



# Status of the HIV epidemic in key populations in the Middle East and north Africa: knowns and unknowns

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The Middle East and north Africa is one of only two world regions where HIV incidence is on the rise, with most infections occurring among key populations: people who inject drugs, men who have sex with men, and female sex workers. In this Review, we show a trend of increasing HIV prevalence among the three key populations in the Middle East and north Africa. Although the epidemic continues at a low level in some countries or localities within a country, there is evidence for concentrated epidemics, with sustained transmission at considerable HIV prevalence among people who inject drugs and men who have sex with men in over half of countries in the region with data, and among female sex workers in several countries. Most epidemics emerged around 2003 or thereafter. The status of the epidemic among key populations remains unknown in several countries due to persistent data gaps. The HIV response in Middle East and north Africa remains far below global targets for prevention, testing, and treatment. It is hindered by underfunding, poor surveillance, and stigma, all of which are compounded by widespread conflict and humanitarian crises, and most recently, the advent of COVID-19. Investment is needed to put the region on track towards the target of eliminating HIV/AIDS as a global health threat by 2030. Reaching this target will not be possible without tailoring the response to the needs of key populations, while addressing, to the extent possible, the complex structural and operational barriers to success.

## Introduction

The Middle East and north Africa is one of only two world regions where HIV incidence continues to grow.<sup>1</sup> Most HIV transmission in the region occurs in the context of high-risk sexual and injecting networks.<sup>2–8</sup> UNAIDS estimated that, in 2020, 95% of new infections in the Middle East and north Africa occurred among key populations, namely people who inject drugs, men who have sex with men, and female sex workers, and the sexual partners of all of these groups.<sup>1</sup>

With two-thirds of newly acquired infections globally occurring among key populations and their sexual partners,<sup>1</sup> UNAIDS formulated a new set of targets for 2025,<sup>9</sup> with a focus on closing gaps in intervention coverage among key populations to accelerate progress towards the Sustainable Development Goal (SDG) of HIV elimination by 2030.<sup>10,11</sup> The newly set targets of the strategy entail reaching, by 2025, the 95–95–95 testing and treatment targets within all subpopulations and achieving 95% coverage for effective combination prevention interventions in populations at risk of HIV and 90% coverage for linkage to integrated health services for both people living with HIV and populations at risk of HIV.<sup>9,12</sup> Additional targets include reducing to less than 10% each: the proportion of countries with punitive laws that limit access to HIV services; the proportion of people with HIV/AIDS experiencing stigma and discrimination; and the proportion of women, people with HIV/AIDS, and key populations experiencing gender inequality and violence.<sup>9,12</sup>

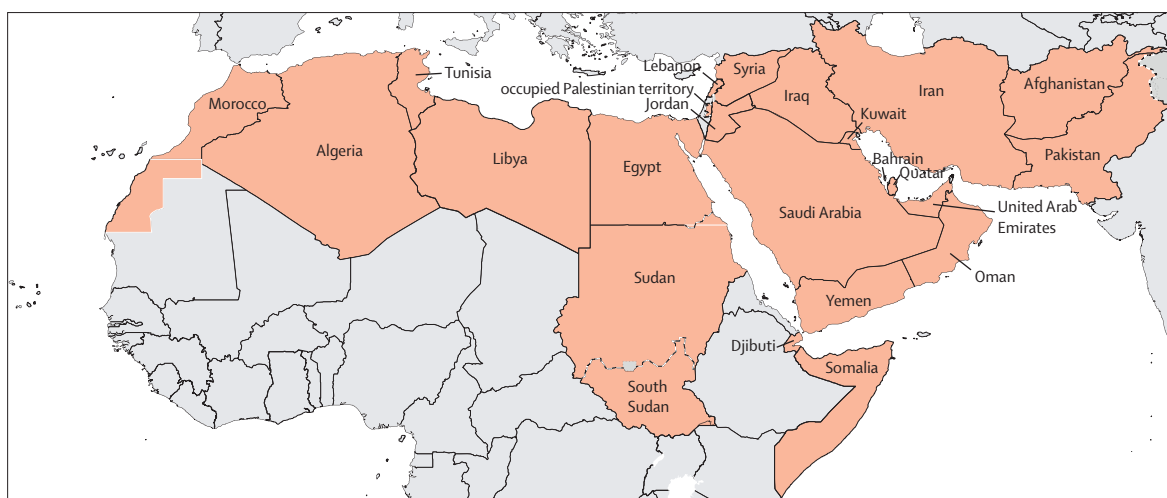
In 2020, the Middle East and north Africa were behind all other regions on key indicators for the HIV response. As per UNAIDS definition of the Middle East and north Africa, it was estimated that in 2020 only 61% of people living with HIV/AIDS were aware of their status, only 43% were linked to care, and only

37% achieved viral suppression,<sup>1</sup> falling short of the targets set by UNAIDS for 2020.<sup>13</sup> The treatment cascade among key populations is poorly understood, but scattered data suggest a bleak reality. In a region where the HIV epidemic is strongly affecting key populations, this poor treatment cascade raises serious concerns about the feasibility of achieving the more ambitious targets set for 2025.

In this Review, we provide an overview of the current understanding of the HIV epidemic among key populations across the Middle East and north Africa region (figure 1), building on earlier systematic reviews<sup>14–16</sup> and evidence beginning in 2011. Summary statistics presented here are on the basis of available data from all countries. We also discuss the settings of vulnerability that are due to conflict and humanitarian emergencies, the long-standing challenges to HIV response among key populations, and the impact of the COVID-19 pandemic on the HIV epidemic and the HIV response among these populations.

## People who inject drugs

It is estimated that there are 638 602 (range 459 345–1 270 101) people who inject drugs in the Middle East and north Africa.<sup>17</sup> There is substantial heterogeneity in the proportion of the population engaging in injected drug use in different countries, but the mean of 0·24 per 100 adults<sup>14</sup> across the studied countries is similar to global figures.<sup>18</sup> Data on women who inject drugs are scarce; the overwhelming majority of people who inject drugs in available studies are men. Although women who inject drugs might be under-represented in the literature because of higher stigma than men who inject drugs, the totality of the evidence suggests that the practice of injecting drugs in the Middle East and north Africa is largely concentrated among men.<sup>14,18</sup>



**Figure 1: Map of the Middle East and north Africa region**

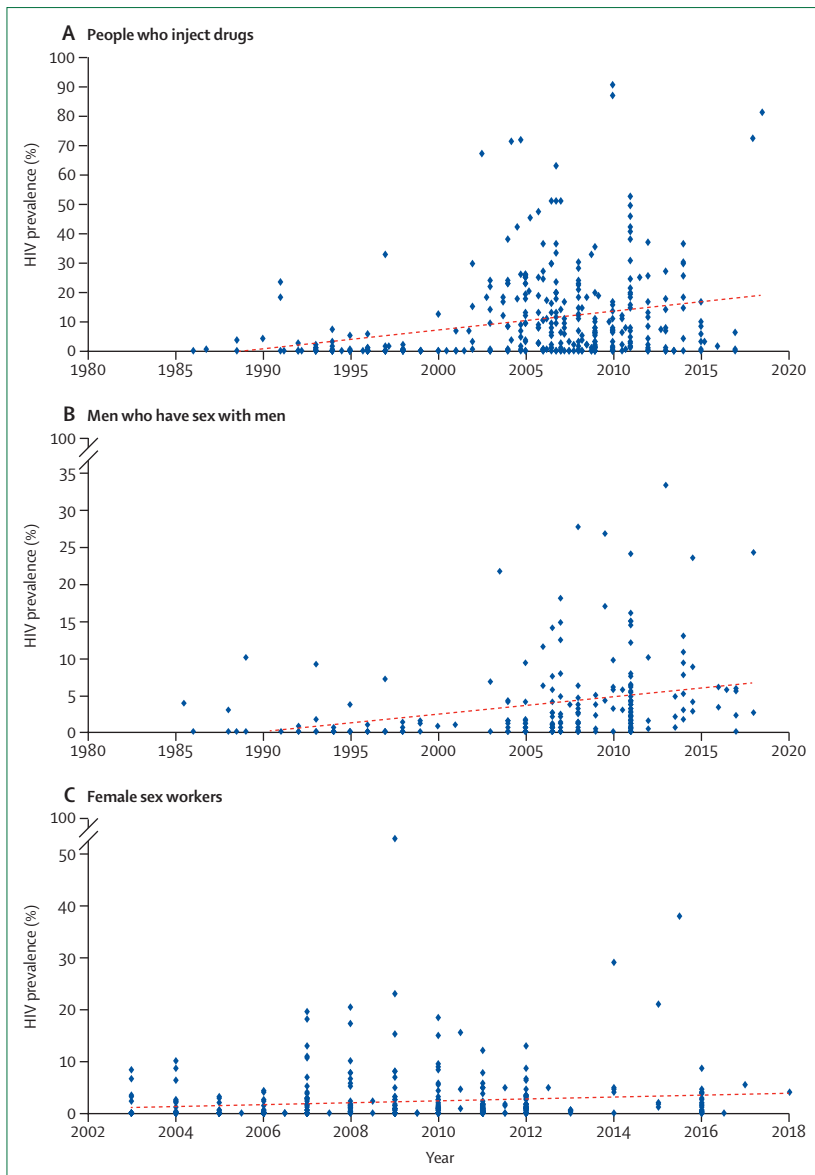
The definition adopted in the Review includes the following 24 countries: Afghanistan, Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Pakistan, the occupied Palestinian territory, Qatar, Saudi Arabia, Somalia, South Sudan, Sudan, Syria, Tunisia, United Arab Emirates, and Yemen. Note that the WHO definition of the Middle East and north Africa excludes Algeria; UNAIDS definition of the region excludes Afghanistan, the occupied Palestinian territory, and Pakistan; and the World Bank definition of the region excludes Afghanistan, Pakistan, Somalia, and Sudan. South Sudan is included here for historical reasons.

Since 2003, HIV prevalence among people who inject drugs has increased across countries (figure 2A). There is evidence from the database compiled in this Review in a third of countries in the region (eight of 24) for concentrated HIV epidemics among people who inject drugs (HIV prevalence  $\geq 5\%$ ), with the most common pattern being that of emerging HIV epidemics (table). In countries that have concentrated HIV epidemics among people who inject drugs, the median HIV prevalence for this key population was 9% (IQR 3–21) after 2010. This median is lower than the estimated prevalence of HIV among people who inject drugs globally, which is understood to be 17.8%.<sup>18</sup> However, very high prevalence of HIV in people who inject drugs was reported in some groups in the region such as in Tripoli, Libya, in which the 2010 integrated biobehavioural surveillance (IBBS) survey, the only one done in Libya, documented a HIV prevalence among people who inject drugs of 87.1%, which is one of the highest in the world for this key population.<sup>19</sup> Although this elevated prevalence from a single city might not be nationally representative of the HIV epidemic among people who inject drugs in Libya, it substantiates the existence of groups with extremely high transmission. Since 2016, the HIV epidemic among people who inject drugs appears to have reached endemic equilibrium in Iran and Pakistan, with both having a nearly constant HIV prevalence following an earlier peak, which apparently stabilised at around 9% in Iran and 20% in Pakistan. In six countries the epidemic is at low level (panel 2) with no evidence for sustained transmission except in Tunisia, where HIV prevalence appeared to be stable at 3–4% around 2014 (more recent data unavailable). We could not identify data for the remaining nine countries. The status of the HIV epidemic among people who inject drugs in

these remaining countries remains unknown and does not preclude the possibility of hidden epidemics.

Behavioural data indicate substantial risk for those who inject drugs, which suggests that there is potential for further HIV spread. Sharing needles or syringes is the key risk factor that exposes people who inject drugs to HIV infection. About half of people (IQR 16–62) who inject drugs in the Middle East and north Africa reported ever sharing needles or syringes, but rates of over 80% have been reported for several groups of people who inject drugs such as those in Iran,<sup>20–22</sup> Libya,<sup>19</sup> and Pakistan.<sup>23</sup> Across all countries, the act of sharing needles or syringes in the past 12 months was reported by 31% (IQR 8–49) of people who inject drugs, and 18% (11–22) reported sharing needles or syringes in the last injection, with the highest rates coming from Egypt and Pakistan.<sup>14</sup>

People who inject drugs in the Middle East and north Africa report sexual activity with stable sexual partners (35% [IQR 26–50] are currently married) and with members of other key populations. Overlap of sexual risk behaviour between people who inject drugs and men who have sex with men was documented, with a median 12% (IQR 2–19) of people who inject drugs reporting sex with other men in the last year; this figure included engagement in sex work (both sex for money and purchasing sex with other male individuals). In the only IBBS survey done in Syria, in 2014, 19% of people who inject drugs reported having sex with other men in the past year and 55% reported ever having practised sex work themselves.<sup>24</sup> This is the highest proportion of male sex work reported among people who inject drugs in the region. Across all the studied countries, 40% (IQR 28–61) of people who inject drugs reported ever having sex with female sex workers.



**Figure 2: Trend of HIV prevalence among key populations in the Middle East and north Africa, 1980–2020**  
 This graph displays all available HIV prevalence measures for all countries combined among people who inject drugs (A; 18 countries), men who have sex with men (B; 15 countries), and female sex workers (C; 17 countries) in the Middle East and north Africa. The dashed lines show linear trends in HIV prevalence data over time. Data used to generate these graphs were provided through the updated databases of the earlier systematic reviews<sup>14–16</sup> among the three key populations in the Middle East and north Africa. The data sources and search criteria used to build these databases are described in the Search strategy and selection criteria panel, and the citations of all studies and reports they include are listed in the appendix.

See Online for appendix

### Men who have sex with men

Estimations for risk-group size for men who have sex with men are scarce in the Middle East and north Africa. Scattered evidence suggests that around 1–3% of men in the studied countries have sex with men, which is similar to global figures.<sup>15</sup> Some risk-group size estimation studies on men who have sex with men found a low population proportion of men who have sex with men, such as 0.2% in Afghanistan<sup>25</sup> and 0.5% in Iran.<sup>26</sup>

However, a large proportion of men who have sex with men might belong to hidden networks not accessed in these studies, which could explain these low estimates.

Overall, since 2003, a trend of rising HIV prevalence has been observed among men who have sex with men, near the same time of the emergence of epidemics among people who inject drugs (figure 2B). In about half of the studied countries (11 of 24), there were no data and, hence, the status of the epidemic could not be ascertained (table). Among countries with data, over half (seven of 13) have had concentrated epidemics among their populations of men who have sex with men with a median HIV prevalence of 4% (IQR 1–7) after 2010. HIV prevalence among men who have sex with men in all of these countries has exceeded 5% in their most recent good quality (panel 1) surveys. These epidemics seem to be emerging in Egypt, Morocco, and Pakistan; to have stabilised in Lebanon at prevalence around 3–5% with some pockets of higher prevalence documented;<sup>27</sup> and to have reached a concentrated prevalence of 5% in Sudan, Tunisia, and Yemen, although there is no evidence of whether HIV prevalence has stabilised or is continuing in an increasing trend in these three countries. Outbreak-type HIV epidemics among men who have sex with men (panel 2) have been documented in Iran and Libya and the HIV epidemic seems to be at low level in the remaining four countries (Afghanistan, Jordan, South Sudan, and Syria) based on the available evidence (table).

Behavioural data suggest an environment of high sexual risk behaviour among men who have sex with men with large reported numbers of sexual partners and overall low condom use. The number of casual, non-commercial sex partners in the last week ranged from three to seven partners, whereas a median of 28 (IQR 21–40) commercial partners was reported in the last month by male sex workers. Condom use at last sex among men who have sex with men was low, reported by a median of 27% (IQR 13–45) with non-commercial partners and 30% (18–46) with commercial partners. Overall, the highest rates of condom use were reported in Lebanon and Tunisia, two countries with comprehensive HIV/AIDS knowledge among key populations and active community-based organisations.<sup>28</sup> Only a median of 2% (IQR 1–5) of men who have sex with men reported injecting drugs across the studied countries. There are insufficient data on the proportion of men who have sex with men who also have sex with female sex workers.

### Female sex workers

Female sex workers constitute less than 1% of reproductive-age women in the Middle East and north Africa (median 0.6% [range 0.2–2.4]), but have a much larger client population that constitutes around 6% of men (median 5.7% [range 0.3–13.8]) in the general population.<sup>16</sup> The HIV epidemic among female sex workers is at low level in half of countries (12 of 24), with

	People who inject drugs		Men who have sex with men		Female sex workers	
	Epidemic state classification	Strength of evidence	Epidemic state classification	Strength of evidence	Epidemic state classification	Strength of evidence
Afghanistan	Concentrated, emerging	Good	Low level, no sustained transmission	Limited	Low level, no sustained transmission	Limited
Algeria	No evidence	..	No evidence	..	Low level, endemic transmission	Limited
Bahrain	Concentrated, emerging	Poor	No evidence	..	No evidence	..
Djibouti	No evidence	..	No evidence	..	Concentrated, established	Limited
Egypt	Concentrated, emerging	Good	Concentrated, emerging	Good	Low level, no sustained transmission	Limited
Iran	Concentrated, established	Conclusive	At least outbreak-type	Limited	Low-level, endemic transmission	Good
Iraq	No evidence	..	No evidence	..	Low level, no sustained transmission	Poor
Jordan	Low level, no sustained transmission	Limited	Low level, no sustained transmission	Limited	Low level, no sustained transmission	Limited
Kuwait	Low level, no sustained transmission	Poor	No evidence	..	No evidence	..
Lebanon	Low level, no sustained transmission	Good	Concentrated, established	Good	Low level, no sustained transmission	Limited
Libya	Concentrated, no clear trend	Limited	At least outbreak-type	Limited	At least outbreak-type	Limited
Morocco	Concentrated, emerging	Limited	Concentrated, emerging	Limited	Low level, endemic transmission	Good
Occupied Palestinian territory	Low level, no sustained transmission	Good	No evidence	..	No evidence	..
Oman	At least outbreak-type	Poor	No evidence	..	No evidence	..
Pakistan	Concentrated, established	Conclusive	Concentrated, emerging	Conclusive	Concentrated, emerging	Conclusive
Qatar	No evidence	..	No evidence	..	No evidence	..
Saudi Arabia	Concentrated, emerging	Poor	No evidence	..	No evidence	..
Somalia	No evidence	..	No evidence	..	Concentrated, established	Limited
South Sudan	No evidence	..	Low level, no clear trend	Poor	Concentrated, established	Good
Sudan	No evidence	..	Concentrated, no clear trend	Limited	Low level, endemic transmission	Limited
Syria	Low level, no sustained transmission	Limited	Low level, no sustained transmission	Limited	Low level, no sustained transmission	Poor
Tunisia	Low level, endemic transmission	Limited	Concentrated, no clear trend	Limited	Low level, no sustained transmission	Limited
United Arab Emirates	No evidence	..	No evidence	..	No evidence	..
Yemen	No evidence	..	Concentrated, no clear trend	Poor	Low level, no sustained transmission	Limited

Classification was based on the level of and trend in HIV prevalence and on the quality of available supporting evidence. The definitions under this classification are described in panel 1. The data to generate these findings were provided through the updated databases of the earlier systematic reviews<sup>34-36</sup> among the three key populations in the Middle East and north Africa. The citations of all studies and reports they include are listed in the appendix.

**Table: HIV epidemic state classification among key populations in countries of the Middle East and north Africa**

evidence of endemic transmission at around 2–4% HIV prevalence in Algeria, Iran, Morocco, and Sudan, and 5% prevalence in Somalia (table). Overall, HIV prevalence reveals high heterogeneity ranging from 0% in close to half of female sex worker populations to 38%<sup>29</sup> in South Sudan, and about 20%<sup>30-32</sup> in Djibouti after an earlier peak of 70% in the late 1990s.<sup>33</sup> In Djibouti, Somalia, and South Sudan the HIV epidemic is established among female sex workers (table).

Although the median HIV prevalence among female sex workers in the Middle East and north Africa remains overall low at only 0.1%, since 2000, HIV prevalence seems to have grown at a rate of 15% per year, starting from very low levels (figure 1C).<sup>16</sup> The trend of rising prevalence reflects emerging epidemics and identifies pockets of high HIV prevalence in several countries in the region.<sup>16</sup> In Pakistan, emerging HIV epidemics have been documented among female sex workers in half of cities surveyed during the 2016–17 IBBS, with prevalence ranging from 2% to 9%<sup>34</sup> after being consistently below 1% in previous surveys.<sup>35-37</sup> High HIV prevalence has

also been documented in specific pockets of female sex workers, even in countries characterised by overall low-level endemic HIV transmission, such as at 20% HIV prevalence in Tamanrasset, Algeria; 15% in Tripoli, Libya; 8% in Red Sea State, Sudan; and 5–6% in Souss Massa Draa, Morocco.<sup>16</sup>

Nevertheless, behavioural data suggest a low-risk environment among female sex workers in the Middle East and north Africa with a reported median of 34 clients in the past month (IQR 19–50), which is lower than that reported in other regions.<sup>38-41</sup> This conclusion is supported by the lower prevalence of other sexually transmitted infections (STIs) among female sex workers in the Middle East and north Africa compared with other regions.<sup>42</sup> Though considerable, condom use at last sex is still suboptimum with a median coverage of 44% (IQR 25–62).<sup>16</sup> Injecting drug use among female sex workers appears low: less than 1% of female sex workers reported current injecting drug use in most countries, and a median of 2% (IQR 1–6) of female sex workers reported injecting drugs in the past 12 months.<sup>16</sup> Most

### Panel 1: Definitions used for the classification of HIV epidemic state and quality of supporting evidence<sup>14</sup>

#### Classification of HIV epidemic state among a key population

- Low-level HIV epidemic: HIV has not reached considerable levels among the key population; there could be no evidence of appreciable sustained transmission (HIV prevalence in the range of 0–1%), or evidence for low-level endemic transmission (sustained transmission with HIV prevalence in the range of 2–4%), or evidence for low-level transmission with uncertain trends (HIV prevalence in the range of 2–4% but not enough data to inform on epidemic trends)
- Concentrated HIV epidemic: HIV has reached considerable levels among the key population, typically  $\geq 5\%$ ; concentrated epidemic could be either emerging (HIV has started its initial growth and continues in a trend of increasing prevalence) or established (the epidemic has reached a peak and HIV prevalence is stabilising towards, or already is at, its endemic level)
- At least outbreak-type: insufficient evidence to support a concentrated epidemic classification among the key population, but some evidence, usually of lower quality, suggests that substantial HIV transmission has occurred or is occurring among at least some key population sub-groups

#### Classification of the quality\* of evidence supporting the HIV epidemic state designation in a key population

- No evidence: virtually no data
- Poor evidence: the majority of HIV prevalence measures are of poor quality
- Limited evidence: the number of HIV prevalence measures is small, but of reasonable quality or of good quality but outdated ( $>5$  years old)
- Good evidence: the number of HIV prevalence measures is small, but with good quality and informative data; however, the overall volume of data is not sufficient to be conclusive of the status and scale of the epidemic at the national level
- Conclusive evidence: there is a sufficient volume of recent quality evidence to support the conclusion

\*The quality of the data was based on a qualitative assessment, described in a previous publication,<sup>14</sup> and combining several factors including the presence and number of integrated biobehavioural surveillance surveys, geographical coverage of available studies, individual studies' methods and sample size, and other considerations.

studies with higher injected drug use were situated in Pakistan and Iran.<sup>16</sup> Sex with people who inject drugs in the past 12 months varied and was reported by a median of 5% (IQR 2–10) of female sex workers in Afghanistan,<sup>16</sup> a median of 6% (2–18) in Pakistan,<sup>16</sup> and 24% in Iran.<sup>43</sup>

The overall lower risk environment in the Middle East and north Africa compared with other regions, in addition to the protective effect of male circumcision

### Panel 2: Existing knowledge and gaps in evidence

- There was a marked improvement in availability of quality epidemiological evidence in the Middle East and north Africa between 2000 and 2015 when a number of integrated biobehavioural surveillance (IBBS) surveys were done (in 16 of the 24 countries), facilitated by an influx of international donor funding
- This initial optimism for a meaningful HIV response is now overshadowed by the sharp decline in HIV surveillance funding, which is consistent with overall reductions in funding for HIV response in the Middle East and north Africa
- Major gaps in evidence on the spread of HIV among all key populations persist with large heterogeneity between countries in the number and quality of available studies; there is almost no evidence to meaningfully characterise the status of the epidemic among people who inject drugs in nine countries in the region, among men who have sex with men in 11 countries, and among female sex workers in seven countries
- When evidence exists, data are often on only one or two key populations, of only low geographical representation, or based on non-probability sampling; in some countries, there is only a single round of IBBS conducted, or no recent studies at all; in countries where one or more rounds of IBBS have been conducted, many of the studies are outdated
- There is a notable gap in risk group size estimations; most countries have estimates for the population size of people who inject drugs; however, less than half of countries in the region have estimates for the population size of female sex workers and only a third have estimates for the population size of men who have sex with men

against HIV acquisition in heterosexual sexual acts<sup>44–49</sup> in a region where male circumcision is nearly universal,<sup>50</sup> contribute to the mostly small-scale HIV epidemics among female sex workers in the Middle East and north Africa, and to the observed low HIV prevalence levels that are substantially lower than those observed among people who inject drugs and men who have sex with men in this region.<sup>3</sup>

### HIV response: status and barriers

Criminality<sup>6,51</sup> and stigma<sup>52,53</sup> are barriers to addressing the HIV epidemic in the Middle East and north Africa, as is the case globally. UNAIDS' 2021 Global AIDS report indicates that 21 of the 24 countries in the region have punitive laws against sex work; 19 have punitive laws against same-sex sexual acts, of which seven mandate the death penalty; nine have laws prohibiting possession of drugs for personal use; and the rest have no data or no specific legislation.<sup>1</sup> In some settings, there is resistance to acknowledge the existence of behaviours

such as sex work<sup>16</sup> or same-sex sexual acts,<sup>15</sup> which are often classified in HIV case notification reports as transmission due to sexual transmission or to an unidentifiable risk.<sup>15</sup> Criminalisation and stigma not only impede the HIV response among key populations in the region, but also pose additional challenges to surveillance efforts and the conduct of research.

There is a reluctance among policy makers to allocate resources for HIV programming, particularly for key populations, out of concern for sociocultural sensitivities.<sup>5,54</sup> Programmes and services, where available, are largely provided by community-based organisations that often do not have the funding or legal authority to deliver comprehensive prevention and treatment interventions to key populations.<sup>5,6</sup> Dedicated funding for HIV programmes in 2020 was less than 20% of that needed to achieve the 95–95–95 targets of the Global AIDS Strategy 2021–26.<sup>1</sup> Poor political commitment not only impedes the development of new programmes and services but also undermines existing ones. For example, a loss of funding forced several harm reduction programmes in the region to reduce or cease their operations.<sup>55</sup> Needle and syringe programmes are currently operational in only eight countries (Afghanistan, Algeria, Egypt, Iran, Lebanon, Morocco, Pakistan, and Tunisia) and only five (Afghanistan, Iran, Lebanon, Morocco, and occupied Palestinian territory) have operational opioid agonist therapy services.<sup>55</sup> Similarly, only 15 countries in the region reported adopting pre-exposure prophylaxis (PrEP) national guidelines, yet the number of PrEP users remains negligible and is reported only from three countries: Morocco, Lebanon, and to a lesser extent Pakistan.<sup>56</sup> Effectively, only Morocco has officially adopted PrEP into their national policies. Another example is how the poor regulation of police activities sometimes results in the criminalisation of individuals for carrying condoms and considering them as evidence for sex work.<sup>51,57</sup> Such practices undermine years of programme efforts promoting condom use.<sup>3</sup>

These structural factors exacerbate the increased mobility, diverse typologies, and covert nature of key populations making them even harder to reach.<sup>51,58,59</sup> In 2020, the region ranked lowest globally on key HIV response indicators among people living with HIV/AIDS, not to mention key populations,<sup>1</sup> with coverage far below the 95% target of the Global AIDS Strategy 2021–26.<sup>9</sup> Among people who inject drugs, only a median of 17% (IQR 6–19) reported testing in the past 12 months, but data were sparse. A higher median proportion of 42% (IQR 25–43) of men who have sex with men reported testing in the past 12 months, but these data were mostly from Lebanon, where support networks for men who have sex with men are active and well mobilised.<sup>15</sup> More data on HIV testing were found among female sex workers than people who inject drugs and men who have sex with men, indicating a low lifetime rate of testing at a median of 18% (IQR 9–35)

and a low past year rate at a median of 12% (IQR 6–18).<sup>16</sup> Overall in the region, millions of HIV tests are conducted every year with most being among low-risk population groups such as migrant workers and antenatal clinic attendees with very low positivity rates.<sup>5,60</sup> This highlights the need to shift resources to reaching and testing key populations in which most infections are occurring.

Very few data are available on linkage to care among HIV-positive key populations in the Middle East and north Africa.<sup>2,3,61</sup> However, only 43% of people with HIV in the Middle East and north Africa (using the UNAIDS definition of the region) are estimated to be on antiretroviral therapy (ART).<sup>1</sup> This coverage is not only the lowest globally,<sup>1</sup> but also lower than the WHO regional target for 2015 of 50% coverage.<sup>62</sup> In an effort to improve linkage to and retention in care, some countries like Pakistan and Sudan are implementing a search-and-rescue strategy to actively identify people with HIV and reduce attrition.<sup>63</sup> This approach, however, remains rare in the region. Data on viral suppression among HIV-positive key populations with access to care could not be identified, but only 37% of people with HIV living in the region defined by UNAIDS as Middle East and north Africa are estimated to be virally suppressed.<sup>1</sup> With such poor performance on response indicators, the Middle East and north Africa is very unlikely to fulfil the SDG target of ending the AIDS epidemic by 2030 without substantial and concerted effort.<sup>10,11</sup> There is an urgent need to adopt strategies to enhance linkage and adherence to care such as decentralised HIV services, rapid initiation of ART, multimonth drug dispensing, instituting stigma-free and positive interactions with the health-care system, establishing systems for active patient follow-up, and incorporating mental health support for people with HIV and health-care workers alike.

As clearly reflected in the 2025 UNAIDS targets, improving outreach to key populations entails revisiting current punitive legislation and developing programmes aimed at alleviating sociocultural sensitivities related to key populations. However, such initiatives are difficult to realise in the short term. Addressing these challenges in the immediate term requires a visionary political agenda that ensures rapid expansion of HIV programmes, even while punitive laws remain unaltered or are still in the process of being revised. The mitigation of these challenges is exemplified by Iran, which is a leader in harm reduction, and was the first country in the Middle East and north Africa to extend needle and syringe programmes to prisons and to establish gender-sensitive harm reduction services.<sup>14</sup>

In most settings, the role of non-governmental organisations has been crucial in delivering services to highly hidden key populations. This delivery through non-governmental organisations has been a successful model in countries where these organisations are supported by the government. In Morocco, the government channelled its HIV response through close partnerships with community-based organisations that

were empowered to deliver comprehensive services for at-risk populations, including outreach peer-education programmes and testing and case management services.<sup>6</sup> Lebanon also serves as a successful example where non-governmental organisations such as Helem, *Soins Infirmiers et Développement Communautaire* (known as SIDC), Proud Lebanon, and Marsa have been providing comprehensive HIV and STI services for men who have sex with men and other key populations, gaining the trust of the communities they serve and operating as an entry point for their outreach. Such models need to be strengthened and replicated, while addressing structural factors and providing enabling environments for people living with HIV/AIDS to access HIV treatment and prevention services. Mathematical modelling studies among people who inject drugs<sup>2</sup> and female sex workers<sup>3</sup> in the Middle East and north Africa have shown that the introduction of even moderate levels of individual or combined HIV prevention and treatment services is likely to have a substantial impact in reducing HIV incidence among these key populations and their sexual partners.

For Helem see <https://www.helem.net/>

For SIDC see <https://sidc-lebanon.org/>

For Proud Lebanon see <http://proudlebanon.org/>

For Marsa see <https://marsa.me/>

### Impact of conflict and humanitarian emergencies

Over the past decade, countries in the region have experienced substantial sociopolitical and economic crises characterised by protracted armed conflicts and massive forced displacements. These compounding humanitarian crises carry implications for the transmission, progression, and severity of HIV infection.<sup>64,65</sup> Studies conducted in sub-Saharan Africa paradoxically found a lower HIV prevalence in conflict settings, attributed in part to a decline in mobility and urbanisation during periods of war.<sup>5</sup> However, such conditions might not be applicable to the Middle East and north Africa, where long-standing conflicts have displaced millions of people who typically settle in urban settings within neighbouring countries.<sup>66–68</sup> Although the impact of these humanitarian crises on HIV incidence and related morbidity and mortality has not been directly estimated in the Middle East and north Africa, their effects on various determinants of HIV infection has been documented.

Structural determinants of HIV transmission and severity, such as poverty, food insecurity, and trauma exposure disproportionately impact conflict-affected populations.<sup>64</sup> Women are particularly vulnerable because of increases in both sexual violence and participation in sex work and diminished accessibility to sexual and reproductive health-care services.<sup>64</sup> Forced displacement exacerbates this vulnerability, probably through the creation of new sexual networks in contexts of psychological trauma and extreme poverty.<sup>64</sup> An increase in sex work, early marriage, and sex trafficking has been well documented in refugee women from the Middle East and north Africa after their displacement,<sup>69–74</sup> although the association with HIV infection is not known.

Key populations, who are often socially and economically disadvantaged, are also disproportionately affected by conflict and humanitarian emergencies. Sexual and injecting risk behaviours have been described as increasing in diverse emergency-affected contexts throughout the region. These behaviours might be used as coping mechanisms for trauma-related and displacement-related stressors,<sup>75–77</sup> and could be exacerbated by an increased prevalence of psychiatric comorbidities as was documented among refugees who are men who have sex with men living in Lebanon.<sup>78</sup> An association between war-related stress and illicit substance use was found among young people in Libya and could be correlated with a higher risk of HIV acquisition,<sup>75</sup> particularly in such contexts with concentrated and high prevalence HIV epidemics among people who inject drugs.<sup>19</sup> Evidence from Lebanon, where political instability and an unprecedented economic crisis has moved 75% of the population into poverty,<sup>79</sup> indicates an increase in unprotected intercourse among men who have sex with men despite the implementation of pandemic-related lockdown measures, possibly due to political and economic stressors; economic stressors might additionally affect condom accessibility.<sup>80</sup> Similarly, a high prevalence of sex work (36%) and unprotected anal intercourse (85%) was documented among Iraqi, Palestinian, and Syrian refugees who are men who have sex with men living in Lebanon.<sup>81</sup> About 3% of this sample had HIV, and the high self-reported lifetime prevalence of STIs at 60% suggests an environment of high sexual risk.<sup>81</sup>

The overburdening and fragmentation of already fragile health-care systems in humanitarian settings throughout the region limits HIV surveillance and accessibility to health-care services, including HIV prevention and treatment.<sup>70,72,82</sup> For example in Syria, a setting of protracted armed conflict, the National AIDS Program estimates up to a 99% reduction in HIV surveillance efforts among key populations, including female sex workers and people who inject drugs following the onset of the conflict and a near halving of the country's voluntary counselling and testing capacity,<sup>83</sup> which could have serious implications for public health response planning. In Lebanon, most available voluntary counselling and testing centres are non-operational<sup>84</sup> due to the compounding crises in the country. In Yemen, surveillance efforts have similarly been affected by conflict<sup>85</sup> and armed security forces have prevented clinicians from providing care to people with HIV due to pervasive stigmatisation and misconceptions about transmission.<sup>86</sup> Although HIV cases are thought to be underestimated in the West Bank and Gaza Strip, AIDS-related mortality is high at approximately 54%, possibly due to advanced disease at the time of diagnosis.<sup>87</sup>

### The COVID-19 pandemic: challenges and opportunities

The COVID-19 pandemic has presented another challenge to the global HIV response and caused fear that it would reverse the gains achieved in the control of HIV/AIDS

since 2000.<sup>88</sup> The pandemic and its response have affected sexual behaviour and HIV prevention and treatment services globally,<sup>1,89,90</sup> both of which affect HIV incidence and mortality in the short term and long term. Emerging evidence from low-income and middle-income countries suggests that the pandemic has resulted in massive disruptions to health systems and HIV service delivery, many of which were redirected to the pandemic response.<sup>89</sup> On the basis of an assessment by WHO, nine of the 24 countries in the region reported ART disruptions between April and June, 2020, four reported no disruptions, and there were no data from the remaining 11 countries, which does not preclude the possibility of disruptions in these countries.<sup>90</sup> As the pandemic continues to hinder economic growth in countries with weak health-care infrastructures, it is possible that national HIV prevention and control programmes will suffer budgetary reductions.

Mathematical modelling studies have shown that even short interruptions in HIV prevention and treatment services can result in an increase in HIV incidence<sup>91-94</sup> and HIV-related deaths,<sup>91,92</sup> with ART interruptions predicted to have the strongest negative effect.<sup>91</sup> Although a reduction in the number of sexual partners as a result of social and physical distancing was shown to offset the predicted negative impact of service disruptions,<sup>92-94</sup> the extent and duration of the reduction in sexual risk-taking due to the pandemic is not well understood, especially in the Middle East and north Africa, where epidemiological evidence is scarce. One study from Lebanon reported a 34% increase in post-exposure prophylaxis, among men who have sex with men, during the lockdown compared with the same period in 2019, suggesting that high-risk sexual activity might have persisted.<sup>80</sup>

The COVID-19 pandemic might have increased the susceptibility of key populations to HIV infection and widened the gap in their accessibility to services.<sup>95</sup> Loss of livelihoods (eg, for sex workers unable to work due to closure of venues and clients' fear of COVID-19), residential instability, disconnection from social and peer support networks (particularly among those who are part of the LGBTQIA community), and increased fear of persecution amid mobility restrictions enforcement are some of the consequences of the pandemic that disproportionately affected key populations.<sup>95</sup>

Several lessons, however, can be learned from the COVID-19 response. Telehealth has emerged as an important tool and could be made use of on a larger scale in HIV programmes to access hard-to-reach populations in remote areas or isolated and marginalised key populations who could be reluctant to seek services due to stigma and discrimination.<sup>96,97</sup> Another important intervention involves self-testing, which could be coupled with telehealth services to improve testing rates and acceptability. In Lebanon, there was an increase in the demand for HIV self-testing among men who have sex with men during the pandemic.<sup>88</sup> This testing method was acceptable to both local and refugee men who have sex

with men who often do not have access to health care or face stigma and discrimination when they do.<sup>88</sup> To date, only four countries in the region have implemented HIV self-testing, and most countries in the region have no policy in place.<sup>60</sup> Although self-testing is promising, decentralisation of services for confirmatory testing and treatment will be crucial to ensure patient-centred services. To overcome lockdowns and mobility restrictions, several HIV programmes in the Middle East and north Africa resorted to multimonth drug dispensing, which was rare in the region before the pandemic.<sup>97</sup> This method for drug dispensing in turn could be scaled up to allow flexibility for people with HIV and to reduce the number of negative interactions with health-care facilities. This benefit was documented in Egypt where multimonth drug dispensing introduced during the pandemic was reported by 90% of people with HIV as an important factor behind their motivation to adhere to treatment.<sup>99</sup>

During the COVID-19 pandemic, webinars and online learning tools were rapidly adopted by the medical and scientific community. The use of such resources should continue to develop and include HIV management and prevention education for health-care workers and physicians across the Middle East and north Africa in an effort to spread knowledge about HIV and overcome stigma and barriers while encouraging national, regional, and international exchange of expertise and promoting the development of research networks.

## Conclusion

There is a trend of emerging HIV epidemics and increasing HIV prevalence among the three key populations in different countries in the region, with this increase being more pronounced among people who inject drugs and men who have sex with men than among female sex workers. There is evidence of concentrated HIV epidemics, with sustained transmission at considerable levels, among men who have sex with men and people who inject drugs in about half of countries in the region with data, and among female sex workers in several countries.

However, what most characterises the HIV situation in this region is neglect. Although the global HIV response has improved immensely since 2000, the Middle East and north Africa are far behind. Even where improvements occurred, they were slow, temporary, and inconsistent. The region continues to register the worst HIV response indicators of all regions and is very far from accomplishing any of the stipulated global targets for HIV infection, all against a background of expanding epidemics. The widespread protracted conflicts, forced displacements, economic crises, and more recently, COVID-19 pandemic, exacerbated the situation and increased the susceptibility of key populations to HIV infection. To put this region on track towards the global target of eliminating HIV/AIDS by 2030 a meaningful investment must be made. This need for investment not only entails enhanced resource

### Search strategy and selection criteria

Data for this Review were extracted from earlier systematic reviews of HIV among people who inject drugs (Mumtaz and colleagues [2014]), men who have sex with men (Mumtaz and colleagues [2011]), and female sex workers (Chemaitelly and colleagues [2019]) combined with recent data that became available since their publication. Data sources included published literature in PubMed and Embase, regional databases, abstracts of major HIV and sexually transmitted infection conferences, and a large body of country-level and international organisations reports identified through the Middle East and North Africa HIV/AIDS Epidemiology Synthesis Project, UNAIDS, WHO, and US Census Bureau databases. The PubMed and Embase searches used a comprehensive list of MeSH and Emtree and free text terms corresponding to “people who inject drugs”, “men who have sex with men”, and “female sex workers”, in combination with “Middle East and north Africa” and “HIV”. The search date was Nov 23, 2021. Detailed search criteria and all method aspects can be found in respective publications, reported as per Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. There were no language or date restrictions. Eligible publications were those that had a measure of HIV prevalence or incidence in people who inject drugs, men who have sex with men, or female sex workers in any of the countries in the region. Behavioural data were extracted from included studies when available.

allocation, but also the need for engagement and commitment by all countries of the region. Importantly, tailored models with comprehensive packages of services for key populations in safe, stigma-free environments are needed to ensure that prevention, harm reduction, testing, treatment, and retention are optimised for all in need. Expanding HIV surveillance, particularly the implementation of repeated rounds of IBBS, is also essential and an urgent priority for monitoring infection trends and identifying emerging epidemics.

#### Contributors

GRM, HC, SA, and AO conducted the review of the literature and the analyses. GM and HC wrote the first draft of the article. SF conducted the review of the literature on the impact of conflict and humanitarian emergencies, NAR contributed to the review of the literature on the impact of COVID-19, and SEF provided access to country-level data. LJA led the review of the literature, data analyses, and drafting of the article. All authors contributed to discussion and interpretation of the results and to writing of the manuscript. All authors have read and approved the final manuscript.

#### Declaration of interests

We declare no competing interests.

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