Chapter 6
Patterns and Epidemiology of Illicit Drug Use Among Sex Workers Globally: A Systematic Review

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Introduction

Potential harms associated with illicit drug use in the context of sex work include increased vulnerability to: infectious disease such as HIV and other sexually transmitted infections (STI), violence, stigma and discrimination, criminalisation, and exploitation [1–10]. For example, both illicit and licit drug use have been associated with increased exposure to violence against sex workers. The perpetrators of this violence include clients, police, and strangers, and the violence occurs in a range of settings [11, 12]. An early US study found that injecting heroin and trading sex at a crack house were significantly associated with client-perpetrated violence [13]. A Russian study observed that recent injection drug use was significantly associated with police-perpetrated sexual violence against sex workers [14], and in China sex workers who reported drug use were more likely than those who did not report violence by clients [15]. However, major gaps remain in the

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S. M. Goldenberg et al. (eds.), *Sex Work, Health, and Human Rights*,
https://doi.org/10.1007/978-3-030-64171-9_6

epidemiological data on violence and other health and social inequities faced by sex workers who use drugs. In particular, limited data exist about male and transgender sex workers.

Sex workers who use drugs face unique challenges as a population experiencing health and human rights inequities. No country in the world has decriminalised both drug use and sex work, and people who use drugs and sell sex remain globally criminalised [16]. Legal and regulatory environments in which people who sell sex and use drugs are criminalised promote stigmatisation and discrimination [5]. Mathematical modelling by Shannon et al. [4] indicated that decriminalising sex work could significantly reduce HIV, averting 33–46% of HIV infections globally through reduced violence and police harassment, and access to safe work environments. A recent analysis of data from 27 European countries found that countries where sex work is fully or partly legalised had a lower burden of HIV among female sex workers than countries where sex work was criminalised [17]. Not only is decriminalisation supported by the WHO, the United Nations, and the Global Commission on HIV and Law [16, 18, 19], but, as Shannon et al. [5] have noted, "The criminalisation of sex work continues to provide cover and sanction to state-sponsored human rights abuses against sex workers and sex worker human rights defenders" [5]. Most recently, a range of countries including Canada, France, and Ireland have introduced end-demand or Nordic model criminalisation laws [5]. While data on this regulatory model are scarce, some evidence suggests that it produces harm similar to full criminalisation [20–22].

Although the prevalence of drug use among sex workers is generally believed to be higher than in the general population, the literature is dominated by studies of street-based sex workers, particularly ciswomen, many of whom engage in sex work to support their drug use. Street-based sex workers often have complex health and social needs due to high prevalence of heroin, cocaine, and injection drug use, poor treatment outcomes, high levels of morbidity and mortality, including mental and physical health outcomes, and exposure to sexual and physical violence and homelessness. Less is known about drug use among other sub-groups of sex workers, including those who work in settings such as bars and clubs, massage parlours and private homes [23], or among non-street-based male or transgender sex workers. Functional or occupational drug use by sex workers, including alcohol and amphetamine-type stimulant (ATS) use is also less researched. Some suggest that stimulants may be used by some sex workers to remove the need for food and rest, and to remain alert and awake while working long hours [24].

This chapter reviews what is known about the prevalence of illicit drug use among sex workers. Acknowledging the diversity of populations and contexts in which drug use and sex work overlap, we aimed to estimate the prevalence of lifetime illicit drug use among sex workers overall, by gender (cis, trans, and non-binary), and by sub-region.

Methods

Search Strategy

In 2018, we searched electronic databases (EMBASE, Pub Med, Web of Science, Sociological Abstracts, and PsychInfo) to identify journal articles published in the preceding decade (2009–2018). Search terms comprised a combination of Medical Subject Headings (MESH) and free text ((sex work*, prostitut*, erotic service, erotic dancer, massage parlour, massage parlour, strip club, OR brothel) AND (substance us*, drug us*, heroin, opioid*, cocaine, methamphetamine, amphetamine, cannabis OR marijuana)) contained within the title, abstract, or keyword.

Inclusion/Exclusion Criteria

The search used a broad definition of sex work, including commercial and transactional sex, in a wide range of settings and venues, including brothels, massage parlours, clubs, bars, streets, parks, and private homes. UNAIDS has recently argued that “Transactional sex is not sex work but refers to non-marital, non-commercial sexual relationships motivated by an implicit assumption that sex will be exchanged for material support or other benefits. Most women and men involved in transactional sex relationships consider themselves as partners or lovers rather than sellers or buyers” ([25]: page 2). However, our review, conducted prior to the publication of the UNAIDS report, included two studies which explicitly included people engaged in transactional sex. We included original studies that measured prevalence of illicit drug use (defined as any use of illicit psychoactive drugs) among sex workers, using either biological markers or self-report. We did not exclude studies on the basis of study design and the review was not restricted according to demographic characteristics (biological sex, gender identity, age, race, or ethnicity), blood-borne viral status of study participants, or the timeframe studies used to define sex work or drug use. However, publications with additional sample inclusion criteria, for example, alcohol, drug or injection drug use, pregnancy or mental health disorders, were excluded due to potential sample bias. Where there were multiple studies from the same sample with estimates of the same outcome, only the most comprehensive study in terms of sample size was included.

Data Extraction and Synthesis

Search results in the form of citations were imported into EndNote (a reference management software programme) and duplicates were removed. Titles and abstracts were screened for relevance and for those considered relevant, full texts

were retrieved and further screened. Screening was done by one author (JI), with screening of a subset of references (10%) by a second author (LM), revealing no discrepancies between the two lists of accepted references. The following data were extracted from the selected studies: study location, study period, design, and lifetime and recent prevalence of (a) illicit drug use and (b) injection drug use. Although data were extracted about recent illicit drug and recent injection drug use, there was inconsistency in the timeframes used to define “recent” (range past 1 day to 12 months).

Where publications involved duplicate study populations, including from longitudinal or open cohort studies, the review retained the publication with the largest sample (typically the most recent publication) containing data on the outcome of interest. Where publications reported data from studies repeated across multiple years, data was extracted for only the most recent survey round where this was available. Most studies did not specify specific drugs used or injected, however, in studies where illicit drug or injection drug use prevalence data was separately listed for a range of individual drugs and where there was potential for overlap due to participants using more than one type of drug, data from the most commonly used or injected drug was extracted.

The review combined data from multiple studies to derive pooled prevalence estimates and 95% confidence intervals (CIs) of lifetime illicit drug use among sex workers, using a random effects model. Countries were categorised into geographic sub-regions according to UN Standard Country or Area Codes for Statistical Use [26]. Sub-regional pooled prevalence estimates of lifetime illicit drug use among female sex workers were also generated. Tableau software (version 2018.3 Tableau, Seattle, WA, USA) was used to map sub-regional prevalence of lifetime illicit drug use among female sex workers, noting that recent illicit drug use data was used as a proxy for lifetime use in three sub-regions where estimates of lifetime illicit drug use were not available. An asterisk “*” is used to denote these three sub-regions on the map. Statistical analyses were conducted using STATA software (version 14.2 Stata Corporation, College Station, TX, USA).

Results

Our search generated 2889 publications (Fig. 6.1). After removal of duplicates ($n = 1334$), 1555 publications were retained for abstract review. The abstract review excluded 1264 publications, with 291 publications retained for further screening via full text review. Of these publications, 38 were conference posters or review articles, 7 did not present data on the population of interest, 52 did not present data on the outcome of interest, 20 included drug use as sample recruitment criteria, and 87 publications used the same study or sample as another retained publication (duplicates). One study was excluded because prevalence of lifetime illicit drug use in the sample was <1%, lower than prevalence in the general population. A total of 86 publications were kept and included in this review.

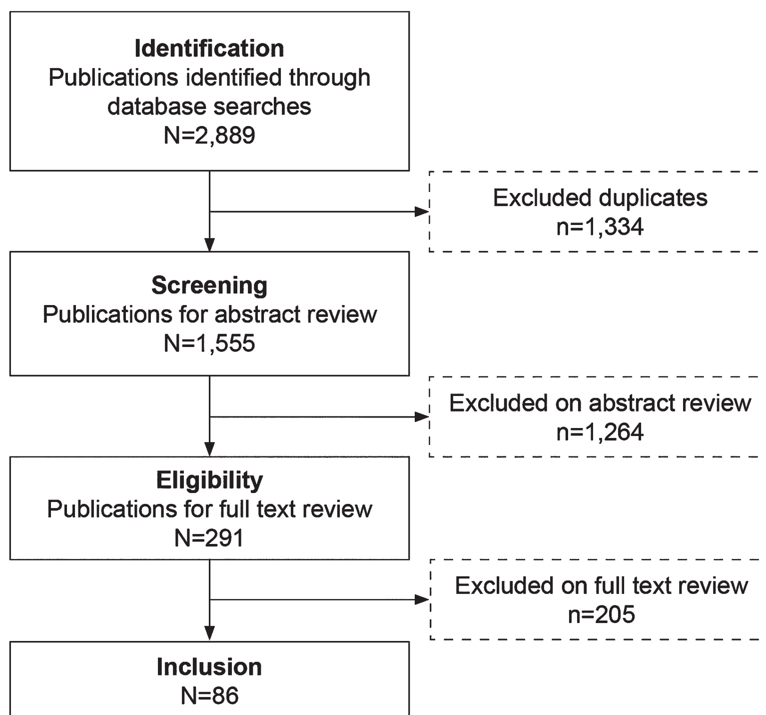

Fig. 6.1 Flow chart of selection for systematic review of illicit drug use among sex workers

Among the $n = 86$ review studies where prevalence of illicit drug use or injection drug use was reported among sex workers, the majority of studies ($n = 70$, 40 countries) reported prevalence among female sex workers, 13 studies (10 countries) reported prevalence among male sex workers, 6 studies (5 countries) reported prevalence among transgender including kathoey (defined as male to female transgender), and hijra (defined as people whose birth sex is male but who identify as female or non-binary sex workers), and 5 studies (5 countries) reported prevalence among combined population groups. Six publications reported prevalence among more than one subpopulation of sex workers. Of the six studies that included transgender sex workers, all were transwomen, and only one specifically focused on this group (100% of participants). Transwomen sex workers accounted for a minority of participants in the other five studies, ranging from 7.8% to 43% of participants, with these samples primarily comprised of female ($n = 4$ studies; range 34.5%–87.5% of participants) or male ($n = 1$; 57% of participants) sex workers. No studies included transmen.

The studies identified in the review were from 46 countries, encompassing the Americas (sub-regions Caribbean, Central America, South America, Northern America), Asia (sub-regions Central Asia, Eastern Asia, South-eastern Asia, Southern Asia, and Western Asia), Africa (Eastern Africa, Western Africa, and Southern Africa),

Europe (Eastern Europe, Northern Europe, Southern Europe, and Western Europe), and Oceania (Australia and New Zealand and Melanesia). No studies were identified from the sub-regions of Northern Africa, Middle Africa, or Micronesia.

Included studies used different criteria to define current sex work (ranging from the last 4 months to 5 years) and recent drug use (ranging from the last 24 h to 12 months). Studies varied considerably in sample size (range 31–18,475, median 401) and methods of recruitment (venue and street outreach $n = 59$; respondent-driven sampling (RDS) $n = 12$; snowball sampling $n = 6$, service attenders $n = 6$, and web-based recruitment $n = 3$). A range of study designs were included, including cross-sectional studies ($n = 71$, 83%), cohort studies ($n = 10$, 12%), randomised controlled trials ($n = 3$, 3%), and case series ($n = 2$, 2%). The randomised controlled trials, cohort and case series studies all reported cross-sectional baseline data. All studies identified in the review were conducted from 2000 onward, with most (60%, $n = 52$) conducted in the past decade (from 2009).

Global pooled prevalence of lifetime illicit drug use among sex workers (39 studies from 23 countries) was 35% (95% CI 30–41%). There was significant heterogeneity or diversity ($I^2 > 90.0\%$, $P < 0.01$), with prevalence of lifetime and recent drug use ranging from 1.2% [27] to 84% [28, 29] and 1.7% [30] to 98% [31, 32], respectively. Similarly, prevalence of lifetime and recent injection drug use varied from 0% [33] to 82% [34] and 0% [35] to 48% [14], respectively (Tables 6.1, 6.2, 6.3, and 6.4).

Table 6.1 Review studies: Prevalence of illicit drug use and injection drug use among female sex workers

Region	Source	Study period	Design	Illicit drug use		Injection drug use	
				Lifetime % (*n*/*N*)	Recent % (*n*/*N*)	Lifetime % (*n*/*N*)	Recent % (*n*/*N*)
AFRICA							
Eastern Africa							
Ethiopia	Bugssa, 2015	2013	CS	16.6 (53/319)	–	–	–
Kenya	Tegang, 2010	2007	CS	71.0 (211/297)	–	–	–
Malawi	Lancaster, 2016	2014	CS	–	23.9 (33/138)[C]	–	–
Mauritius	Johnston, 2012	2010	CS	–	28.3 (86/299)[3a]	37.4 (120/299)[a]	30.5 (99/299)[3a]
Tanzania	Leddy, 2018	2005–2006	RCT	6.9 (34/496)	–	–	–
Uganda	Bukenya, 2013	2008–2009	C	–	21.2 (192/905)[1]	–	–
Southern Africa							
Swaziland	Berger, 2018	2011	CS	–	31.1 (101/325)[12]	–	–
Western Africa							
Nigeria	Okafor, 2017	2010	CS	–	–	–	4.3 (78/1796)[U]
AMERICAS							
Caribbean							
Dominican Republic	Kerrigan, 2016	2016	CaS	25 (57/228)	15.4 (35/228)[6]	–	–
Jamaica	Duncan, 2010	2005	CS	56.6 (245/450)	–	3.6 (16/439)	–
Central America							
Mexico	Robertson, 2012	2004–2006	CaS	–	32.1 (297/924)[1b]	13.4 (124/924)	–
Mexico	Chen, 2012a	2009–2010	CS	52.5 (105/200)	–	–	–
Mexico	Semple, 2015	2011–2013	RCT	–	–	–	10.3 (110/1089)[1]
Mexico	Semple, 2016	2011–2013	RCT	–	10.6 (106/1001)[1]	–	–
Mexico	Conners, 2018	2013–2014	C	61.0 (182/301)	38.2 (115/301)[6]	–	23.6 (71/301)[6]
Panama	Hakre, 2013	2009–2011	CS	26.2 (262/999)	–	–	–
South America							

(continued)

Table 6.1 (continued)

Region	Source	Study period	Design	Illicit drug use		Injection drug use	
				Lifetime % (*n*/*N*)	Recent % (*n*/*N*)	Lifetime % (*n*/*N*)	Recent % (*n*/*N*)
Argentina	Bautista, 2009	2000–2002	CS	20.8 (157/625)	–	–	–
Brazil	Fernandes, 2014	2009–2011	CS	–	35.7 (169/402)[Ua]	–	1.2 (5/402)[U]
Brazil	Devóglio, 2016	2014	CS	–	51.8 (43/83)[U]	–	–
Colombia	Hooi, 2018	2014	CS	6.9 (5/76)	–	–	–
Northern America							
United States	Martin, 2010	2006–2007	CS	83.8 (98/117)	–	–	–
United States	Reuben, 2011	2008–2009	CS	–	97.7 (42/43)[3]	–	46.51 (20/43)[3]
United States	Terplan, 2018	2013	CS	–	43.8 (42/96)[6]	–	8.3 (8/96)[6]
ASIA							
Central Asia							
Uzbekistan	Todd, 2009	2004–2005	CS	–	–	5.2 (17/329)	–
Eastern Asia							
China	Lau, 2010	2004	CS	–	–	40.4 (118/293)	–
China	Xu, 2013	2006–2007	CS	15.9 (261/1642)	–	–	7.4 (122/1642)[3]
China	Wang, 2012a	2006–2009	C	12.9 (265/2051)	–	6.8 (140/2051)	–
China	Liao, 2012a	2008[c]	CS	13.2 (152/1150)	–	0.4 (5/1150)	–
China	Li, 2017	2008–2009	CS	–	7.4 (118/1604)[12]	–	0.9 (15/1604)[12]
China	Chen, 2012b	2009	C	–	–	–	0.3 (20/7083)[U]
China	Wang, 2012b	2009	CS	1.2 (4/345)	–	–	–
China	Liao, 2012b	2009[c]	CS	13.9 (60/431)	–	1.2 (5/431)	–
China	Yang, 2011	2009[c]	CS		3.2 (13/411)[12]	–	–
China	Cai, 2013	2009–2012	CS	4.1 (67/1653)		–	–
China	Zhang, 2014	2010[c]	CS	–	1.7 (7/404)[3]	–	–
China	Zhang, 2016	2012	CS	–	8.7 (27/310)[12]	–	–

China	Liao, 2016	2013[c]	CS	36.0 (144/400)	–	0.0 (0/400)	–
China	Zhou, 2014	2013–2014	CS	–	–	–	3.9 (30/1115)[6]
China	Zhang, 2015	2014[c]	CS	3.4 (12/358)	–	–	–
South-eastern Asia							
Cambodia	Couture, 2012	2007–2008	C	40.6 (65/160)	25.0 (40/160)[3]	1.2 (2/160)	0.0 (0/160)[3]
Cambodia	Wadhera, 2015	2009–2010	C	27.3 (60/220)	27.3 (60/220)[3]	–	–
Malaysia	Wickersham, 2017	2014	CS	–	23.2 (114/492)[1]	–	–
Myanmar	Hail-Jares, 2016	2012	CS	–	31.7 (32/101)[C]	–	1.0 (1/101)[6]
Philippines	Urada, 2014	2009–2010	CS	–	20.4 (34/167)[U]	–	–
Thailand	Nemoto, 2013	2006	CS	–	22 (45/205)[12]	–	–
Vietnam	Nguyen, 2009	2003	CS	8.9 (35/394)	–	–	–
Vietnam	Tran, 2014	2007–2008	CS	3.5 (70/1998)	–	1.3 (26/1998)	–
Vietnam	Le, 2015	2009–2010	CS	9.9 (523/5298)	–	5.2 (273/5298)	3.7 (195/5298)[1]
Southern Asia							
Afghanistan	Todd, 2010	2006–2008	CS	6.9 (36/520)	–	0.4 (2/520)	–
Bangladesh	Hengartner, 2015	2011–2012	CS	–	30.9 (80/259)[U]		–
India	Medhi, 2012	2006	CS	25.1 (107/426)	–	5.6 (24/426)	–
Iran	Karamouzian, 2017	2010	CS	71.6 (642/871)	–	14.6 (127/871)	–
Iran	Kazerooni, 2014	2010–2011	CS	69.9 (195/278)	–	11.5 (32/278)	–
Iran	Shokoohi, 2019	2015	CS	–	24.9 (335/1347)[1]	–	4.3 (58/1347)[1]
Nepal	Kakchapati, 2017	2004–2016	CS	6.2 (369/5958)	–	–	–
Pakistan	Melesse, 2016	2011	CS	–	–	–	10.1 (296/2927)[6]
Western Asia							
Lebanon	Mahfoud, 2010	2007–2008	CS	–	–	0.0 (0/135)	–
EUROPE							
Eastern Europe							
Moldova	Zohrabyan, 2013	2009–2010	CS	–	–	12.0 (79/658)	4.6 (30/658)[12]
Russian Federation	Decker, 2012	2005	CS	–	–	82.3 (121/147)	–

(continued)

Table 6.1 (continued)

Region	Source	Study period	Design	Illicit drug use		Injection drug use	
				Lifetime % (*n*/*N*)	Recent % (*n*/*N*)	Lifetime % (*n*/*N*)	Recent % (*n*/*N*)
Russian Federation	Odinokova, 2014	2007–2008	CS	71.3 (639/896)	57.3 (513/896)^{1}	–	47.5 (426/896)$^{0.03}$
Russian Federation	Wirtz, 2015	2011	CS	–	–	21.6 (163/754)	10.7 (81/754)^{6}
Ukraine	Lakunchykova, 2017	2013	CS	–	–	–	6.0 (286/4764)^{C}
Northern Europe							
United Kingdom	Platt, 2011	2008–2009	CS	41.4 (103/249)	–	–	–
Southern Europe							
Portugal	Dias, 2015	2011	CS	31.1 (265/853)	–	5.6 (48/853)	–
Croatia	Stulhofer, 2010	2008	CS	–	–	35.7 (55/154)	–
Western Europe							
The Netherlands	van Veen, 2007	2002–2005	CS	–	18.1 (88/487)^{6}	9.4 (46/487)	–
OCEANIA							
Australia and New Zealand							
Australia	Tang, 2013	2002–2011	CS	–	–	–	10.3 (443/4296)^{U}
Australia	Read, 2012	2009–2011	CS	–	–	0.8 (13/1540)	
Australia	Callander, 2018	2009–2015	C	–	–	–	4.6 (846/18,475)^{12}
Melanesia							
Papua New Guinea	Bruce, 2010	2003	CS	–	54.4 (43/79)$^{0.25}$	–	–

Acronyms: *CS* cross-sectional study, *C* cohort study, *RCT* randomised control trial, *CaS* case series

–, Data not available

Superscript denotes drug use/injection timeframe in months or defined as C (current); R (regular); U (timeframe unspecified)

[a]Adjusted

[b]During/before sex

[c]Most recent year data extracted

Table 6.2 Review studies: Prevalence of illicit drug use and injection drug use among male sex workers

Region	Source	Study period	Design	Illicit drug use		Injection drug use	
				Lifetime % (*n*/*N*)	Recent % (*n*/*N*)	Lifetime % (*n*/*N*)	Recent % (*n*/*N*)
AFRICA							
Eastern Africa							
Kenya	McKinnon, 2014	2009–2012	C	–	11.8 (60/507)[C]	–	–
AMERICAS							
Northern America							
United States	Grov, 2015	2013	CS	–	43.5 (170/391)[12]	–	–
United States	Underhill, 2014	2013–2014	CS	–	67.7 (21/31)[0.25]	–	46.2 (24/52)[6]
ASIA							
Central Asia							
Uzbekistan	Todd, 2009	2004–2005	CS	–	–	7.0 (3/43)	–
Eastern Asia							
China	Liu, 2012	2009	CS	–	19.9 (83/418)[6]	0.2 (1/418)	–
South-eastern Asia							
Vietnam	Biello, 2014	2010	CS	–	15.6 (45/288)[1]	–	–
Vietnam	Yu, 2015	2010–2011	CS	46.0 (327/710)	–	8.0 (57/710)	–
Southern Asia							
Pakistan	Shaw, 2010	2005–2006	CS	–	5.9 (68/1162)[6]	–	–
Pakistan	Melesse, 2016	2011	CS	–	–	–	0.8 (24/2808)[6]
EUROPE							
Eastern Europe							
Czech Republic	Bar-Johnson, 2015	2011	CS	–	42.5 (17/40)[R]	–	–
Russian Federation	Baral, 2010	2005–2006	C	16.0 (8/50)	–	8.0 (4/50)	–
Southern Europe							
Portugal	Dias, 2015	2011	CS	68.9 (73/106)	–	9.4 (10/106)	–
Spain	Ballester-Arnal, 2017	2015	CS	–	38.7 (31/80)[C]	–	–

Acronyms: CS (cross-sectional study); C (cohort study)
–, Data not available
Superscript denotes drug use/injection timeframe in months or defined as C (current); R (regular)

Table 6.3 Review studies: Prevalence of illicit drug use and injection drug use among transgender sex workers

Region	Source	Study period	Design	Illicit drug use		Injection drug use	
				Lifetime % (*n*/*N*)	Recent % (*n*/*N*)	Lifetime % (*n*/*N*)	Recent % (*n*/*N*)
ASIA							
South-eastern Asia							
Thailand	Nemoto, 2012	2006	CS	–	53.6 (60/112)[12a]	–	–
Malaysia	Wickersham, 2017	2014	CS	–	18.6 (36/193)[1]	–	–
Southern Asia							
Pakistan	Shaw, 2010	2005–2006	CS	–	4.9 (75/1532)[6]	–	–
Pakistan	Melesse, 2016	2011	CS	–	–	–	2.2 (61/2748)[6]
EUROPE							
Southern Europe							
Portugal	Dias, 2015	2011	CS	46.9 (38/81)	–	3.7 (3/81)	–
Western Europe							
The Netherlands	van Veen, 2007	2002–2005	CS	0	5.7 (4/70)[6]	5.7 (4/70)	–

Acronyms: *CS* cross-sectional study
–, Data not available
Superscript denotes drug use/injection timeframe in months
[a]During/before sex

The majority of studies reporting prevalence of lifetime illicit drug use were conducted among female sex workers (32 studies from 20 countries), and global pooled prevalence among this sub-group was 29% (95% CI 24–34%). The review identified significant geographic variation in lifetime illicit drug use among female sex workers (Fig. 6.2), with pooled prevalence higher in Northern America (84%, 95% CI 76–90%) and Eastern Europe (71%, 95% CI 68–74%) compared to Eastern Asia (12%, 95% CI 7–17%) and South-eastern Asia (16%, 95% CI 11–22%). Insufficient studies were identified to generate pooled estimates of lifetime illicit drug use among male (3 studies) and transgender (1 study) sex workers.

Table 6.4 Review studies: Prevalence of illicit drug use and injection drug use among combined sex worker populations

Region	Source	Study period	Design	Illicit drug use		Injection drug use	
				Lifetime % (*n*/*N*)	Recent % (*n*/*N*)	Lifetime % (*n*/*N*)	Recent % (*n*/*N*)
AFRICA							
Southern Africa							
South Africa	Poliah, 2017	2015	CS	82.6 (128/153)	–	–	–
AMERICAS							
Northern America							
Canada	Goldenberg, 2017	2010–2014	C	–	67.6 (513/759)[6]	–	39.3 (298/759)[6]
EUROPE							
Eastern Europe							
Hungary	Moro, 2013	2010	CS	84.3 (430/510)	0	–	–
Southern Europe							
Serbia	Ilić, 2010	2006–2007	CS	–	98.4 (188/191)[U]	–	15.7 (30/191)[U]
OCEANIA							
Australia and New Zealand							
Australia	Cregan, 2013	2008	CS	–	90.7 (97/107)[R]	–	–

Acronyms: *CS* cross-sectional study, *C* cohort study
–, Data not available
Superscript denotes drug use/injection timeframe in months or defined as R (regular); U (time-frame unspecified)

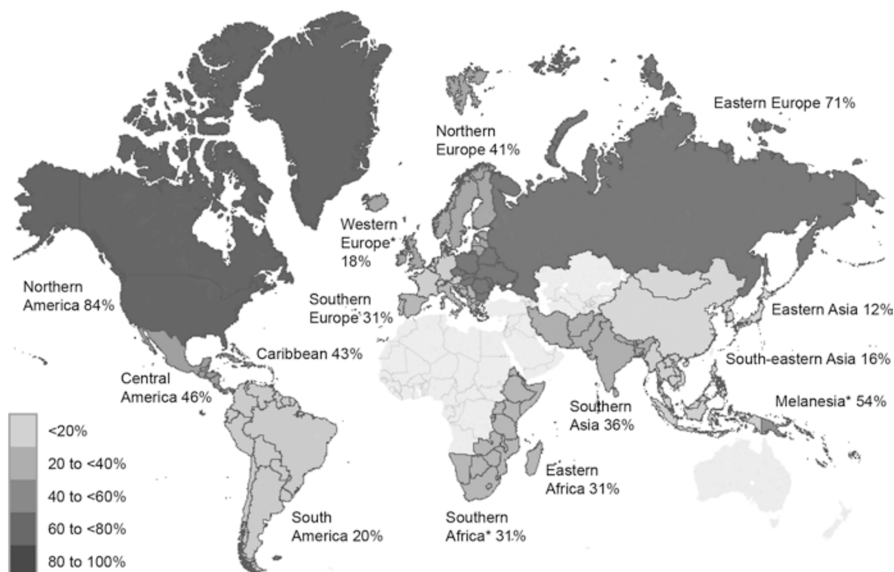

Fig. 6.2 Lifetime illicit drug use among female sex workers by sub-region

Box 6.1 Case Studies[1]

Our case studies from the St. James Infirmary (SJI) illustrate the diversity of experiences among sex workers who use drugs. Founded in San Francisco in 1999 and operated by current and former sex workers, SJI aims to provide compassionate and non-judgemental prevention, treatment and social services for all sex workers.

1. *Abdul*

   Abdul is an attractive, softly spoken, 24-year-old cisgender gay Arab-American man. His religious family emigrated from the Middle East when he was a baby. At 19, in his first year of college, he was "outed" as gay to his parents, who threw him out of their home and threatened to have him killed. He dropped out of school and fled to a major city several hundred miles away where he hoped his parents couldn't reach him. Alone and unable to reach out to his existing networks for fear of being located, he began engaging in transactional sex with mostly older men in order to earn money and have safe places to stay. It was at this time that he was introduced to both poppers and methamphetamine, both of which are common in gay male "party and play" (P&P) interactions. They increase libido, sexual stamina, and receptivity in anal sex. In fact, he found that much of the sex work available to gay men is predicated on such arrangements, whereby clients supply the drugs and invite younger men over to engage in long-lasting, drug-fueled sexual encounters, often involving multiple partners.

   Abdul was able to eventually find a full-time job working with LGBT youth. It does not pay well since he lacks a college degree. He still engages in occasional sex work to supplement his income, sometimes opportunistically (meeting clients in bars or cruising spots), and sometimes more intentionally by placing ads online. Even though Abdul does not routinely use drugs (aside from nicotine), he finds it difficult to pass up P&P sessions since they are often relatively lucrative, with clients booking for multiple hours or even several days at a time. Unfortunately, once the "partying" begins, it is much harder for him to negotiate or enforce his rates, sexual boundaries, or safer sex practices. Last month, a client invited him over, got him high, and kept him overnight with promises of more and more money as the night wore on, but the next morning the client threw him out without paying him at all. When Abdul tried to demand his money, the client, a wealthy white businessman in his mid-50s, threatened to call the police. Abdul didn't push back because he felt that police involvement would make an already bad situation even worse for him.

(continued)

[1] All names and personal identifiers in the case studies have been changed to protect privacy and confidentiality.

Box 6.1 (continued)

2. *Cassie*

Cassie, a 25-year-old black transgender woman, was taken away from her birth parents when she was a toddler. Both her parents struggled with addiction to crack cocaine, and both died of AIDS early in Cassie's life. After several years in foster care, she was adopted by an extremely strict, religious family. Her adoptive father died soon after, leaving her adoptive mother to raise three children alone in a small town. Her mother became emotionally, verbally, and physically abusive towards Cassie, oftentimes for presenting as effeminate. Cassie is still impacted by these emotional wounds. She also experienced sexual abuse by an uncle and several older male cousins.

Cassie escaped her difficult childhood by disappearing into books; her avid reading helped her become a good student. However, by the end of tenth grade, her abusive home life had become unbearable, so Cassie dropped out of high school and ran away to San Francisco where she could live as a woman and make her own way. At 16, she started taking feminising hormones and quickly realised she could support herself through street-based sex work; she often found that her clients made her feel beautiful and validated as a woman in ways the rest of the world often did not. Her hormones also meant that she was largely reliant on black market "performance enhancing" prescription drugs such as Viagra and Cialis to be able to provide the kind of sexual experience her clients were looking for. She often had to "check out" of her body to engage in this kind of work.

In spite of lifetime struggles with depression and other PTSD symptoms, Cassie developed a tight network of other young transwomen friends, quickly emerging as a natural leader among her peers. However, ongoing bouts with homelessness led her to start smoking methamphetamine to stay awake at night, which helped protect her from being robbed or assaulted in her sleep—this had happened several times to her at shelters, so she quickly stopped staying in them. When she smoked meth, she found that the ongoing crushing sense of doom plaguing her disappeared. The drug made her feel "euphoric" and "invincible". She began using methamphetamine more regularly, prompting increasingly erratic behaviours. She found herself engaging in high-risk sexual activity while high, considering it a minor miracle that she remains HIV-negative, especially given how many of her friends have sero-converted.

Cassie became trapped in cycles of short-term incarceration and release; when incarcerated, she was sober and able to stabilise on her psychiatric medications, and would revert back to the witty, empathetic person she had been before, in spite of the oppressive conditions of jail. As soon as she was released (usually back to the street, as she was still homeless) she would decompensate, self-medicate with methamphetamine, and start the

(continued)

Box 6.1 (continued)

cycle anew. After a recent arrest, she is now facing a multi-year prison sentence since her record is one of missed court dates and increasingly serious charges. Although she has gained valuable skills that would make her employable, Cassie is so ashamed of her ongoing struggles with drugs and incarceration that she does not engage with the organisations where she previously found support, making her increasingly reliant on sex work to earn money.

Cassie wants to become a professional makeup artist, and has the looks, talent, and charisma to make a career of it, if given the support to meet her mental health and addiction needs. However, engaging her in long-term therapy has proven elusive thus far, and permanent housing to help her stabilise is now out of reach since she's no longer eligible for the youth housing programmes she relied on when she was younger. The short-term housing that is available is abstinence-only, and since she is not ready to give up using meth, she is not eligible to stay there.

3. *Roxanne*

Roxanne is a 53-year-old white cisgender woman. She grew up in San Francisco, and started drinking, smoking marijuana, and using PCP and hallucinogens with friends when she was 13. During that time, she was living at home with her parents and siblings. After graduating high school, she moved into a house with some friends and pieced together jobs to earn enough money for rent. After partying all night with her friends, she would mix some amphetamines into her morning coffee to help her get through the workday. Roxanne looks back on this time of her life with fondness.

When Roxanne was 25, a man she was dating turned her on to crack, which quickly became the most important thing in her life. She realised that to support her habit she needed to find additional ways to make money. Roxanne started doing sex work, learning from other women working the streets. Between drug use and sex work, she went to jail close to 40 times. Sometimes this was for possession charges, other times it was for solicitation or loitering with the intent to engage in prostitution.

When Roxanne was 45 she decided she was tired of using and of engaging in sex work to support her use. She went into a programme at a drop-in centre which she knew other women had successfully used to get sober. After maintaining a year of sobriety, she met a man and they started dating. She knew he was dealing drugs, but she thought she would be able to date him and stay sober. However, once she moved in with him, the proximity to crack was too much for her and she started using again. Initially, he was giving her crack for free but then told her she would have to pay for it. Roxanne found herself back in the position of needing to sell sex to support her habit.

By the time Roxanne was almost 50, she knew she wanted to change. She was worn out and tired. She realised she had missed time with her five

(continued)

Box 6.1 (continued)

children, four of whom were now adults and had not spent time with her two grandkids. Over the years, Roxanne gave her children to other family members because she knew she was not capable of taking care of them. As she described it, crack was in the way of everything. Roxanne went back to the drop-in centre she had used years before and they helped her get into a residential treatment programme. She was in that programme for a year before moving into a transitional living house. During that time, she started to rebuild relationships with her family.

Still new in her recovery, Roxanne is taking it slow and trying not to put too much pressure on herself. She feels as if she is starting life all over again. She and her roommate are hoping to move out of San Francisco; she wants a break from all the noise and to be closer to her children. She's also upset that men will approach her outside her apartment building and ask if she smokes (referring to crack). She knows she does not want to use again, but when people ask her that, she initially wants to say yes. Although she would prefer to not do sex work, both her criminal record and inconsistent legal work history make it hard for her to find employment. When necessary, Roxanne will do sex work to get a little extra money. If someone is presentable and has some money, she is willing to perform oral sex or give them a hand job but longer has vaginal sex with clients. That is something she never wanted to do, and only did to support her crack use.

4. *Claire*

Claire is a 38-year-old Asian American bisexual cisgender woman. Claire started engaging in erotic massage work in her early 20s to help pay her way through college and started working full-time as a dominatrix at a professional dungeon after she finished school. After a few years at the dungeon, she "went independent", finding clients via online ad platforms. She found that the flexible hours and relatively high hourly pay allowed her to spend time making art, volunteering at a local animal shelter, and eventually earning her Master's degree in psychotherapy. Since completing her degree, Claire has leveraged her unique understanding of sexual issues to carve out a niche for herself as a sex therapist, helping people develop greater comfort with their bodies and sexuality. She finds this work both fulfilling and financially rewarding, and she now balances her "above-board" therapy practice with a continued (yet separate) career as a successful professional Dominatrix.

Claire has a large, close-knit circle of friends which includes other sex workers, people in tech, and a number of artists and musicians. On weekends, she indulges in a number of "party drugs", such as ketamine, GHB and MDMA, often going out to dance all night to electronic music or hosting friends at the home she co-owns with her husband (also a sex worker) and several others. She also uses marijuana, usually to unwind at night. Although she enjoys getting high, she has very strong boundaries around her engagement with clients, and has strict policies about keeping her personal and professional lives separate: when it comes to clients, the only thing she indulges in is an occasional glass of wine if out to dinner with a submissive.

Our case studies indicate that the existing literature fails to adequately capture the complexity and needs of sex workers. Nuances regarding types of sex work, differences between types and patterns of sex work, sex work trajectories, working conditions and contexts, and the full spectrum of gender and other demographic factors are erased by studies that fail to account for these complexities. In order to design programmes that will best serve sex workers' needs, different sub-populations targeted by such programming need to be given the tools, resources, and support to design programmes specific to their circumstances. For example, the needs of full-service, street-based transgender sex workers will be very different from the needs of relatively well-to-do, independent indoor escorts, which in turn will differ widely from the needs of gay men who are dancers in a strip club.

Discussion

We identified 86 studies from 46 countries, encompassing the Americas, Asia, Africa, Europe, and Oceania. Most studies were cross-sectional in design (80%) and conducted in the last decade (60%). The majority of studies ($n = 70$) reported prevalence among "female" sex workers, with only 13 studies reporting prevalence among male sex workers, 6 reporting prevalence among transgender sex workers, and 5 studies which reported prevalence among combined population groups. However, because most studies only identified participants as "female", "male", or "transgender", we were unable to estimate prevalence by gender identity (cis, trans, or non-binary).

Global pooled prevalence of lifetime illicit drug use was 35%, with prevalence of lifetime and recent drug use ranging from 1.2% to 84% and 1.7% to 98%, respectively. Similarly, prevalence of lifetime and recent injection drug use varied from 0% to 82% and 0% to 48%, respectively. The majority of studies reporting prevalence of lifetime illicit drug use were conducted among female sex workers and global pooled prevalence among this sub-group was 29%. Pooled prevalence was higher in Northern America (84%) and Eastern Europe (71%) compared to Eastern Asia (12%) and South-eastern Asia (16%).

Despite the fact that more than a third of sex workers in our review reported lifetime use of illicit drugs, there is no specific guidance on the delivery of services for people who sell sex and use drugs [36]. Most programmatic interventions for sex workers are HIV-informed, and few interventions specific to this population exist for drug use. The only systematic review of interventions targeting illicit drug use in (street-based) sex workers concluded that there was no strong evidence for the effectiveness of interventions to reduce illicit drug use among street-based female sex workers with problematic drug use [37]. Nonetheless, a recent review concluded that interventions that combined structural approaches (as opposed to only focusing on the individual), harm reduction, safer sex interventions, and access to sex work-specific health services were more successful than single interventions which did not, highlighting the need for multi-component approaches [38].

Evidence-based harm reduction, including drug treatment such as opioid agonist therapy (OAT), remains difficult to access for drug users, including sex workers who use drugs, particularly in low- and middle-income countries [39]. Sex work, harm reduction, and drug treatment services often operate separately from each other and few programmes are tailored to people who both use drugs and sell sex. This is particularly important in the context of the current opioid overdose crisis in North America [40], where integrated service provision for sex workers who use drugs will be key to effective scale-up of interventions designed to reduce morbidity and mortality. Barriers to service access are further accentuated for this population because of the compounded stigma surrounding both drug use and sex work, and the prevailing legal and policy environments in most countries that criminalise aspects of one or both.

Our review has limitations. Grey literature and non-peer-reviewed publications were not included. There was inconsistency in the timeframes used to define "recent" drug and injection drug use. Because we were unable to distinguish between mono and poly drug use among studies that reported drug use by drug type, we extracted data from the illicit drug most commonly used, which may have resulted in an underestimate of prevalence in some studies. On the other hand, because our review estimated lifetime prevalence of any illicit drug use, it is not possible to draw meaningful correlations between drug use and sex work, as most studies did not differentiate between different types of drugs (i.e. opioids versus stimulants), or different patterns of use (occasional vs. habitual, long ago or in the present).

Most included studies were also from low-middle income countries (78%, 67 of 86 studies), with no studies included from the sub-regions of Northern Africa, Middle Africa, and Micronesia. Although we found high diversity between studies, there was no evidence to suggest that this was explained by geographical region. Geographic mapping of pooled prevalence used lifetime illicit drug use; however, "recent" illicit drug use was used as a proxy for three sub-regions where estimates of lifetime use were not available, which also likely results in an underestimate in prevalence for these sub-regions. The cross-sectional design and convenience sampling of most included studies limits the strength of the evidence and highlights the need for more rigorous research, including a standardised approach to data collection and measurement to document prevalence.

Our review did not identify sufficient data to provide pooled prevalence estimates of lifetime illicit drug use among male and transgender sex workers, limiting our ability to make comparisons between sex workers. Limited data on transwomen sex workers, and a global scarcity of data on drug use among transmen engaged in sex work, is both a limitation and a finding of our review. Few studies specified cis, trans, or non-binary gender identity, and it is possible that some studies of "female" and "male" sex workers included cis- and transgender sex workers. Given that gender and sexual identity have been identified as key factors influencing vulnerability to harmful drug use [39, 41], the inability to classify results by gender identity reduces our understanding of these issues. The scarcity of data on male and transgender sex workers, particularly transmen, is a key gap that should be addressed in future research.

Our review also included estimates from two studies of sex workers which explicitly included people engaged in transactional sex [31, 35]. A recent UNAIDS report which focuses on adolescent girls and young women in sub-Saharan Africa argues that sex workers and people who engage in transactional sex are distinct populations, that interventions for sex workers will not reach people engaged in transactional sex, and that programmes need to take care not to conflate transactional sex and sex work when designing interventions [25].

Finally, our review of the prevalence literature was unable to capture lived experiences of drug use and sex work and therefore cannot speak to the ways in which many sex workers manage to balance illicit drug use and sex work with a high level of day-to-day functionality and life meaning. However, our case studies provide insights into these lived experiences and demonstrate that the characteristics, circumstances, drug use and needs of people engaged in sex work can and do vary widely. The epidemiological literature has often treated sex workers as a monolith, focusing predominantly on cisgender women who offer "full service" sex work, either on the streets or in brothel settings. By overlooking the diversity of experiences of people who do sex work, a huge swathe (in fact, according to St. James Infirmary, the majority) of sex workers' needs are unknown and unaccounted for. Also lost is the ability for practitioners to apply lessons learned from sex workers who have kept themselves safe and healthy—often while using illicit drugs—by studying their lives from a strengths-based, harm reduction approach. In the absence of a fuller picture of the intersections between drug use and sex work, it is impossible to gain an accurate understanding of the various factors leading people to engage in either, and the ways in which they do and do not interact with one another.

Conclusions

Using data from 86 studies in 46 countries, we estimated global pooled prevalence of lifetime illicit drug use in sex workers of 35%, with estimates ranging from 1.2% to 84%. The majority of studies included in the review reported prevalence of lifetime illicit drug use among female sex workers (32 studies from 20 countries), and global pooled prevalence among this sub-group was 29%. Insufficient data precluded the generation of global pooled prevalence of illicit drug use among cismen and transgender sex workers.

Our review also aimed to determine whether illicit drug use was more prevalent in sex work populations than the general population. While we identified 39 studies from 24 countries which provided a measure of recent illicit drug use, including 27 which estimated recent use and 12 which estimated recent injection, these had varying definitions and timeframes. These limitations meant that it was not possible to compare global estimates of prevalence among sex workers with normative data, such as the estimates published in the UNODC's World Drug Report [42]. In 2016, UNODC estimated recent (last 12 months) global prevalence of illicit drug use

(defined as use of drugs controlled under the international drug control conventions) in the general population (15–64 years) at 5.6% [42].

Our review highlights a lack of data on the diversity of populations involved in sex work (see case studies, Box 6.1). Current estimates of prevalence provide insufficient data on sex work settings and fail to differentiate between illicit drug use while doing sex work and drug use outside the sex work context. Significant gaps in the availability of data, as well as differences in the timeframes and measures used to estimate prevalence, create a mandate for future research and, specifically, for studies which estimate prevalence in ciswomen, cismen, and transgender sex workers.

Our findings in relation to these data gaps are also consistent with the literature. A recent review of morbidity and mortality data in four overlapping socially excluded populations (homeless people, individuals with drug use disorders, prisoners, and sex workers) found extremely high excess mortality and noted that while people with drug use disorders were the most studied sub-group (42.1% of data points), followed by prisoners (27.1%) and homeless people (26.6%), sex workers (4.2%) were the least well studied [43].

Our results indicate an urgent need to improve the quality and quantity of data on illicit drug use among sex workers. Most studies have focused on cis women, including women who sell sex to support their drug use, and less is known about cis men and transgender sex workers [44]. There is a need for both more robust epidemiological methods and increased measurement rigour to estimate prevalence by sex work population and setting, as well as qualitative research that explores the lived experience of sex work and the intersection of sex work and illicit drug use.

However, such research needs to be guided and, where feasible, conducted by sex workers. We recognise that criminalisation, violence, and stigmatisation present barriers to finding and counting sex workers, let alone expecting them to provide honest answers about their drug use. Research initiated by and/or in partnership with sex worker-led organisations using reliable and ethical methods to capture the diversity and lived experience of sex work populations is necessary to inform rigorous estimates of prevalence, identify differences in risk and exposures, and inform the evaluation and optimisation of evidence-based, human-rights informed, targeted interventions designed to improve the lives of sex workers.

At a programmatic level, while sex workers and people who inject drugs are now recognised as key populations in the global HIV response, funding remains inadequate. As NSWP and INPUD have recently pointed out, “this recognition often fails to translate into funding commitments of appropriate scale and reach, and at times results in health programmes that are not implemented from a rights-based perspective” [45]. Policy and programmatic efforts need to remain mindful that, as a community spanning two key populations, sex workers who use drugs may be at increased risk of harms, including HIV and violence, compared to people who only sell sex or only use drugs [36].

Finally, efforts both to address data gaps and inform public health responses remain hampered by punitive laws and policies governing sex work globally. The criminalisation of both sex work and drug use and the stigmatisation of sex workers who use

drugs impedes the development and delivery of effective and accessible services, including drug treatment. Recent research indicates that sex workers who were unable to access drug treatment were at higher risk for physical violence, including violence perpetrated by clients [46]. Legislative and policy reform is needed to remove punitive laws and policies relating to sex work and drug use/possession. This needs to be accompanied by research on proposed, as well as enacted, sex work and drug use reforms, and their impacts using both public health and human rights frameworks.

Acknowledgements We acknowledge the contributions of sex worker communities to the studies reported here and are grateful to Rachel McCleave for assistance with formatting and referencing.

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