to infections and cancers. If left untreated, HIV can lead to the *acquired immunodeficiency syndrome* (AIDS).

The global impact of the HIV and AIDS epidemic has spurred its rapid prioritization as one of the most pressing health issues facing the world community. Although the epidemiology and social forces affecting its continued proliferation differ between communities and regions, HIV continues to spread worldwide. There are approximately 38 million people living with HIV (PLHIV) globally in 2019 and more than 30 million who have died of AIDS-related causes since the beginning of the epidemic (UNAIDS 2020). Global efforts to control the epidemic have been beneficial, and significant progress has been made. For instance, the number of

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newly infected people, including children, and the number of AIDS-related deaths have significantly declined over the years. Moreover, the number of people receiving antiretroviral treatment (ART) increased to 25.4 million in 2019, up from 6.4 million in 2009 (UNAIDS 2020). Under Sustainable Development Goal 3, the global community has committed to end the AIDS epidemic by 2030. Under the "90-90-90" targets, countries work toward achieving, by 2020, "90% of people living with HIV knowing their HIV status; 90% of people who know their HIV-positive status on treatment; and 90% of people on treatment with suppressed viral loads" (United Nations 2015).

Hence, despite significant decrease in incidence, new infections still occur at a high rate, and PLHIV continue to face challenges managing their illness. This is particularly true in the Middle East and North Africa (MENA) region,[1] which witnessed a 22% increase in new infections between 2010 and 2019, despite trends of incidence reduction across all other regions of the world. With respect to the epidemic, countries of the MENA can be categorized into two main groups: countries with a generalized epidemic (i.e., Djibouti, South Sudan, and Somalia) and countries with a concentrated epidemic and low HIV prevalence in the general population (i.e., Lebanon and Egypt). The epidemic is however dynamically growing and still presenting a risk of rapid HIV spread in different pockets of the population (Mumtaz et al. 2020a, b). Moreover, this region has specific characteristics negatively impacting HIV. First, the young population (defined as 15–24 years old) constitutes one third of the regional population (United Nations 2017). Second, at least eight of the MENA countries were classified as being conflict-affected in 2018 (Djibouti, Iraq, Lebanon, Libya, the State of Palestine, Sudan, Syria, Yemen) (The World Bank 2018). Third, the unstable political situation has resulted in millions of mobile or displaced populations, including migrants who might be challenged by risky behavior and might face limited access to health services (the number of international migrants in the MENA surged from 18 million in 2000 to 41 million in 2017 (DESA, U. 2017)). Moreover, the traditionally conservative sexual mores and religious adherence may have played an active role in dissuading populations from engaging in risky behaviors but are waning today.

In addition, there is a growing concern surrounding the potential impact of the coronavirus disease 2019 (COVID-19) pandemic on the HIV response in the MENA, including the availability of ART and access to preventive services. As of October 14, 2020, the region had reported a total of 2,660,450 COVID-19 cases (7% of the global count) with 67,750 deaths (World Health Organization 2020). Disruptions in provision of regular HIV/AIDS services are estimated to result in many more additional deaths (UNAIDS 2020; Jiang et al. 2020).

The purpose of this chapter is to overview the HIV situation among adolescents in the MENA region in terms of the general epidemiology, burden, modes of transmission, preventive and diagnostic tools, management plan, and challenges.

[1] According to UNAIDS: Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordon, Kuwait, Lebanon, Libya, Morocco, Occupied Palestinian Territory, Oman, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates, and Yemen.

We therefore conducted an extensive review of literature articles and other reports from the MENA to include them in our analysis. Our chapter will also discuss some other HIV-related issues from the wider angle of teenagers' sexual health.

11.2 Epidemiology and Burden of HIV and STIs in Adolescents in the MENA

By the end of 2019, there were approximately 240,000 PLHIV in the MENA, including 9600 children aged 0–14 (UNAIDS 2020). The region counted 8000 adult and child deaths due to AIDS. The number of new HIV infections increased by 22% in 2019 compared to 2010, whereas AIDS-related deaths decreased by only 2% in 2019 compared to 2010. The percent of PLHIV aware of their status in 2019 was 52%. PLHIV who were on ART reached 38% and PLHIV who were virally suppressed reached 32%.

In the MENA, with the exception of Djibouti, Somalia, and South Sudan, HIV prevalence among the general population is well below 1% (Mumtaz et al. 2020a, b). However, 97% of the new infections are affecting key populations: people who inject drugs (PWID), men who have sex with men (MSM), and female sex workers (FSW) (Mumtaz et al. 2020a, b). Among PWID, there are registered HIV epidemics in Libya (40.7%), Iran (9.4%), and Pakistan (8%) and possibly emerging epidemics in Egypt and Afghanistan. Among MSM, Iran (14.8%), Lebanon (12.3%), Tunisia (10.1%), Sudan (7.8%), Pakistan (7.5%), Egypt (6.2%), Yemen (5.9%), and Morocco (4.9%) have registered concentrated epidemics. Among FSW, there are concentrated epidemics in South of Sudan (37.9%), Libya (15.7%), Sudan (7.7%), Somalia (5.2%), and Morocco (5.1%) (UNAIDS 2020).

According to UNAIDS, there are 6300 adolescents (aged 10–19) living with HIV in the MENA (increase of 28% compared with adolescents living with HIV in 2010). However, the number of new HIV infections across this age category is constantly <1000 per year.

Mother-to-child transmission (MTCT) is defined as the transmission of HIV from an HIV-positive mother to her child during pregnancy, labor, delivery, or breastfeeding. In the absence of any intervention (ART), transmission rates range from 15% to 45%. This rate can be reduced to below 5% with effective ART, leading to undetectable viral loads in the maternal circulation. The MENA has an alarming rate of MTCT of 30%, the highest among all regions, reaching almost three times the global rate (11%). This can be explained by the lack of access to ART, since only 29% of pregnant women needing ART in 2019 were actually able to receive it.

Data on sexually transmitted infections (STIs) are scarce, and available data is often lacking granular age disaggregation. The limited available data, however, reveals that STIs are more common among young people than among other age groups.

A 2007 study among married women in Oman found that age was the most important risk factor for STIs. Women under age 25 were twice as likely to have an STI compared to women who were 25 and older (DeJong et al. 2007). Consistently, a study from Lebanon among gay and bisexual men showed in 2019 that the mean age of the first sexual experience among participants was 16.5 (Maatouk et al. 2019).

Thus, these scarce findings should set an agenda to further explore STIs among adolescents in the MENA and to further determine their prevalence among general and key populations, especially that the first sexual contacts appear to happen during adolescence.

11.3 HIV Prevention and Diagnostic Tools

Effective prevention in the MENA depends on reaching and engaging with key populations. For instance, Lebanon, Iran, and Morocco have expanded opioid substitution therapy (OST) programs at the levels of communities and prisons. Consequently, the three countries have reported access to sterile injecting equipment by more than 70% of people who inject drugs. These countries serve as an example where access to OST and sterile injecting equipment was rapidly scaled up in major urban centers and can be helpful for implementation in prevalent countries such as Algeria, Egypt, Lebanon, and Tunisia (UNAIDS 2015).

In relation with MSM programs, Lebanon is an example of success, with 75% of MSM in Beirut reporting both knowledge of their HIV status and condom use. In fact, such programs can be successful when rights, privacy, and dignities of beneficiaries are respected and when the civil society and the key affected communities are implicated in the response to ensure efficient service delivery. Morocco and Tunisia are on the same way, but testing coverage and condom use were still below 50% in 2015. Consistently, pre-exposure prophylaxis usage by MSM communities in Algeria, Iran, Lebanon, and Morocco is still in the first steps of implementation.

In 2018, two new policies were recommended by the WHO: HIV self-test (HIVST) and partner notification (PN) (WHO 2016).

- HIVST is an example of a self-care intervention that recognizes individuals as active agents in managing their own health, including disease prevention, self-medication, and providing care to dependent persons. Vulnerable populations such as MSM and refugees or migrants may avoid the health system due to stigma from providers or difficulties in access to health services. Thus, HIVST aims at scaling up HIV testing. Moreover, since the beginning of the COVID-19 pandemic and the consequent lockdown, more consideration was given to HIVST, since it became the only possible diagnostic tool that can easily be used by people who wished to get tested (Maatouk et al. 2020a, b, c).
- PN services need special attention along with a multidimensional support system from health, psychological, religious, social, and legal perspectives. Although existing evidence supports its safety, implementing PN services in the MENA

requires careful planning. This should take into consideration the nature of the target populations, their environment, and sociocultural beliefs in order to address the beneficiaries' concerns, improve acceptance, maximize uptake, and safeguard from adverse consequences. A crucial role can be played by civil society organizations which have the potential to reach greater numbers of people particularly those unlikely to go to a facility for testing. Partners can also be reached using new approaches like HIVST (Maatouk et al. 2019).

Regarding other communities, such as women engaged in transactional sex and FSW, several countries reported success through high rates of condom use among these key populations: Algeria and Lebanon (>80%) and Djibouti, Iran, Jordan, Morocco, and Tunisia (50–80%). Taking into consideration that these communities are hard to reach, condom use results are understandably hard to achieve. In fact, the low access to HIV testing among these groups (compared to HIV testing access among MSM) is another indicator of the difficulty to reach these populations by prevention programs. It is true that in Lebanon, this coverage is considered good; however in Algeria, Morocco, Tunisia, and Iran, the respective figures are less than 33%. Effective prevention intervention should be based on rights and stigma-free to be able to reverse the trajectory of new infections in these communities.

It is true that ART coverage in the MENA is the lowest in the world; however, testing coverage along with ART coverage is rapidly improving in the region. Innovative approaches were recommended and implemented to achieve these targets, such as reducing the time spent on counseling, HIVST, mobile testing services and outreach, and provision of testing services by lay-providers.

Stigma-free civil organizations available in Lebanon, Jordan, and Morocco among other countries serve as an example of good practice of free, voluntary, and confidential testing service. HIVST was introduced in many MENA countries and aims at scaling up testing and reaching those who do not test.

11.4 Factors Contributing to HIV Risk for MENA Young People

11.4.1 Vulnerable and Most at-Risk Young People

Young people in general are considered vulnerable. Among them, special subgroups are considered even more vulnerable and include young refugees/migrants, young people with disability, adolescent girls and early-married girls, unemployed young people, and young people with low socioeconomic status. But the most vulnerable population (at the highest risk of HIV) is attributed to young PLHIV, PWID, sex workers, and MSM.

Poverty particularly puts some communities at great risk of contracting HIV. For instance, street children (boys and girls) might be obliged to sell sex amid a setting where access to condom might probably be low. Several reports shed the light on

this increasing cohort in the MENA region, particularly among homeless MSM (Abu-Raddad et al. 2010). In Egypt, 65.8% of homeless MSM had their first same-sex encounter before the age of 15 (El Sayyed et al. 2008). Consistently, a study from Lebanon among gay and bisexual men showed in 2019 that the mean age of the first sexual experience among participants was 16.5 (Maatouk et al. 2019). Other studies have also shown that MSM have women partners as well. For instance, a study among MSM from Libya reported that 40% of respondents had sex with both men and women (Valadez et al. 2013). A survey in Morocco among MSM found similar results (Johnston et al. 2013).

Commercial sex work can also have a negative impact on young people at risk of HIV. This is particularly secondary to the high number of partners and the low condom use. It is worth mentioning that commercial sex work is not exclusive to FSW in the MENA but also exists among MSM (Morocco and Somalia) (IOM 2012; Johnston et al. 2013).

While there are few studies about condom use among key populations in the MENA, surveyed communities show an overall inconsistent use of condoms. For instance, among Sudanese FSW surveyed, 30.3% reported condom use at last sex (Elhadi et al. 2013). This is consistently coupled with a low knowledge about HIV (Elhadi et al. 2013; Maatouk et al. 2019). Other contributing factors include risky behaviors and limited access to services (Navadeh et al. 2013).

11.4.2 Lack of Sexual and Reproductive Health Education

The absence of accessible, adequate, and effective sexual and reproductive health education in MENA schools is one of the major gaps that puts young people at risk of contracting HIV.

In 2016, a study of students from 17 universities across Lebanon revealed a low percentage of condom use (36.3%) (Salameh et al. 2016). A very recent study by Maatouk et al. in 2020 showed that females tend to lack self-efficacy in relation to sexual behavior, to be coerced into behaviors they do not desire, and to engage in STI screening less frequently, while men appear to use substances more frequently, which could lead to poor outcomes. Furthermore, on the whole, heterosexual students engage less frequently with sexual health screening than non-heterosexual students.

Many health education interventions assessing medical students' HIV knowledge and attitudes found a positive impact in decreasing stigma and discriminatory attitudes toward PLHIV post-intervention. These studies were conducted in Egypt (El-Nawawy 2008), Libya (Sugathan and Swaysi 2012), the UAE (Barss et al. 2009), and Yemen (Badahdah and Sayem 2010). Thus, sustained educational programs can only have a greater positive impact on access to key HIV services.

According to a systematic review, the overall basic HIV knowledge was high among key populations at higher risk of infection and bridging and general population groups (Mumtaz et al. 2020a, b). However, few population pockets still had low

basic knowledge. The level of comprehensive knowledge was overall low, and misinformation and misconceptions were prevalent. At-risk communities such as PWID, MSM, and FSW were unaware of some modes of HIV transmission. Perception of risk of infection was low even among these at-risk communities. Differentials in knowledge were raised putting women, rural populations, refugees, and other marginalized minorities at a disadvantage. Attitudes toward PLHIV tended to be negative.

11.4.3 Conflict, Economic Downturn, and Migration

Conflict and economic downturn lead to decreased HIV services, lack of funds to offer testing and prevention services, lack of sustainability of services, deprioritization of sexual health, and delayed marriages coupled with stress-induced risky behaviors. In addition, unemployment lead to more spare time for young people to socialize, which possibly exposes them to risky behaviors.

Migration and displacement, which happens in the MENA for several political and economic reasons, plays a crucial role in the spread of HIV. The populations affected by migration or displacement definitely include young people (Abu-Raddad et al. 2010). These communities are usually marginalized and lack access to services. Moreover, the increase in sex work for financial purposes makes these communities even more vulnerable to HIV.

11.4.4 Gender Disparity

MENA still ranks in the bottom 20% of the global health gender gap and continues to rank last on the overall gender gap index, behind South Asia (The Global Gender Gap Report 2017).

According to Madani (2018), women are particularly susceptible to the HIV infection. Not only are women more biologically prone to acquiring the infection, but endemic interpersonal violence against women and girls, misogynistic traditions, lack of control over condom use, and limited sex education reinforce unequal power dynamics between men and women. Repeatedly, studies on notified cases have indicated that the vast majority of women who acquire HIV acquire it from their husbands (Abu-Raddad et al. 2010; Mumtaz et al. 2020a, b).

11.4.5 Risky Behaviors

This section will focus on risky behaviors that are specific to some key populations such as PWID, MSM, and FSW.

Sharing of non-sterile needles and/or syringes is one of the key risky behaviors that expose PWID to HIV infection. An average of 42% of people who inject drugs in MENA ever shared needles/syringes, while 24% did so in the last injection (Mumtaz et al. 2020a, b).

Having multiple, including concurrent, sexual partners are reported by over 90% of MSM in the MENA with an average of 4–14 sexual partners in the last 6 months (Mumtaz et al. 2020a, b). Male sex work also appears to be common, with 20–76% of MSM reporting ever exchanging sex for money (Mumtaz et al. 2020a, b). Overall, the rate of consistent condom use is below 25% (Mumtaz et al. 2020a, b).

According to Mumtaz et al. (2020a, b), the mean number of clients of FSW in the past month is in the range of 4.4–114 with a median of 34 clients. Consistent condom use is reported by about a third of all FSW.

11.4.6 Lack of Effective Surveillance

Besides the repercussions of political instability on surveillance and reporting, the MENA region is traditionally conservative. This confluence of sociopolitical realities presents serious challenges to effectively assessing HIV prevalence among young populations of the region (Shawky et al. 2009). While a second-generation surveillance has been recommended, the majority of MENA countries rely on passive reporting—with active reporting only in place for pregnant women at antenatal clinics (Shawky et al. 2009). This is also true for non-HIV STIs, such as *Neisseria gonorrhea* (Maatouk and Assi 2020).

11.4.7 Lack of Research

The absence of research on risky behavior among young people further contributes to the incomplete baseline of knowledge on HIV/AIDS proliferation factors. Numerous studies exist on MENA young peoples' knowledge of and attitude toward HIV; however, few of them ask behavioral questions. Maatouk et al. (2020a, b, c) reported that Lebanese MSM (n = 1364) who engage in riskier behaviors and who appraise their risk to be high are more likely to get tested for HIV/STIs. Aside from reports usually collected in university hospital settings, it is not expected to have official studies about young people's sexual behavior because this may be perceived as an approval or legitimacy of these behaviors. The truth is the majority of MENA countries stigmatize and criminalize some of these behaviors. This results in the avoidance of collecting such information.

11.5 Conclusions

Many factors in the MENA contribute to the spread of HIV among young populations. Youth bulge, increased globalization, ongoing conflict, mass migration, and continued conservative approach to sex and reproductive health education and service access should all be addressed to limit the spread of HIV among MENA's young people. COVID-19 is one of the new challenges added to the already exhausted health systems. The continued efforts to sustain HIV prevention, care, and treatment to all populations in need keep alive the promise of an HIV-free generation and a healthy future for a MENA region still coping with HIV challenges.

Critical Questions

1. What are the missed opportunities for the Middle East and North Africa region to achieve its HIV goals, especially in the young populations?
2. Which factors contribute to HIV risk for MENA young people?
3. Which behaviors are considered at risk?
4. How does COVID-19 contribute to the existing challenges in the regional HIV situation?
5. How to overcome COVID-19 challenges in HIV response?

References

Abu-Raddad, L.J., Ayodeji Akala, F., Semini, I. Riedner, G. Wilson D., & Tawil, O., 2010. Characterizing the HIV/AIDS Epidemic in the Middle East and North Africa: Time for Strategic Action. The World Bank.

Badahdah AM, Sayem N, 2010. HIV-related knowledge and AIDS stigma among college students in Yemen. EMHJ-Eastern Mediterranean Health Journal, 16 (8), 901–906.

Barss P, Grivna M, Ganczak M, Bernsen R, Al-Maskari F, El Agab H, Al-Awadhi F, Al-Baloushi H, Al-Dhaheri S, Al-Dhahri J, Al-Jaberi A, 2009. Effects of a rapid peer-based HIV/AIDS educational intervention on knowledge and attitudes of high school students in a high-income Arab country. JAIDS Journal of Acquired Immune Deficiency Syndromes 52:86–98

DeJong J, Shepard B, Roudi-Fahimi F, Ashford L, 2007. Young people's sexual and reproductive health in the Middle East and North Africa. Reprod Health. 14:8.

DESA, U., 2017. Population Division. 2017. Trends in International Migrant Stock: The 2017 Revision. United Nations Database. POP/DB/MIG/Stock/Rev.

El Sayyed, N., Kabbash, I.A. and El Gueniedy, M., 2008. Risk behaviours for HIV/AIDS infection among men who have sex with men in Cairo, Egypt. *EMHJ-Eastern Mediterranean Health Journal, 14 (4), 905–915, 2008*.

Elhadi M, Elbadawi A, Abdelrahman S, Mohammed I, Bozicevic I, Hassan EA, Elmukhtar M, Ahmed S, Abdelraheem MS, Mubarak N, Elsanousi S, 2013. Integrated bio-behavioural HIV surveillance surveys among female sex workers in Sudan, 2011–2012. Sexually transmitted infections. 89(Suppl 3):iii17–22

El-Nawawy, A. N., 2008. The effect of health education on HIV knowledge and attitude of medical students. The Egyptian Journal of Community Medicine, 26(3).
IOM, 2012. Youth Behavioural Survey Report: Somalia 2012.
Jiang H, Zhou Y, Tang W, 2020. Maintaining HIV care during the COVID-19 pandemic. The Lancet HIV. 7(5):e308–9.
Johnston LG, Alami K, El Rhilani MH, Karkouri M, Mellouk O, Abadie A, Rafif N, Ouarsas L, Bennani A, El Omari B, 2013. HIV, syphilis and sexual risk behaviours among men who have sex with men in Agadir and Marrakesh, Morocco. Sexually transmitted infections. 89(Suppl 3):iii45–8
Maatouk I, Assi M, 2020. Assessment of Neisseria gonorrhea prevalence and resistance in the Eastern Mediterranean Region. Dermatol Ther *(in press)*
Maatouk I, Assi M, Hermez J, 2019. Partner notification in the Eastern Mediterranean Region: is there a way? East Mediterr Health J. 25:660–7
Maatouk I, Assi M, Jaspal R, 2020a. How can we enhance sexual health outcomes in men who have sex with men in Lebanon? BMJ Sex Reprod Health *(in press)*
Maatouk I; Nakib M, Assi M, Farah P, Makso B, Nakib C, Rady A, 2020b. Community-led HIV self-testing for men who have sex with men in Lebanon: lessons learned and impact of COVID-19. BMC Supplements (in press)
Maatouk I, Assi M, Jaspal R. 2020c. Predicting sexual risk and sexual health screening in a sample of university students in Lebanon: a cross-sectional study. Eastern Med Health J (in press)
Madani N, 2018. Gender equality is crucial to the fight for better HIV treatment access and outcomes in the MENA region. Journal of the International AIDS Society. 21(3).
Mumtaz GR, Hilmi N, Majed EZ, Abu-Raddad LJ, 2020a. Characterising HIV/AIDS knowledge and attitudes in the Middle East and North Africa: Systematic review and data synthesis. Global Public Health. 15:275–98.
Mumtaz GR, Chemaitelly H, Abu-Raddad LJ, 2020b. The HIV Epidemic in the Middle East and North Africa: Key Lessons. Handbook of Healthcare in the Arab World. Springer Nature Switzerland AG 2020 1 I. Laher (ed.).
Navadeh S, Mirzazadeh A, Gouya MM, Farnia M, Alasvand R, Haghdoost AA, 2013. HIV prevalence and related risk behaviours among prisoners in Iran: results of the national biobehavioural survey, 2009. Sexually transmitted infections. 89(Suppl 3):iii33–6
Salameh, P., Zeenny, R., Salamé, J., Waked, M., Barbour, B., Zeidan, N., & Baldi, I., 2016. Attitudes towards and practice of sexuality among university students in Lebanon. *Journal of Biosocial Science, 48(02), 233–248.*
Shawky S, Soliman C, Kassak KM, Oraby D, El-Khoury D, Kabore I, 2009. HIV surveillance and epidemic profile in the Middle East and North Africa. Journal of acquired immune deficiency syndromes (1999). 51(Suppl 3):S83.
Sugathan S, Swaysi M, 2012. Knowledge about HIV/AIDS among Premedical Students in Misurata, Libya and the Effectiveness of a Health Education Intervention. J Community Med Health Educ. 2:2161–711.
The Global Gender Gap Report 2017. World Economic Forum. Available from: https://www.weforum.org/reports/the-global-gender-gap-report-2017
The World Bank, 2018. Harmonised List of Fragile Situations FY19. Available at: http://pubdocs.worldbank.org/en/892921532529834051/FCSList-FY19-Final.pdf
UNAIDS, 2015. HIV in the Middle East and North Africa 2013 – 2015. Available at: https://open.unaids.org/sites/default/files/documents/HIV%20in%20MENA.pdf
UNAIDS. 2020 Global AIDS Update: Seizing the Moment; July 2020. UNAIDS. AIDS info website; accessed July 2020, available at: http://aidsinfo.unaids.org/. UNAIDS. Core Epidemiology Slides; July 2020.
United Nations, 2015. *Transforming our world: the 2030 Agenda for Sustainable Development.*
United Nations, 2017. World population prospects 2017.

Valadez JJ, Berendes S, Jeffery C, Thomson J, Othman HB, Danon L, Turki AA, Saffialden R, Mirzoyan L, 2013. Filling the knowledge gap: measuring HIV prevalence and risk factors among men who have sex with men and female sex workers in Tripoli, Libya. PLoS One. 8:e66701.

World Health Organization, 2016. HIV/AIDS. Guidelines on HIV Self-Testing and Partner Notification. Available at http://apps.who.int/iris/bitstream/10665/251655/1/9789241549868-eng.pdf

World Health Organization Eastern Mediterranean Regional Office, 2020. Updates on COVID-19. Available at: http://www.emro.who.int/pandemic-epidemic-diseases/covid-19/covid-19-situation-updates-for-week-31-26-july1-august-2020.html