Prevalence of injecting drug use and HIV, hepatitis B, and hepatitis C in people who inject drugs in the Eastern Mediterranean region: a systematic review and meta-analysis

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Summary

Background Considerable disease burden is attributed to injecting drug use (IDU). This regional systematic review and meta-analysis aimed to assess the prevalence of IDU and the characteristics of people who inject drugs in the 22 countries of the WHO Eastern Mediterranean region.

Methods We conducted a systematic review and meta-analysis on the prevalence of IDU, estimation of the population size of people who inject drugs, the characteristics of people who inject drugs, commonly injected drugs, the prevalence of HIV, hepatitis C virus, and hepatitis B virus in people who inject drugs, and opioid agonist treatment and needle and syringe programme services. We searched PubMed, Web of Science, Scopus, Embase, and the Index Medicus for the Eastern Mediterranean Region for documents published between Jan 1, 2010, and April 17, 2022, with no language restrictions. We also searched government reports, civil society information, and UN websites and databases for grey literature published between Jan 1, 2010, and April 17, 2022. Documents were eligible if they reported or estimated an indicator of interest, or reported enough data to permit calculation of the indicator. We extracted data from the eligible documents and calculated national and regional estimates.

Findings We identified 38 283 documents and included 201 documents in the systematic review. A total of 115 documents were included for the four outcomes for which meta-analyses were performed. The number of people who inject drugs was estimated as 864 597 (95% CI 641 909–1 205 255), amounting to a prevalence of 20·0 per 10 000 adults (95% CI 14·9–27·9) in the region. Among people who inject drugs, the prevalence of HIV was estimated as 19·22% (95% CI 12·86–26·36), hepatitis C virus as 44·82% (29·32–61·16), and hepatitis B virus as 2·66% (0·84–7·26). Countries varied greatly regarding the variables of interest and the availability of relevant data. Nine countries provided needle and syringe programme services and seven countries provided opioid agonist treatment services, mostly with very low, low, or unclear coverage.

Interpretation The prevalence of IDU in the Eastern Mediterranean region is lower than the global mean, particularly among women. The HIV infection rate is higher than the global mean, and the hepatitis C virus infection rate is lower than the global mean. Harm-reduction services are underdeveloped. Data collection on IDU and provision of services need improvement in the region.

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For the Arabic translation of the abstract see **Online** for appendix 1

For the Farsi translation of the abstract see **Online** for appendix 2

For the French translation of the abstract see **Online** for appendix 3

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Introduction

The WHO Eastern Mediterranean Region (EMR) consists of 22 countries and a population size of 431 686 592. All countries have a population with majority Muslim religion;[1] however, they vary greatly in population size, income, and socioeconomic development (appendix 4 p 2). Many EMR countries have been embroiled in internal and international conflicts, resulting in population displacement leading to individuals facing financial problems and psychological trauma.[2–4] Since the region contains major illicit drug production sites and several countries lie along major drug-trafficking routes, drug use is an important health issue.[5,6] However, data for drug use and related public health risks in the region are scarce.[7]

According to estimates over the past 5 years, 11·2–14·8 million people worldwide inject drugs each year,[8–11] and injecting drug use (IDU) is responsible for a substantial proportion of the global burden of disease associated with drug use.[12] People who inject drugs have an increased risk of death, with overdose, AIDS, and hepatitis C as primary causes.[13,14] Previous history of incarceration[15,16] and homelessness[17] can increase the probability of having HIV infection. Other characteristics of people who inject drugs, including age,[18] sex,[19,20] and types of injected drugs,[21–23] can be associated with varying risks of acquiring HIV. The evidence suggests that rigorous implementation of harm-reduction strategies, particularly opioid agonist treatment (OAT) and needle

See **Online** for appendix 4

Research in context

Evidence before this study

The UN Office on Drugs and Crime provides global estimates on injecting drug use (IDU) and associated harms in their periodical reports. We developed a search syntax (appendix 4 pp 7–11) and searched five scientific databases (ie, Pubmed, Scopus, Web of Science, Embase, and the Index Medicus for the Eastern Mediterranean Region) from Jan 1, 2010 to April 17, 2022, and found two global systematic reviews of IDU and associated harms published in 2011 and 2017. Although these global reports included regional estimates, the Eastern Mediterranean region (EMR) has always been the region with deficient information or out-of-date estimates at the subregional and country levels. Through the search, we also found two regional systematic reviews and meta-analysis studies published in peer-reviewed journals, one on the extent of HIV among people who inject drugs, published in 2014, and one on the extent of hepatitis C virus among people who inject drugs, published in 2020, which need updating given rapid changes in the social, political, and economical situation of the region and improved methods of estimating and reporting national and regional indicators in systematic reviews.

Added value of this study

Several challenges exist regarding the IDU situation assessment in the EMR. First, the data production is low in the EMR, and the available data are scattered through several hard-to-reach grey literature sources. To mitigate this challenge, we used a broad grey-literature search strategy alongside the conventional search of peer-reviewed journal databases and included 201 documents in our systematic review, of which 88 were retrieved from grey literature sources. The second limitation is the highly heterogeneous or poor-quality methodology or reporting. This study is the first regional review to develop a specific evidence-grading system to generate the most reliable estimate for each country and subregion. Additionally, due to technical or financial shortcomings, political instabilities, or strict policies regarding IDU, some countries in the region produce far less data than others at times. Hence, by categorising subregions based on geographical proximity; ethnic, cultural, and economic similarity; and extent and pattern of drug supply and demand, we both improved the accuracy of our extrapolation methods and avoided dominant patterns of countries with larger populations that publish large amounts of research on IDU. Lastly, by limiting the eligibility criteria to estimates generated in or after 2010, the results of our study could be more representative of the current situation of IDU in the EMR.

Implications of all the available evidence

The prevalence of IDU in the EMR, and the prevalence of HIV and hepatitis C virus among people who inject drugs are similar to the global estimates. There is a severe gap between the extent of IDU and the availability and coverage of harm reduction services. Expanding evidence-based and cost-effective care, increasing focus on assessing the coverage of harm reduction services, and identifying barriers to service use are essential. Most of the data are from several specific countries, namely Afghanistan, Iran, Morocco, Pakistan, and Tunisia. Other countries need to overcome the barriers to study various aspects of the drug problem.

and syringe programmes (NSPs), can effectively reduce the health burden associated with IDU.[24,25] However, despite a modest increase in the global coverage of these services in the past 5 years, they still have low coverage globally.[26]

Obtaining accurate estimates of the prevalence of IDU, the characteristics of people who inject drugs, and the major health consequences associated with IDU is challenging but crucial to inform relevant policy decisions.[27] Although some previous regional and global reports with information on the EMR are available,[9,10,28–33] updated information is necessary given rapid changes in the social, political, and economic situation of the region[2–4] and improved methods of estimating and reporting national and regional indicators. Moreover, similar to some of the previous regional reviews,[29–33] a review conducted by regional experts benefits from improved access to the hard-to-reach relevant literature and triangulation of various data sources due to familiarity with the local studies and context.

In this systematic review, we collated information on the status of IDU and service provision from 2010 to 2022 to provide updated estimates of the prevalence of IDU and population sizes of people who inject drugs in EMR countries; provide estimates for sociodemographic characteristics of people who inject drugs; estimate the most commonly injected drug; estimate the prevalence and population sizes of people who inject drugs with HIV, hepatitis C, and hepatitis B and the percentage of HIV infections due to IDU; and provide the most recent snapshot of harm-reduction policies and availability and coverage of NSPs and OAT in the region.

Methods

Search strategy and selection criteria

We conducted a systematic review and meta-analysis by adapting methods from previous similar global reviews,[9,10] and we followed the PRISMA guidelines[34] for reporting (appendix 4 pp 4–6).

We developed a search syntax (appendix 4 pp 7–11) and searched PubMed, Web of Science, Scopus, Embase, and the Index Medicus for the Eastern Mediterranean Region to retrieve documents with country-level data on the prevalence of IDU; estimation of the population size and characteristics of people who inject drugs; commonly injected drugs; the prevalence of HIV, hepatitis C virus,

and hepatitis B virus in people who inject drugs; and opioid agonist treatment and needle and syringe programme services. The search syntax consisted of two groups of key terms: terms pertaining to substances and drug use and terms pertaining to the region and subregions, EMR countries, and their major cities. On July 13, 2020, we searched for articles published since Jan 1, 2010, with no language restrictions. We updated the search on April 17, 2022. Additionally, between July 1, 2020 and Aug 30, 2021, we searched government reports, civil society information, and websites and databases of relevant UN bodies, including WHO, UN Office on Drugs and Crime, UNAIDS, and Global Fund reports for documents providing country-level data for indicators of interest from Jan 1, 2010, or later, and we updated the process on April 17, 2022. As a part of the grey literature search for each country, we used Google search commands of the country name with "illicit drugs", "illicit substances", "substance abuse", "dependence", "addiction", "addict", "cannabis", "opium", "treatment", "AIDS", "acquired immunodeficiency syndrome", "HIV", "human immunodeficiency virus",

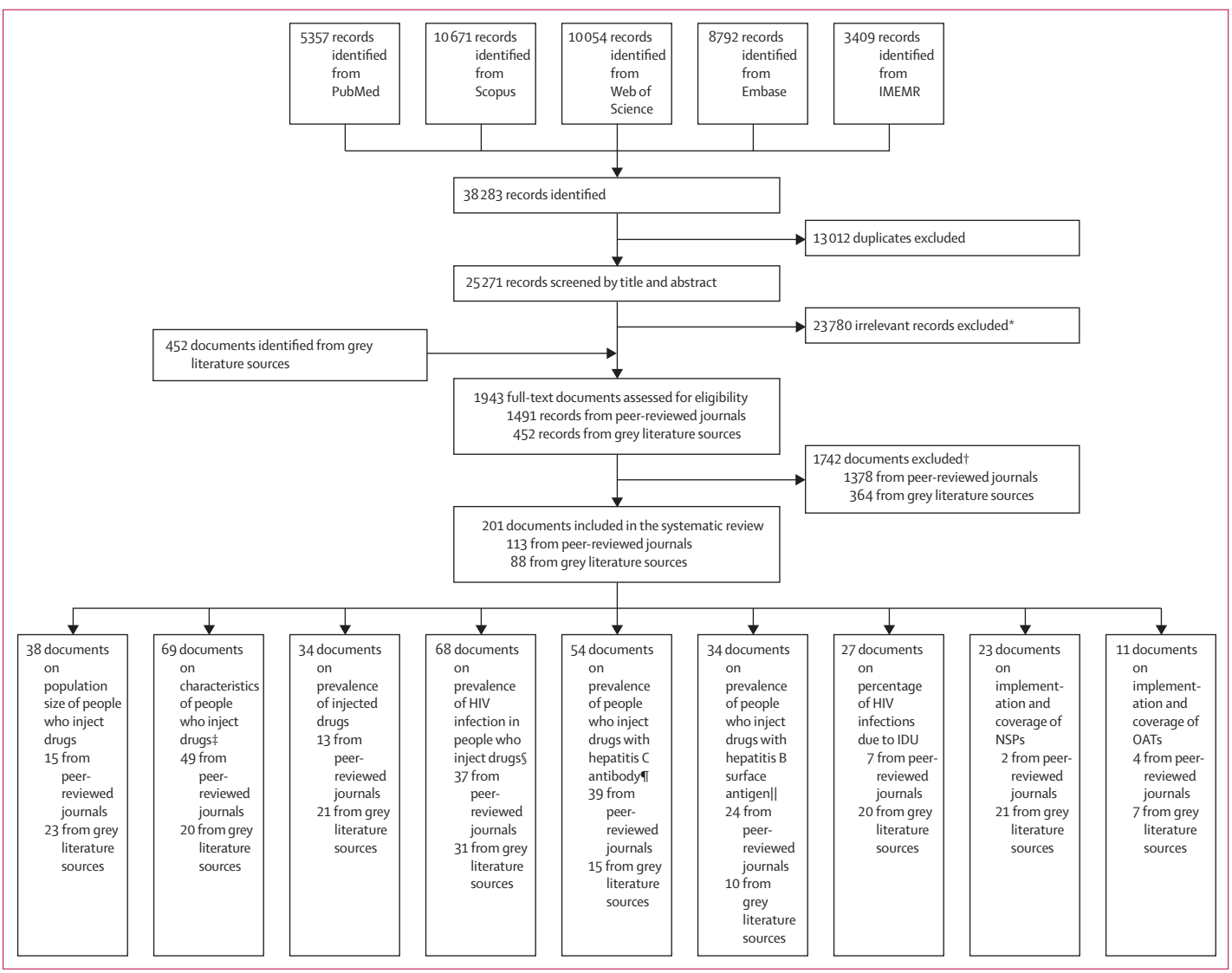

Figure 1: **Selection of studies reporting data for people who inject drugs**
Many of the documents included data for more than one outcome indicator, so numbers shown for each indicator do not add to the total number of documents included in the systematic review. IDU=injecting drug use. IMEMR=Index Medicus for the Eastern Mediterranean Region. NSPs=needle and syringe programmes. OAT=opioid agonist treatment. *Reasons for exclusion were no data for the nine outcomes of interest, containing data for countries outside the Eastern Mediterranean region, containing data pre-dating 2010, and recruiting only students. †Reasons for exclusion were no data for the nine outcomes of interest; prevalence of people who inject drugs measured in a population at high risk (eg, among people who use drugs); prevalence of people who inject drugs measured in a specific population (eg, students); prevalence of HIV, hepatitis C virus, or hepatitis B virus measured in a population of people who inject drugs at high risk (eg, people who inject drugs admitted to infectious disease ward); and subnational data for the percentage of HIV infections due to IDU. ‡69 documents were included in the meta-analysis for all characteristics. §61 documents were included in the meta-analysis. ¶43 documents were included in the meta-analysis. ||31 documents were included in the meta-analysis.

	Year of estimation	Population aged 15–64 years in estimation year	Estimated prevalence of people who inject drugs, n per 10 000 people (95% CI)*	Estimated number of people who inject drugs (95% CI)
North Africa	..	..	14·6 (11·9–20·2)	131 657 (107 179–182 183)
Egypt	2014	55 871 428	17·2 (15·9–22·0)	96 230 (88 834–123 144)
Morocco	2013	22 196 314	8·0 (3·4–14·3)	17 750 (7547–31 741)
Libya	2019	4 572 984	NR (14·6, 8·9–22·5)	6677 (4070–10 289)
Tunisia	2013	7 559 740	14· (8·9–22·5)	11 000 (6728–17 009)
East Africa	..	..	0·5 (0·0–3·5)	2222 (9–16 163)
Djibouti	2019	644 358	0·0	0 (0–0)
Somalia	2019	7 834 386	NR (0·5, 0·0–3·6)	392 (2–92 820)
Sudan	2013	20 186 350	0·5 (0·0–3·6)	986 (4–7267)
Yemen	2019	16 877 312	NR (0·5, 0·0–3·6)	844 (3–6076)
West Asia	..	..	16·6 (10·6–24·8)	73 765 (47 020–110 495)
Iraq	2014	19 638 482	20·0 (13·2–29·0)	39 277 (25 923–56 952)
Jordan	2019	6 318 040	NR (16·6, 10·5–25·0)	10 488 (6634–15 795)
Lebanon	2015	4 333 448	20·8 (13·9–30·0)	9000 (6023–15 795)
Palestine	2012	2 223 568	22·5 (15·3–32·0)	5000 (3402–7115)
Syria†	2012–13	11 994 977	8·3 (4·2–14·7)	10 000 (5038–17 633)
Gulf countries	..	..	7·6 (4·6–13·0)	31 496 (19 081–54 013)
Bahrain	2015	1 053 941	48·4 (37·5–61·5)	5100 (3952–6482)
Kuwait	2014	2 817 690	42·6 (32·4–55·0)	12 000 (9129–15 497)
Oman†‡	2004–16	3 395 398	9·0 (4·7–15·6)	2922 (1596–5297)
Qatar	2019	2 403 888	NR (7·6, 3·7–13·8)	1827 (889–3317)
Saudi Arabia	2017	23 678 403	1·4 (0·2–5·1)	3400 (474–12 076)
The United Arab Emirates	2019	8 220 025	NR (7·6, 3·7–13·8)	6247 (3041–11 344)
South Asia	..	..	33·3 (25·0–44·9)	625 457 (468 620–842 401)
Afghanistan‡	2019	20 889 465	37·0 (27·0–48·0)	57 207 (42 049–75 005)
Iran	2018	56 719 335	24·4 (16·8–34·2)	138 250 (102 662–182 636)
Pakistan‡	2012	110 060 746	40·0 (30·1–52·1)	430 000 (341 188–534 895)
Eastern Mediterranean region	..	431 686 592	20·0 (14·9–27·9)	864 597 (641 909–1 205 255)

NR=not reported. *For countries where no estimate was available, the extrapolated prevalence estimate is given in parentheses before the 95% CI. †The reference document reported a period as the reference time of estimation, so we used the population from the latest year as the denominator. ‡The reference document provided both estimates of population and percentage prevalence of people who inject drugs, so we extracted and tabulated both indicators from the document.

Table 1: **Prevalence and population size estimations for people who inject drugs by country, subregion, and region**

and "drug injection" in English, French, Arabic, and Farsi (appendix 4 p 12). We also hand-searched the reference lists of included documents and personal archives of the research team, including previous systematic reviews of the regional status of drug use.[31,32] Finally, we contacted substance use experts in EMR countries and the mentioned UN bodies for specific documents or data according to retrieved information. We asked experts for any unpublished documents that they were aware of, and if documents had ambiguous or missing data, we asked them to clarify or send details. YR-A searched the online databases for peer-reviewed journals and the grey literature search was done by AMA, AS, YR-A, SO, MA, SB, BS, Maral Mardaneh Jobehdar, and Ghazal Mousavian.

Retrieved records were exported to an Endnote library (version X9) and were screened for eligibility by AMA, AS, YR-A, SO, MA, SB, BS, Maral Mardaneh Jobehdar, and Ghazal Mousavian firstly on the basis of titles and abstracts, followed by full texts (appendix 4 p 13). A document was considered eligible if it had reported or estimated an indicator of interest, or reported enough data to permit the calculation of an indicator of interest. We developed a grading system for literature type (eg, peer-reviewed article or report) and level of evidence (ie, design-related issues reflecting quality of evidence; appendix 4 p 14), adapted from similar reviews,[9,10,27,28,35] and extracted data by use of predesigned forms and according to predetermined decision rules (appendix 4 p 16). Data for each country were extracted by one of the research team members (AMA, AS, YR-A, SO, MA, SB, BS, Maral Mardaneh Jobehdar, and Ghazal Mousavian) and checked by AR-M. Any conflicts in the screening or extraction process were resolved by discussion among the authors until consensus was reached. All eligible documents that met the inclusion criteria were included in the systematic review. We pooled estimates on the basis of predetermined decision rules (pp 19–21).

We grouped the countries into the following five subregions on the basis of geographical proximity and their ethnic, cultural, and economic similarities: north Africa (ie, Egypt, Morocco, Libya, and Tunisia), east Africa (ie, Djibouti, Somalia, Sudan, and Yemen), west Asia (ie, Iraq, Jordan, Lebanon, Palestine, and Syria), Gulf countries (ie, Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates), and south Asia (ie, Afghanistan, Iran, and Pakistan).

Data analysis

The outcomes of interest were the prevalence of IDU; population size of people who inject drugs; characteristics of people who inject drugs, including mean age, sex, proportion of individuals who were illiterate, married, unemployed, homeless at the time of survey, and had a lifetime history of incarceration; most commonly injected drugs; prevalence of HIV, hepatitis C virus, and hepatitis B virus among people who inject drugs; percentage of HIV infections due to IDU; and the implementation and coverage of OAT and NSPs in the EMR countries, subregions, and region, whenever possible. We graded the level of evidence for each estimate of prevalence of IDU, population size of people who inject drugs, characteristics of people who inject drugs, and HIV, hepatitis C, and hepatitis B among people who inject drugs. Documents were graded A–D for quality assessment on the basis of the level of evidence, where grade A represented the highest quality and grade D represented the lowest quality (appendix 4 p 14). We selected the highest-grade national estimate of population size of people who inject drugs found for each country

and calculated the regional and subregional estimates on the basis of the predetermined decision rules (appendix 4 pp 17–18). Whenever we had estimations for more than one country in a subregion, or for one country that contained more than 50% of the population in a subregion, we calculated the subregional estimates as the mean of the prevalence in the countries weighted by the population of each country. We used the subregional estimate for countries without data. For Djibouti, for which existing evidence indicates no known cases of people who inject drugs (before or after 2010), we assumed the prevalence of IDU to be negligible and considered it to be zero. Whenever we had estimations for more than two subregions, the regional estimate was calculated as the mean of the prevalence in the subregions weighted by the population of each subregion.

Regarding characteristics and infection rates of people who inject drugs, we pooled estimates for each country via random-effects meta-analysis (appendix 4 pp 19–21). The number of estimates used in the calculation of each indicator and the related heterogeneity index is shown in appendix 4 (p 22). The subregional and regional estimates were calculated similarly to population size estimates of people who inject drugs, with the exception that the weighting was based on population size of people who inject drugs. We estimated country-level population sizes for people who inject drugs with HIV, hepatitis B, and hepatitis C by multiplying the virus prevalence and prevalence of people who inject drugs by the population of individuals aged 15–64 years in each country. To ensure that the 95% CIs presented for size estimations incorporated both uncertainties of estimations of infection prevalence and prevalence of people who inject drugs, we derived the 95% CIs by use of a Monte Carlo simulation. Subregional and regional population size estimates for people who inject drugs with infections are calculated by summing the constituting country size estimations (appendix 4 pp 19–20).

We extracted data for the most commonly injected drugs and the percentage of national HIV infections due to IDU and provided a qualitative synthesis. We also recorded any information on the availability of OAT and NSPs and national indicators of their coverage among people who inject drugs. We sought to report on the harm-reduction situation in the EMR during the past decade. In line with the recommendations of international agencies, we defined NSP coverage by the number of needles distributed per person who injects drugs per year, with coverage levels of high (ie, >200 needles or syringes), moderate (ie, 100–200 needles or syringes), low (ie, <100 needles or syringes), and very low (<50 needles or syringes). Similarly, we defined OAT coverage by the proportion of people who inject drugs with opioid dependency who received OAT, with coverage levels of high (ie, >40%), moderate (ie, 20–40%), low (ie, <20%), and very low (ie, <10%). All extracted data are shown in appendix 4 (pp 23–55).

The statistical analysis was performed using meta package of R software version 4.0.3.

Role of the funding source

The funder of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report.

Results

We retrieved 38 283 documents with our systematic search. The manual search of relevant systematic reviews and websites provided us with an additional 452 documents. After the screening, 201 documents were included in the systematic review and a total of 115 documents were included in the meta-analyses for the characteristics of people who inject drugs (n=69), the prevalence of HIV infection in people who inject drugs (n=61), the prevalence of people who inject drugs with hepatitis C antibody (n=43), and the prevalence of people who inject drugs with hepatitis B surface antigen (n=31; figure 1).

38 documents provided 54 estimates of the number of people who inject drugs or prevalence of IDU in 20 countries (appendix 4 pp 23–26). Excluding the estimates based on extrapolation, we obtained estimates for 15 countries. For five countries, we selected multi-parameter and indirect estimates (evidence graded A); for one country, we selected a national household estimate (graded B); and lower-grade estimates were used for nine countries. The estimates for six countries were calculated based on extrapolation (table 1). We estimated the total number of people who inject drugs to be 864 597 (95% CI 641 909–1 205 255) for the entire EMR, amounting to 20·0 (95% CI 14·9–27·9) per 10 000 people aged 15 to 64 years. Among subregions, east African countries were estimated to have the lowest prevalence of people who inject drugs, and south Asia was estimated to have the highest (figure 2). Of all people who inject drugs

Figure 2: **Prevalence of injecting drug use**
Prevalence of injecting drug use in the past 12 months per 10 000 people aged 15–64 years in countries of the Eastern Mediterranean region between 2010 and 2022. UAE=United Arab Emirates.

in the EMR, 72% reside in the three south Asian countries (ie, Afghanistan, Iran, and Pakistan).

Through the systematic review, we identified 69 documents reporting on the sociodemographic profile of people who inject drugs from 68 studies in 13 countries (appendix 4 pp 27–31). Overall, 97·7% (95% CI 95·8–99·0) of people who inject drugs in the region were men and 2·3% (1·0–4·2) were women. Subregional estimates were mostly similar to the regional estimate for mean age, ratio of men to women, and marital status of people who inject drugs; however, there were considerable subregional differences in illiteracy and unemployment. There were sufficient data to provide a subregional estimate for current homelessness in south Asia. South Asia and north Africa were the only subregions with enough data to estimate

	Estimated number of people who inject drugs	Number of surveys recruiting people who inject drugs	Mean age, years (95% CI)	Proportion of men, % (95% CI)	Proportion of women, % (95% CI)	Proportion who were married at time of study, % (95% CI)	Illiterate at time of study, % (95% CI)	Unemployed at time of study, % (95% CI)	Homeless at time of study, % (95% CI)	Ever incarcerated, % (95% CI)	Most common drug of injection
North Africa	131 657	17	33·5 (29·9–37·2)	97·0% (94·4–98·9)	3·0% (1·1–5·6)	32·1% (22·5–42·3)	23·1% (18·5–28·0)	55·8% (50·0–61·4)	NR	80·3% (74·1–85·5)	NR
Egypt	96 230	3	32·2 (27·9–36·5)	97·0% (94·7–98·8)	3·0% (1·2–5·3)	36·3% (24·8–48·6)	28·0% (22·8–33·4)	55·1% (49·2–60·9)	NR	NR (80·3%, 75·1–84·8)	NR
Morocco	17 750	7	38·9 (38·1–39·6)	97·1% (93·9–99·2)	2·9% (0·8–6·1)	19·6% (17·4–21·8)	9·8% (6·1–14·3)	NR (55·8%, 48·9–62·5)	5·5% (4·0–7·2)	80·3% (74·5–85·1)	Heroin
Libya	6677	1	NR (33·5, 29·9–37·2)	98·7% (97·2–99·7)	1·3% (0·3–2·8)	12·1% (8·9–16·0)	NR (23·1%, 18·6–28·0)	NR (55·8%, 50·2–61·2)	NR	NR (80·3%, 75·6–84·5)	Buprenorphine
Tunisia	11 000	6	36·4 (34·0–38·9)	96·1% (91·2–98·9)	3·9% (1·1–8·8)	27·1% (18·5–36·5)	1·7% (1·0–2·9)	61·8% (59·6–64·0)	NR	80·4% (63·9–92·8)	Buprenorphine
East Africa	2222	0	NR (32·7, 31·3–34·2)	NR (97·7%, 94·5–99·3)	NR (2·3%, 0·7–5·5)	NR (39·5%, 32·7–46·7)	NR (33·0%, 26·5–40·0)	NR (33·9%, 27·4–40·9)	NR	NR	NR
Djibouti	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA
Somalia	392	0	NR (32·7, 31·3–34·2)	NR (97·7%, 94·5–99·3)	NR (2·3%, 0·7–5·5)	NR (39·5%, 32·7–46·7)	NR (33·0%, 26·5–40·0)	NR (33·9%, 27·4–40·9)	NR	NR	NR
Sudan	986	0	NR (32·7, 31·3–34·2)	NR (97·7%, 94·5–99·3)	NR (2·3%, 0·7–5·5)	NR (39·5%, 32·7–46·7)	NR (33·0%, 26·5–40·0)	NR (33·9%, 27·4–40·9)	NR	NR	NR
Yemen	844	0	NR (32·7, 31·3–34·2)	NR (97·7%, 94·5–99·3)	NR (2·3%, 0·7–5·5)	NR (39·5%, 32·7–46·7)	NR (33·0%, 26·5–40·0)	NR (33·9%, 27·4–40·9)	NR	NR	NR
West Asia	73 765	8	33·7 (32·5–34·8)	97·6% (95·1–99·2)	2·4% (0·8–4·9)	35·4% (28·6–42·8)	17·5% (13·2–22·6)	27·9% (19·3–37·4)	NR	NR	NR
Iraq	39 277	0	NR (33·7, 32·5–34·8)	NR (97·6%, 94·7–99·2)	NR (2·4%, 0·8–5·3)	NR (35·4%, 29·2–41·9)	NR (17·5%, 12·9–23·0)	NR (27·9%, 22·2–34·1)	NR	NR	Prescription drugs
Jordan	10 488	1	NR (33·7, 32·5–34·8)	97·0% (94·5–99·1)	3·0% (0·9–5·5)	36·0% (29·7–42·5)	19·0% (14·1–24·7)	14·0% (9·6–19·0)	NR	NR	Heroin
Lebanon	9000	3	31·8 (31·0–32·6)	97·4% (95·3–98·9)	2·6% (1·1–4·7)	19·5% (7·4–35·4)	22·7% (18·7–27·0)	44·1% (11·6–80·0)	NR	75·2% (70·8–79·4)	Heroin
Palestine	5000	3	40·3 (38·2–42·3)	99·2% (97·7–99·9)	0·8% (0·1–2·3)	62·8% (56·2–69·1)	5·0% (2·4–8·6)	NR (27·9%, 21·8–34·7)	NR	NR	Heroin
Syria	10 000	1	32·1 (31·1–33·1)	NR (97·6%, 95·6–98·9)	NR (2·4%, 1·1–4·4)	NR (35·4%, 30·7–40·3)	NR (17·5%, 13·9–21·6)	NR (27·9%, 23·5–32·6)	NR	NR	Heroin
Gulf countries	31 496	3	33·3 (32·2–34·5)	NR (96·3%, 94·1–97·8)	NR (3·7%, 2·2–5·9)	NR (39·8%, 35·3–44·5)	NR (29·5%, 25·5–31·9)	NR (36·2%, 29·4–38·6)	NR	NR	NR
Bahrain	5100	0	NR (32·7, 31·3–34·2)	NR (97·7%, 95·6–99·0)	NR (2·3%, 1·0–4·4)	NR (39·5%, 34·5–44·6)	NR (33·0%, 28·3–38·0)	NR (33·9%, 29·1–38·9)	NR	NR	Heroin
Kuwait	12 000	1	32·3 (31·4–33·2)	93·9% (91·6–95·8)	6·1% (4·2–8·4)	NR (39·5%, 35·3–43·8)	NR (33·0%, 29·0–37·2)	NR (33·9%, 29·8–38·1)	NR	NR	Heroin
Oman	2922	0	NR (32·7, 31·3–34·2)	NR (97·7%, 95·6–99·0)	NR (2·3%, 1·0–4·4)	NR (39·5%, 34·5–44·6)	NR (33·0%, 28·3–38·0)	NR (33·9%, 29·1–38·9)	NR	NR	Heroin
Qatar	1827	0	NR (32·7, 31·3–34·2)	NR (97·7%, 95·6–99·0)	NR (2·3%, 1·0–4·4)	NR (39·5%, 34·5–44·6)	NR (33·0%, 28·3–38·0)	NR (33·9%, 29·1–38·9)	NR	NR	NR
Saudi Arabia	3400	2	40 (39·1–40·9)	NR (97·7%, 95·5–99·0)	NR (2·3%, 1·0–4·5)	42·7% (39·1–46·5)	0·8% (0·1–2·0)	54·8% (27·8–80·4)	NR	NR	NR
United Arab Emirates	6247	0	NR (32·7, 31·3–34·2)	NR (97·7%, 95·6–99·0)	NR (2·3%, 1·0–4·4)	NR (39·5%, 34·5–44·6)	NR (33·0%, 28·3–38·0)	NR (33·9%, 29·1–38·9)	NR	NR	Heroin

(Table 2 continues on next page)

	Estimated number of people who inject drugs	Number of surveys recruiting people who inject drugs	Mean age, years (95% CI)	Proportion of men, % (95% CI)	Proportion of women, % (95% CI)	Proportion who were married at time of study, % (95% CI)	Illiterate at time of study, % (95% CI)	Unemployed at time of study, % (95% CI)	Homeless at time of study, % (95% CI)	Ever incarcerated, % (95% CI)	Most common drug of injection
(Continued from previous page)											
South Asia	625 457	65	32·4 (31·4–33·5)	97·8% (96·2–99·1)	2·2% (0·9–3·8)	41·5% (34·5–48·7)	37·2% (26·9–47·8)	30·0% (15·1–47·6)	34·1% (19·3–51·2)	60·0% (54·2–69·7)	NR
Afghanistan	57 207	4	32·2 (30·5–33·9)	99·3% (98·7–99·6)	0·7% (0·4–1·3)	46·4% (38·9–54·0)	55·6% (46·4–64·5)	3·7% (0·1–11·2)	NR (34·1%, 30·4–38·0)	48·1% (36·0–60·0)	Heroin and tranquilizers
Iran	138 250	40	35·7 (33·9–37·5)	94·6% (90·3–97·7)	5·4% (2·3–9·7)	37·1% (29·2–45·4)	8·4% (5·3–12·2)	33·4% (22·4–45·3)	39·5% (29·6–49·7)	73·8% (70·1–77·4)	Heroin
Pakistan	430 000	21	31·4 (30·7–32·1)	98·8% (97·8–99·5)	1·2% (0·5–2·2)	42·3% (35·6–49·1)	44·0% (31·3–57·0)	32·4% (14·7–53·2)	32·4% (14·5–53·5)	57·1% (48·8–65·3)	Heroin and pheniramine
Eastern Mediterranean region	864 597	93	32·7 (31·3–34·2)	97·7% (95·8–99·0)	2·3% (1·0–4·2)	39·5% (32·2–47·1)	33·0% (24·4–42·0)	33·9% (21·3–48·7)	NR	NR	NR

For countries where no estimate was available for an indicator, an extrapolated estimation was calculated and is given in parentheses before the 95% CI. The subregional estimates that could not be derived from country-level estimates were calculated after extrapolating regional estimates to the countries of that subregion, and are presented in parenthesis after NR. We could not calculate extrapolated estimations with the described method for the whole region and some subregions for indicators of homelessness and incarceration due to scarcity of data. NA=not applicable. NR=not reported.

Table 2: **The estimated number of people who inject drugs, pooled and extrapolated estimates of people who inject drugs characteristics, and most common drug of injection by country, subregion, and region**

the history of incarceration among people who inject drugs. There were 34 documents from 15 countries with data for drugs of injection (appendix 4 pp 32–34; table 2). Heroin was the most commonly injected drug in all subregions except north Africa, in which buprenorphine seemed to be the most common drug, and west Asia, in which prescription drugs seemed to be the most common drugs.

Updated data for HIV transmission routes and the contribution of IDU were available for 21 countries (appendix 4 pp 35–36). People who inject drugs accounted for more than 40% of people with HIV in Afghanistan, Bahrain, Iran, and Libya; 20–40% in Egypt, Pakistan, and Tunisia; and less than 20% for the other 14 countries. We found 90 estimates for HIV prevalence from 15 countries (appendix 4 pp 37–40). For the whole EMR, we estimated an HIV prevalence of 19·22% (95% CI 12·86–26·36) among people who inject drugs, meaning that 171 561 (95% CI 103 322–255 441) of people who inject drugs live with HIV in this region. West Asia and east Africa had the lowest prevalence of HIV among people who inject drugs, and south Asia had the highest prevalence (table 3). The highest number of people who inject drugs living with HIV were estimated to reside in south Asia (appendix 4 p 68).

We found 78 estimates on prevalence of people who inject drugs with hepatitis C virus antibodies for 13 countries (appendix 4 pp 41–44). For the entire EMR, the prevalence of hepatitis C virus was estimated at 44·82% (95% CI 29·32–61·16) among people who inject drugs, with 397 675 (95% CI 225 748–600 310) people who inject drugs living with hepatitis C virus. Among subregions, the lowest prevalence was estimated for west Asia and east Africa, and the highest prevalence was estimated for north Africa. The highest number of people who inject drugs with hepatitis C virus was estimated to be in south Asia (appendix 4 p 68).

We also found 40 estimates of hepatitis B virus prevalence among people who inject drugs for 11 countries (appendix 4 pp 45–46). For the whole EMR, the prevalence of hepatitis B virus was estimated at 2·66% (95% CI 0·84–7·26) among people who inject drugs, with 23 750 (95% CI 6244–53 779) people who inject drugs testing positive for hepatitis B antigen. West Asia and east Africa had the lowest prevalence, and north Africa had the highest prevalence. However, the greatest number of people who inject drugs with hepatitis B virus resided in south Asia (appendix 4 p 68).

Between 2010 and 2022, nine of 22 countries provided NSPs at some point in time to people who inject drugs (appendix 4 pp 47–48). Iran had the most extensive programme, followed by Pakistan and Tunisia. The proportion of people who inject drugs who were estimated to have received needles and syringes in the past year was lowest in Lebanon and highest in Iran. The number of needles and syringes distributed per person who injects drugs per year was lowest in Tunisia and highest in Morocco. Based on the number of needles and syringes distributed per people who inject drugs per year, Morocco has moderate coverage, Afghanistan has low coverage, and Iran, Pakistan, and Tunisia have very low coverage of NSPs (table 4; appendix 4 p 69).

During the past decade, opioid agonist treatment in some form existed in seven countries at some point in time (appendix 4 pp 49–50; table 4). Iran had the most extensive service provision, followed by Afghanistan and Morocco. Of the countries with available data for

	Estimated number of people who inject drugs	Estimated prevalence of HIV infection in people who inject drugs, % (95% CI)	Estimated number of people who inject drugs living with HIV (95% CI)	Estimated prevalence of people who inject drugs with hepatitis C antibody, % (95% CI)	Estimated number of people who inject drugs with hepatitis C virus antibody (95% CI)	Estimated prevalence of people who inject drugs with hepatitis B surface antigen, % (95% CI)	Estimated number of people who inject drugs with hepatitis B virus (95% CI)
North Africa	131 657	8·12% (6·11–10·77)	12 531 (6808–19 618)	58·18 (51·69–64·43)	76 548 (55 818–100 271)	4·37% (2·07–8·40)	5749 (2374–10 426)
Egypt	96 230	3·73% (2·13–5·71)	5430 (3026–8290)	NR (58·18%, 52·12–64·06)	55 911 (45 251–67 557)	NR (4·37%, 2·28–7·50)	4198 (1975–6864)
Morocco	17 750	5·05% (1·02–11·67)	896 (154–2163)	63·13 (50·78–74·67)	11 220 (5009–18 891)	NR (4·37%, 2·06–8·02)	776 (264–1528)
Libya	6677	87·10% (83·35–90·61)	5814 (3432–8514)	94·20 (91·39–96·50)	6290 (3743–9192)	4·50% (2·40–7·01)	301 (135–532)
Tunisia	11 000	3·54% (2·23–5·10)	391 (196–651)	28·32 (25·23–31·52)	3127 (1815–4631)	4·30% (0·00–17·73)	474 (0–1502)
East Africa	2222	NR (0·01%, 0·00–2·00)	0 (0–3)	NR (18·86%, 13·70–25·00)	425 (0–1722)	NR (1·89%, 0·49–4·90)	42 (0–198)
Djibouti	0	NA	NA	NA	NA	NA	NA
Somalia	392	NR (0·01%, 0·00–2·00)	0 (0–1)	NR (18·86%, 13·70–25·00)	74 (0–301)	NR (1·89%, 0·49–4·90)	7 (0–35)
Sudan	986	NR (0·01%, 0·00–2·00)	0 (0–1)	NR (18·86%, 13·70–25·00)	191 (0–774)	NR (1·89%, 0·49–4·90)	19 (0–89)
Yemen	844	NR (0·01%, 0·00–2·00)	0 (0–1)	NR (18·86%, 13·70–25·00)	160 (0–647)	NR (1·89%, 0·49–4·90)	16 (0–74)
West Asia	73 765	0·01% (0·00–0·34)	9 (0–131)	18·86% (14·36–24·04)	13 912 (8208–20 879)	1·89% (0·71–4·16)	1081 (266–2447)
Iraq	39 277	NR (0·01%, 0·00–0·33)	4 (0–40)	NR (18·86%, 14·04–24·50)	7406 (4348–11 134)	NR (1·98%, 0·56–4·59)	741 (148–1633)
Jordan	10 488	0·00% (0·00–0·34)	0 (0–31)	NR (18·86%, 13·85–24·75)	1976 (1100–3076)	NR (1·98%, 0·52–4·75)	198 (37–449)
Lebanon	9000	0·05% (0·00–0·60)	5 (0–25)	23·59% (17·82–29·89)	2127 (1285–3159)	1·07% (0·35–2·10)	96 (30–190)
Palestine	5000	0·00% (0·00–0·30)	0 (0–15)	41·48% (37·13–45·89)	2075 (1355–2883)	6·15% (4·15–8·48)	308 (174–475)
Syria	10 000	0·00% (0·00–0·22)	0 (0–20)	3·30% (1·73–5·32)	328 (120–627)	0·50% (0·01–1·52)	50 (0–137)
Gulf countries	31 496	1·32% (0·46–2·85)	415 (125–956)	37·67% (22·56–70·55)	11 854 (3205–23 952)	3·43% (1·77–7·03)	1080 (266–2447)
Bahrain	5100	3·89% (2·00–6·30)	199 (98–324)	NR (37·67%, 32·77–42·77)	1921 (1426–2475)	NR (3·43%, 1·84–5·80)	175 (83–289)
Kuwait	12 000	0·10% (0·00–0·39)	12 (0–34)	30·87% (1·48–75·19)	3692 (0–8785)	1·52% (0·00–7·21)	182 (0–579)
Oman	2922	0·53% (0·24–0·93)	15 (6–32)	36·56% (21·52–53·09)	1117 (458–2036)	6·29% (4·96–7·76)	192 (89–319)
Qatar	1827	NR (1·32%, 0·43–3·05)	24 (5–55)	NR (37·67%, 32·77–42·77)	688 (304–1153)	NR (3·43%, 1·84–5·80)	63 (22–124)
Saudi Arabia	3400	2·46% (0·07–7·54)	82 (0–321)	62·61% (30·49–89·53)	2083 (0–5537)	7·70% (5·19–10·59)	255 (0–707)
United Arab Emirates	6247	NR (1·32%, 0·43–3·05)	82 (16–190)	NR (37·67%, 32·77–42·77)	2353 (1017–3966)	NR (3·43%, 1·84–5·80)	214 (72–429)
South Asia	625 457	24·79% (16·46–33·96)	158 606 (96 389–234 733)	45·53% (26·78–64·49)	394 936 (158 517–453 486)	2·35% (0·55–7·41)	15 485 (3215–37 824)
Afghanistan	57 207	1·41% (0·15–3·60)	1091 (0–2441)	23·08% (9·08–41·04)	17 854 (6808–31 607)	2·77% (1·16–4·98)	2141 (851–3791)
Iran	138 250	8·30% (6·00–10·80)	11 496 (6976–17 039)	36·80% (30·84–42·98)	50 962 (33 189–71 398)	3·04% (1·97–4·30)	4207 (2364–6594)
Pakistan	430 000	33·20% (22·00–45·45)	146 018 (89 413–215 253)	51·32% (27·82–74·53)	226 120 (118 520–350 481)	2·08% (0·00–8·73)	9137 (0–27 439)
Eastern Mediterranean region	864 597	19·22% (12·86–26·36)	171 561 (103 322–255 441)	44·82% (29·32–61·16)	397 675 (225 748–600 310)	2·66% (0·84–7·26)	23 750 (6244–53 779)

For countries where no estimate was available for an indicator, an extrapolated estimation was calculated and is given in parentheses before the 95% CI. The subregional estimates that could not be derived from country-level estimates were calculated after extrapolating regional estimates to the countries of that subregion, and presented in parenthesis after NR. NA=not applicable. NR=not reported.

***Table 3*: Estimated number and prevalence of HIV, hepatitis B virus, and hepatitis C virus among people who inject drugs by country, subregion, and region**

coverage, Iran had moderate coverage of OAT, and Afghanistan and Morocco had very low coverage (appendix 4 p 69).

Among all retrieved estimates for HIV infection among people who inject drugs, 44 (48·9%) of 90 were graded A or B for level of evidence. For hepatitis C virus, 49 (62·8%) of 78 estimates were graded A or B. For hepatitis B virus, 20 (50·0%) of 40 estimates were graded A or B (appendix 4 pp 37–46). For characteristics of people who inject drugs, 45 (66·2%) of 68 studies were graded A or B. For IDU prevalence, 22 (40·7%) of 54 estimates were graded A or B. The results of the meta-analysis for most indicators in most countries showed a high level of heterogeneity (appendix 4 p 22).

Discussion

Our review included 201 relevant documents in 22 countries of the EMR and provides new estimations where possible. Previous reviews differed in their geographical coverage, search timeframe and protocol, and extrapolation methods (if used). Although their findings cannot be directly compared, the estimates provided by different regional studies in the past decade seem to converge on roughly similar numbers, with all the previous estimates of population size for people who inject drugs falling between 626 000 and 887 000, and IDU prevalence among the general population between 22 people who inject drugs per 10 000 adults and 24 people who inject drugs per 10 000 adults.[28–31] We estimated that

	Estimated number of people who inject drugs	Availability of OAT	Number of OAT centres	Medicine used for OAT	Proportion and coverage of people who inject drugs receiving OAT (%)	Availability of NSPs	Number of NSP centres	Proportion of people who inject drugs who received needles or syringes in past year, %	Number and coverage of needles or syringes distributed per people who inject drugs per year
North Africa	131 657	..	..	..	..	..	..	..	..
Egypt	96 230	No	NA	NA	NA	Yes	NR	NR	NR
Morocco	17 750	Yes	7	Methadone	(2·4%, very low)	Yes	6	(5·1%)	109 (moderate)
Libya	6677	No	NA	NA	NA	No	NA	NA	NA
Tunisia	11 000	No	NA	NA	NA	Yes	25	NR	41 (very low)
East Africa	2222	..	..	..	..	..	..	..	..
Djibouti	0	No	NA	NA	NA	No	NA	NA	NA
Somalia	392	No	NA	NA	NA	No	NA	NA	NA
Sudan	986	No	NA	NA	NA	No	NA	NA	NA
Yemen	844	No	NA	NA	NA	No	NA	NA	NA
West Asia	73 765	..	..	..	..	..	..	..	..
Iraq	39 277	No	NA	NA	NA	No	NA	NA	NA
Jordan	10 488	Planned for OAT	NA	NA	NA	Yes	10	(3·7%)	NR
Lebanon	9000	Yes	Several*	Buprenorphine	NR	Yes	NR	(2·1%)	NR
Palestine	5000	Yes	1	Methadone and buprenorphine	NR	Yes	2	45·0%	NR
Syria	10 000	No	NA	NA	NA	No	NA	NA	NA
Gulf countries	31 496	..	..	..	..	..	..	..	..
Bahrain	5100	No	NA	NA	NA	No	NA	NA	NA
Kuwait	12 000	Yes	1	Buprenorphine	NR	No	NA	NA	NA
Oman	2922	Planned for buprenorphine maintenance therapy	NA	NA	NA	No	NA	NA	NA
Qatar	1827	No	NA	NA	NA	No	NA	NA	NA
Saudi Arabia	3400	No	NA	NA	NA	No	NA	NA	NA
United Arab Emirates	6247	Yes	1	Buprenorphine	NR	No	NA	NA	NA
South Asia	625 457	..	..	..	..	..	..	..	..
Afghanistan	57 207	Yes	10 (including 4 prison centres)	Methadone	2·0% (very low)	Yes	NR	30·0%	50 (low)
Iran	138 250	Yes	7345 (including 120 prison centres)	Methadone, buprenorphine, and opium tincture	25·0% (moderate)	Yes	280	87·9%	48 (very low)
Pakistan	430 000	Planned for buprenorphine maintenance therapy	NA	NA	NA	Yes	34	(10·1%)	46 (very low)
Eastern Mediterranean region	864 597	..	..	..	..	..	..	..	..

The percentages presented in parentheses are calculated by dividing the available crude number by the best-estimated population size of people who inject drugs in the country. NA=not applicable. NR=not reported. NSP=needle and syringe programme. OAT=opioid agonist treatment. *We did not find any evidence of the exact number of centres.

Table 4: **Availability of OAT and NSPs and their coverage indicators by country, subregion, and region**

there are 864 597 people who inject drugs in the region, equating to 20·0 people who inject drugs per 10 000 adults, which is slightly lower than the global estimate of 29 per 10 000 people in the latest international systematic review[10] but closer to the world drug report of 22 per 10 000 adults in 2020.[11] The lower prevalence of IDU estimated in our study might be partly due to the much lower injection rates among women in the EMR compared with global estimates. Our data consistently show that women constitute a low proportion of people who inject drugs across the region, largely below 3%. The only available global review with information on IDU in EMR countries has also estimated the proportion to be 3·4%, which is far below the estimated global mean of around 22%. A global systematic review concluded that a higher proportion of women who inject drugs exists in high-income countries than in low-income and middle-income countries.[10] However, our findings of the

low prevalence of women who inject drugs across all subregions, regardless of economic indices, might suggest the importance of the sociocultural environment as well as economic status. Engagement of women who inject drugs in treatment or research might be challenging, as is evident by the high prevalence of studies that included only men. There is an uneven distribution of people who inject drugs throughout the region. The south Asian countries had by far the highest number of people who inject drugs, followed by north Africa. Notably, due to methodological differences, our estimations of the population size of people who inject drugs for some countries are considerably different from estimates for similar indicators provided by international agencies.[11,36] The most impactful variations in our methods included choosing the estimate with the highest quality in the 2010–22 period rather than the most recent estimate, calculating the national people who inject drugs population size estimate when the highest quality study was limited to a gender or a geographical area within a country, and relying only on published documents rather than expert opinions (appendix 4 pp 17–18).

Based on our findings, the prevalence of HIV among people who inject drugs was 19·22%. Globally, it has been estimated that 12·4–15·2% of people who inject drugs are living with HIV.[10,11] Several systematic reviews have been conducted on the prevalence of HIV among people who inject drugs in the EMR between years 2005 and 2020;[28,29,31,32,37] however, few of them have provided an overall estimate for the region, and those that have range from 15% to 23·5%.[31,32] Notably, the heterogeneity of countries and subregions should be considered in the interpretation of the 19·22% regional prevalence of HIV estimated in this Article. A notable difference exists in infection rates, and the pooled estimate is not generalisable to all subregions and countries. Our findings are in line with the latest review describing the situation and trends of HIV infection among key populations,[33] indicating that most of the countries in south Asia and north Africa have concentrated levels (ie, prevalence of ≥5%) of HIV among people who inject drugs, with Iran and Pakistan reaching consistent endemic levels. Similarly to this review, our findings also indicated that most of the countries in west Asia have low prevalence of HIV among people who inject drugs.[33]

We identified that approximately half (44·82%) of people who inject drugs were hepatitis C virus antibody-positive and around 2·66% were hepatitis B virus antigen-positive in the region. The hepatitis C virus rate among people who inject drugs has been estimated as ranging from 48·9% to 52·5% and the hepatitis B virus infection rate as ranging from 7·9% to 8·4% worldwide.[10,11] Based on WHO estimation, 23% of new hepatitis C virus infections in 2015 were attributable to IDU.[38] Moreover, people with recent IDU comprised an estimated 8·5% of all hepatitis C virus infections globally.[35] Previous reviews estimated similar rates of hepatitis C virus among people who inject drugs in the EMR, reporting a median prevalence of 44% up to 2013[29] and a pooled prevalence of 49·3% up to 2018.[30]

Evidence supports the effectiveness of NSPs and OAT in decreasing the burden of IDU.[24,25] However, 15 EMR countries have not yet implemented any OAT programmes, including Pakistan, the country where most people who inject drugs in the EMR reside. Moreover, few OAT centres exist in Afghanistan, Kuwait, Morocco, Palestine, and the United Arab Emirates. Given that most OAT services require daily visits, the sparsity of centres can seriously compromise service, even in countries with small populations.[39,40] Iran has an extensive programme, with more than 1 million people with opioid use disorder receiving OAT, although only a small proportion are people who inject drugs. Afghanistan, Morocco, and Lebanon each have around 2000 people receiving OAT, and few individuals receive OAT in Palestine, Kuwait, and the United Arab Emirates.[31] The nature and extent of barriers to the provision of OAT differ across countries. For example, in Lebanon and Morocco, the number of centres and qualified staff need to be increased.[41–43] The main challenges in Iran are supervising the large number of centres, ensuring service quality, and providing services to people who cannot afford treatment in the private sector.[31,32] Countries without OAT have reported barriers to implementing OAT, such as a zero-tolerance governmental policy with opioids and concerns about or past experiences of the diversion of opioid agonists to the black market.[44,45]

Similarly, only nine countries in the region had NSPs at some point during 2010–22, and even in these countries, data for the number of centres and coverage were scarce. Most countries reported a very low or low coverage. Some countries with a high prevalence of people who inject drugs do not provide any NSP service. NSPs were implemented in Oman for some time before 2010, but available data suggest that the programmes have stopped.[31,46,47] Services were expanded in Iran, Pakistan, and Palestine in the early 2010s, but there is evidence of scaling down in Pakistan.[31,32] Jordan started an NSP in five governorates in 2013, which later expanded to include ten governorates.[31] Insufficient funding and political commitment, institutional support, complex bureaucratic approval processes, stigma and criminalisation of drug use, and security issues have been the main challenges limiting the provision of NSPs to people who inject drugs.[31,32]

Despite our extensive efforts to identify relevant documents, no data were discovered on many variables from Bahrain, Iraq, Qatar, Somalia, Sudan, Yemen, and the United Arab Emirates. The gaps in data have several potential causes. There is a history of reluctance among the region's political leaders to acknowledge and address issues concerning people who inject drugs.[48,49] Furthermore, investigations of populations who inject

drugs are highly dependent on international funding and technical assistance. International funding bodies rarely fund investigations in high-income countries, such as the Gulf countries, and do not prioritise middle-income countries, affecting research and services targeting people who inject drugs in many EMR countries.[50] Additionally, long-term political, social, and economic turmoil might have led stakeholders to deprioritise IDU.

This Article has some notable limitations. There is a wide variety in the publication sources of data for each indicator. Although most data for infection rates and characteristics of people who inject drugs are from peer-reviewed sources, the data for size estimations, harm reduction services, and percentage of HIV infections due to IDU is mostly based on documents from grey literature. Furthermore, since our search syntax was mainly focused on drug use, there is a small probability that we have missed a few documents on HIV and hepatitis related to drug use. Moreover, most of the included studies had a sample limited to men or that included few women. This imbalance could be mainly due to the lower prevalence of IDU among women in this region compared with the global mean, but it is also plausible to assume that the failure of studies to engage women and women's under-representation in the treatment facilities could also have a role. The widely heterogenous operational definition of people who inject drugs and their characteristics was another challenge. Additionally, some studies provided incomplete information about their methods, limiting our quality assessment. Some limitations are due to the estimation generation methods that we used. Regarding size estimations of the population of people who inject drugs with different infections, since the age-specific data were not available, we simply multiplied by the overall population size of individuals aged 15–64 years, which ignores important variability in age-specific prevalence that exists across most settings. We provided estimates for some countries on the basis of extrapolation, which is subject to shortcomings and should be interpreted with caution. Lastly, our grey literature search with Arabic and French keywords was not as sensitive as our search in English.

According to the available data, the prevalences of IDU in the general population and hepatitis B virus and hepatitis C virus among people who inject drugs in the region are lower than the global average, whereas HIV prevalence among people who inject drugs is higher than the global estimates. Although this indicates the necessity of harm reduction services, such services are underdeveloped across much of the region. IDU appears to be a largely neglected health problem in most of the 22 countries in the EMR, and a considerable information gap exists, especially in east Africa and Gulf subregions. Moreover, the complicated dynamics of IDU in the region are constantly changing and might have been affected by the various new or ongoing political and social instabilities, the COVID-19 pandemic, and policy shifts, which might not be captured yet. Therefore, consistent country-level data production and future longitudinal regional assessments are required. International agencies, non-governmental organisations, and regional and local experts should collectively advocate for the needs of this highly marginalised group to convince policy makers and other stakeholders in the countries to invest in research and service provision targeting people who inject drugs.

Contributors

AR-M conceived the scope and concept of the review in consultation with KS and MT. Screening, review, and data extraction were done by AMA, BS, AS, YR-A, SO, MA, and SB. AR-M oversaw the screening process and verified the extracted data. The approach to the selection and pooling of all data was developed and agreed on by AR-M, JG, YR-A, and AMA. Data analysis and estimate generation was done by AMA and was supervised by JG. Maps were generated by AMA and SB. AMA, AS, YR-A, and AR-M drafted the first iteration of the manuscript. All authors made substantial contributions to the critical review, editing, and revision of the manuscript. All authors had full access to all the data in the study and had final responsibility for the decision to submit for publication. AR-M and AMA accessed and verified the underlying data reported in this study.

Declaration of interests

We declare no competing interests.

Data sharing

The full search strategy and all the data used to generate the results presented in this systematic review can be found in the supplementary materials.

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