



Original Research

Adverse health outcomes among people who inject drugs who engaged in recent sex work: findings from a national survey



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ABSTRACT

Objectives: This study explores trends in sex work among people who inject drugs (PWID) by gender and the relationship between sex work and adverse health outcomes including overdose, injection-site, and blood-borne virus (BBV) infections.

Study design: The Unlinked Anonymous Monitoring Survey of PWID is an annual cross-sectional survey that monitors BBV prevalence and behaviours, including transactional sex, among PWID recruited through specialist services in England, Wales, and Northern Ireland.

Methods: Trends in sex work among PWID (2011–2021) were described. Data were analysed to assess differences between PWID who engaged in sex work in the past year (sex workers [SWs]) and those who did not (non-SWs) by gender (Pearson χ^2 tests) (2018–2021). Associations between sex work in the past year and adverse health outcomes were investigated using logistic regression.

Results: Between 2011 and 2021, sex work among PWID remained stable, with 31% of women and 6.3% of men who inject, reporting having ever engaged in sex work, and 14% of women and 2.2% of men engaging in sex work in the past year. Between 2018 and 2021, SWs had greater odds of reporting symptoms of an injection-site infection (adjusted odds ratio (aOR): 1.68 [95% confidence interval (CI): 1.31–2.16], $P < 0.001$) and reporting overdose (aOR: 2.21 [CI: 1.74–2.80], $P < 0.001$) than non-SWs had in the past year. Among men, SWs had 243% greater odds of having HIV than non-SWs (aOR: 3.43 [CI: 1.03–11.33], $P = 0.043$).

Conclusions: Our findings highlight disproportionate vulnerability and intersection of overlapping risk factors experienced by PWID SWs and a need for tailored interventions which are inclusive and low-threshold.

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Introduction

People who inject drugs (PWID) and engage in sex work (SWs) are a marginalised and often a particularly vulnerable population due to the compounded effects of criminalisation, exploitation, violence, and stigmatisation.^{1–9} Among approximately 15.6 million PWID worldwide, 17% are estimated to have engaged in sex work

during the past year; however, this varies geographically, from 5% in Western Europe to 21% in North America.⁴

PWID who also engage in sex work are at risk of adverse health outcomes, including infections, due to the intersection of structural factors and sexual and injecting risk behaviours.^{1,2} There is some evidence to show that sex work is independently associated with HIV incidence among PWID,^{10–12} while a UK study of PWID from 2011 found that women with a history of sex work were more vulnerable to injection-site infections than those without.¹³

There is considerable evidence to suggest that risk profiles among PWID and SWs differ by gender, with women who inject drugs and female street SWs often facing additional barriers to accessing healthcare, despite having a high burden of chronic

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physical and mental ill-health.^{14–16} Women who inject drugs and engage in sex work experience a disproportionately high burden of HIV globally.¹⁷ This is thought to be due to several factors: more efficient male-to-female sexual transmission of HIV than female-to-male,¹⁸ higher rates of injection by others and increased rates of sexual violence, exploitation including human trafficking, stigma, and criminalisation.^{19–21}

While the literature characterising male SWs is relatively limited, this group likely overlaps with the population of men who have sex with men (MSM).²² MSM who inject drugs face increased homelessness, socioeconomic disadvantage, criminalisation, stigma, and violence compared to other MSM.²³ Risk behaviours such as drug use during sex are reported more commonly among MSM, which puts this population at higher risk of blood-borne virus (BBV) exposure.^{24,25}

PWID and SWs experience high rates of BBVs,^{4,26} limited access to health and social care services,^{27,28} and are poorly represented in data sources.^{6,13} In 2011, the Unlinked Anonymous Monitoring (UAM) Survey of PWID in England, Wales, and Northern Ireland began collecting data on engagement in sex work. Building on previous analyses of these 2011 data,¹³ this study explores ten-year trends in sex work among men and women who inject drugs and differences in and relationships between sex work in the past year, gender, and adverse health outcomes.

Methods

Data source

The UAM Survey is a long-running annual cross-sectional survey which aims to monitor the prevalence of BBVs and risk and protective behaviours among PWID in England, Wales, and Northern Ireland (ethical approval: London Research Ethics Committee [MREC/98/2/51] and the UK Health Security Agency).²⁹ People who have ever injected psychoactive drugs are recruited through specialist drug and alcohol services and are asked to complete a short questionnaire and provide a dried blood spot sample. This sample is tested for antibodies to HIV (anti-HIV), antibodies to hepatitis B virus (HBV) (anti-HBV = ever infection HBV), antibodies to hepatitis C virus (HCV) (anti-HCV = ever infection HCV) and HCV ribonucleic acid (RNA = current HCV infection). In 2011, a question on transactional sex was introduced: “Have you ever received money, goods, or drugs in exchange for sex?”, with the option to choose one of the following responses: “Yes, in the last year”, “Yes, but not in the last year”, or “Never”.

Statistical analyses

All statistical analyses were performed using STATA v17. UAM Survey participants were included in these analyses if they answered the question on sex work (2011–2021: 93% [$n = 27,158/29,332$]). SWs were defined as people reporting receiving money, goods, or drugs in exchange for sex in the past year. Analyses of 2018–2021 data excluded questionnaires in which respondents indicated previous survey participation, so only first participations were included.

Trends in the prevalence of sex work among PWID were described between 2011 and 2021, using Pearson χ^2 testing to assess changes over time. Data collected between 2020 and 2021 were merged and analysed as a single survey period, due to challenges in recruiting during the Coronavirus (COVID-19) pandemic.³⁰ Pearson χ^2 testing was used to assess the differences in demographics, risk behaviours, BBV infection, and intervention coverage between SWs and non-SWs participating in the UAM

Survey in the recent years (2018–2021) overall and by gender (statistical significance $P < 0.05$).

Multivariable logistic regression was used to investigate the extent to which sex work in the past year was associated with five negative health outcomes among PWID participating recently in the UAM Survey (2018–2021). The outcomes assessed were BBV infection (combined including anti-HIV, anti-HBV, and anti-HCV, as well as separately), self-reported overdose in the past year, and self-reported symptoms of an injection-site infection in the past year. A regression model was developed to adjust outcomes for age, gender, and sex work in the past year and the year of survey. Selection of variables for adjustment was based on statistical significance in univariable analysis ($P < 0.05$) as well as previous evidence of association.^{13,27} Models were run for each of the outcomes for all participants and were stratified by gender.

Results

Trends in PWID reporting sex work

Between 2011 and 2021, the proportion of PWID participating in the UAM Survey ($N = 27,158$) reporting ever engaging in sex work (range: 12%–14%, $P = 0.053$) and reporting engaging in sex work in the past year (range: 4.6%–6.1%, $P = 0.192$) remained relatively stable (Fig. 1).

Among male participants ($N = 19,631$), 6.3% reported ever engaging in sex work, while 2.2% reported engaging in sex work in the past year. Among female participants ($N = 7427$), equivalent figures were 31% and 14%, respectively.

In recent years (2018–2021), 14% PWID ($N = 7672$) reported ever engaging in sex work (6.3% of men [$N = 5506$] and 33% of women [$N = 2166$]), while 6.1% reported engaging in sex work in the past year (2.0% of men and 15% of women).

Characteristics of PWID reporting sex work in the past year

The characteristics of PWID participating in the UAM Survey between 2018 and 2021 who reported sex work in the past year can be found in Table 1, presented overall and stratified by gender. Overall, SWs were younger than non-SWs (median age: 37 [interquartile range {IQR}: 31–43] vs. 41 [IQR: 35–47], $P < 0.001$).

A significantly higher proportion of females reported sex work in the past year than did males (15% vs. 2.0%, $P < 0.001$). A higher proportion of male SWs were MSM than non-SWs (44% vs. 8.2%, $P < 0.001$), and a higher proportion of female SWs were women who reported having sex with women (WSW) than non-SWs (20% vs. 6.8%, $P < 0.001$). Female SWs were more likely to be recruited in London than non-SWs (19% vs. 14%, $P = 0.018$).

Injecting risk behaviours

Overall, SWs started injecting at a younger age than non-SWs (20 years [IQR: 17–25] vs. 21 years [IQR: 18–28], $P < 0.001$) (Table 1). A higher proportion of SWs reported injecting in the past month (65% vs. 52%, $P < 0.001$) and in the past year (82% vs. 64%, $P < 0.001$) than non-SWs. A higher proportion of all SWs reported non-injecting use of heroin (61% vs. 47%, $P < 0.001$), crack (76% vs. 54%, $P < 0.001$), powder cocaine (37% vs. 23%, $P < 0.001$), and amphetamine (15% vs. 8.1%, $P < 0.001$) than non-SWs. A higher proportion of SWs reported sharing any injecting equipment in the past month than non-SWs (58% vs. 37%, $P < 0.001$). While male SWs were less likely to report injecting heroin in the past month than non-SWs (79% vs. 93%, $P < 0.001$), female SWs were more likely to report injecting heroin (99% vs. 94%, $P < 0.001$) or crack in the past month (66% vs. 49%, $P < 0.001$) than non-SWs.

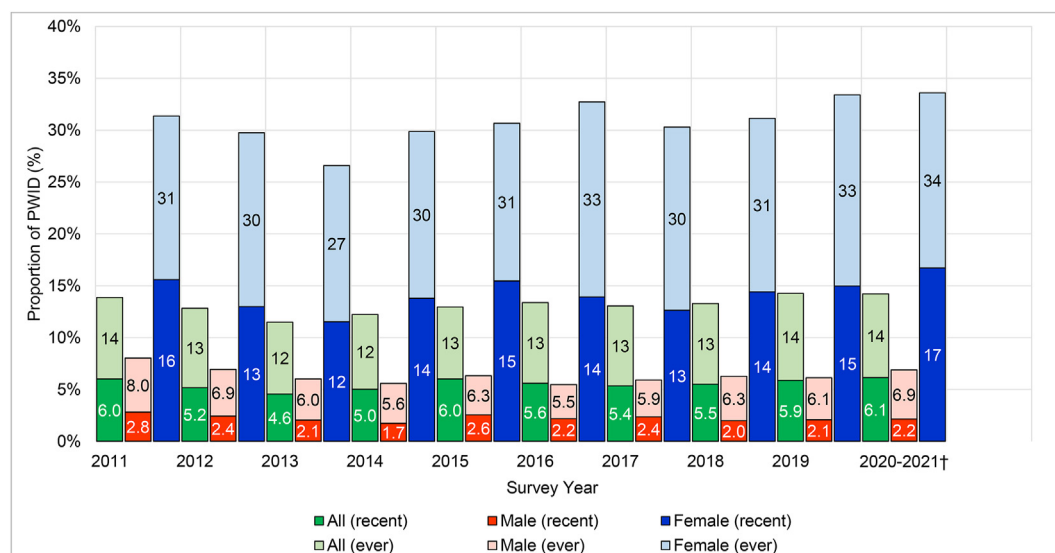


Fig. 1. Trends in self-reported ever and recent* engagement in sex work among PWID by gender: England, Wales and Northern Ireland, 2011–2021. Abbreviation: PWID = people who inject drugs. * Recent sex work was defined as reporting sex work in the past year. † Recruitment to the UAM Survey was impacted by the COVID-19 pandemic and associated lockdown periods during 2020 and 2021. Data from these years should be interpreted with this in mind.

Sexual risk behaviours

Overall, having two or more sexual partners in the past year was more commonly reported by SWs than by non-SWs (71% vs. 21%, $P < 0.001$; Table 1). A greater proportion of SWs were under the influence of one or more drugs while having sex than non-SWs (overall: 84% vs. 64%, $P < 0.001$; male: 88% vs. 66%, $P < 0.001$; female: 83% vs. 61%, $P < 0.001$).

Drugs used during sex also differed by gender and sex work; more male SWs reported being under the influence of either gamma hydroxybutyrate or gamma butyrolactone (16% vs. 2.4%, $P < 0.001$), mephedrone (14% vs. 4.9%, $P < 0.001$), or amphetamine (25 vs. 11%, $P < 0.001$) than male non-SWs, but there was no significant difference among females. More female SWs reported being under the influence of crack cocaine (88% vs. 70%, $P < 0.001$) than female non-SWs, whereas there was no difference among males. Reported use of crystal meth during sex was higher among male and female SWs than among non-SWs (male: 17% vs. 2.8%, $P < 0.001$; female: 4.2% vs. 1.0%, $P = 0.001$). A higher proportion of female SWs reported always using condoms than non-SWs (33% vs. 11%, $P < 0.001$) (Table 1).

Environmental factors

A higher proportion of SWs reported being homeless in the past year than non-SWs (76% vs. 60%, $P < 0.001$) overall and by gender. A higher proportion of all SWs with a history of incarceration reported injecting drugs in prison (17% vs. 12%, $P = 0.009$) (Table 1). A higher proportion of female SWs reported ever being incarcerated (63% vs. 47%, $P < 0.001$) than non-SWs.

Service uptake

Almost all PWID reported accessing some form of health care in the past year (Table 1). A much higher proportion of SWs reported accessing a sexual health service (SHS) within the past year than non-SWs (21% vs. 4.7%, $P < 0.001$).

More female SWs reported an HIV test in the current or previous year than non-SWs (42% vs. 39%, $P = 0.011$), while there was no significant difference among men by sex work status. Female SWs

were more likely to report attending Accident and Emergency (A&E) services than non-SWs (41% vs. 31%, $P < 0.001$).

Health outcomes

In the past year, a higher proportion of SWs reported symptoms of an injection-site infection (55% vs. 41%, $P < 0.001$), or a non-fatal overdose to the point of losing consciousness (34% vs. 16%, $P < 0.001$), than non-SWs (Table 1).

A lower proportion of male SWs tested HCV-positive (44% vs. 55%) or HBV-positive (2.3% vs. 8.9%, $P < 0.001$), than non-SWs.

Health outcomes associated with sex work in the past year among PWID

Between 2018 and 2021, following adjustment, SWs had 68% greater odds of reporting symptoms of an injection-site infection than non-SWs (adjusted odds ratio [aOR]: 1.68 [95% confidence interval {95% CI}: 1.31–2.16]) and more than twice the odds of reporting a non-fatal overdose in the past year (aOR: 2.21 [95% CI: 1.74–2.80]) (Table 2); this association remained after stratifying by gender.

Male SWs had 243% greater odds of having HIV than non-SWs (aOR: 3.43 [95% CI: 1.03–11.33]) but had lower odds of having ever had HCV (aOR: 0.63 [95% CI: 0.40–0.99]).

Discussion

These data from England, Wales, and Northern Ireland show that PWID who engage in sex work are a distinct population. PWID who engaged in sex work were younger, started injecting at a younger age, and reported higher levels of risk practices including sharing of injecting equipment than those who did not. Sex work was much more commonly reported among women who inject drugs. Sex work in the past year was associated with adverse health outcomes including both skin and soft tissue infections (SSTIs) and overdose, as well as having HIV.

We found that SWs reported higher levels of sexual risk behaviours than did non-SWs, such as drug use during sex and multiple sex partners,⁵ that could facilitate transmission of BBVs

Table 1

Characteristics of people who inject drugs reporting sex work in the past year compared with those not reporting sex work in the past year: England, Wales, and Northern Ireland, 2018–2021.

		All			Male			Female		
		No sex work in past year	Sex work in past year	p-value ^a	No sex work in past year	Sex work in past year	p-value ^a	No sex work in past year	Sex work in past year	p-value ^a
Demographics										
Total		7233 (94%)	439 (5.7%)		5395 (98%)	111 (2.0%)		1838 (85%)	328 (15%)	
Median age [IQR] ^b		41 [35–47]	37 [31–43]	<0.001	41 [36–48]	37 [29–44]	<0.001	39 [33–45]	37 [32–42]	<0.001
Born in the UK		6618 (92%)	405 (93%)	0.499	4904 (92%)	96 (89%)	0.300	1694 (94%)	38 (94%)	0.589
Region of recruitment										
Elsewhere		6132 (85%)	358 (81%)		4535 (84%)	92 (83%)		1578 (86%)	265 (81%)	
London		1123 (15%)	82 (19%)	0.077	860 (16%)	19 (17%)	0.738	260 (14%)	63 (19%)	0.018
Gender/sexual identity of sex partners										
MSM ^c		233 (5.8%)	34 (9.4%)		233 (8.2%)	34 (44%)		—	—	
WSW ^d		79 (2.0%)	57 (16%)		—	—		79 (6.8%)	57 (20%)	
Exclusively heterosexual		3689 (92%)	270 (75%)	<0.001	2613 (92%)	43 (56%)	<0.001	1076 (93%)	227 (80%)	<0.001
Injecting and drug use risk behaviours										
Median age first injected [IQR] ^b		21 [18–28]	20 [17–25]	<0.001	21 [18–28]	19 [16–25]	<0.001	22 [18–29]	21 [17–27]	<0.001
Median injecting duration [IQR] ^b		16 [7–22]	15 [7–21]	0.0184	17 [8–23]	18 [8–22]	0.3394	12 [4–19]	14 [7–20]	0.9549
Injected in the past month		3398 (52%)	268 (65%)	<0.001	2610 (53%)	70 (65%)	0.012	770 (47%)	197 (65%)	<0.001
Injected in the past year		4519 (64%)	348 (82%)	<0.001	3460 (66%)	97 (90%)	<0.001	1045 (59%)	250 (79%)	<0.001
Sharing of needles, syringes, and other paraphernalia		1218 (37%)	152 (58%)	<0.001	904 (35%)	44 (67%)	<0.001	309 (41%)	107 (55%)	<0.001
Drugs injected in the past month										
Heroin		3099 (93%)	247 (94%)	0.657	2384 (93%)	53 (79%)	<0.001	707 (94%)	193 (99%)	0.003
Crack		1883 (57%)	174 (66%)	0.003	1508 (59%)	45 (67%)	0.175	371 (49%)	129 (66%)	<0.001
Powder cocaine		541 (16%)	45 (17%)	0.723	541 (16%)	45 (17%)	0.723	107 (14%)	29 (15%)	0.798
Amphetamine		360 (11%)	34 (13%)	0.294	282 (11%)	13 (19%)	0.032	78 (10%)	21 (11%)	0.854
Non-injecting drug use in the past month										
Heroin		2961 (47%)	244 (61%)	<0.001	2181 (47%)	57 (57%)	0.044	769 (49%)	187 (63%)	<0.001
Crack		3384 (54%)	305 (76%)	<0.001	2453 (53%)	68 (68%)	0.002	924 (59%)	237 (80%)	<0.001
Powder cocaine		1447 (23%)	146 (37%)	<0.001	1102 (24%)	59 (59%)	<0.001	333 (21%)	87 (29%)	0.002
Amphetamine		506 (8.1%)	61 (15%)	<0.001	394 (8.5%)	23 (23%)	<0.001	112 (7.1%)	38 (13%)	0.001
Heroin		2961 (47%)	244 (61%)	<0.001	2181 (47%)	57 (57%)	0.044	769 (49%)	187 (63%)	<0.001
Sexual risk behaviours										
Condom use										
Never		2067 (60%)	86 (28%)		1430 (58%)	34 (54%)		633 (67%)	52 (22%)	
Sometimes		893 (26%)	134 (44%)		686 (28%)	23 (37%)		205 (22%)	110 (46%)	
Always		465 (14%)	84 (28%)	<0.001	360 (15%)	6 (9.5%)	0.231	103 (11%)	78 (33%)	<0.001
Sexualised drug use in the past year ^e	Yes	2598 (64%)	310 (84%)	<0.001	1882 (66%)	69 (88%)	<0.001	710 (61%)	241 (83%)	<0.001
Number of sexual partners in the past year										
None		2915 (42%)	48 (12%)		2301 (45%)	20 (21%)		605 (34%)	28 (9.0%)	
One		2542 (37%)	71 (17%)		1643 (32%)	23 (24%)		893 (51%)	48 (15%)	
2+		1468 (21%)	291 (71%)	<0.001	1203 (23%)	54 (56%)	<0.001	262 (15%)	236 (76%)	<0.001
Environmental risk factors										
Homeless in the past year	Yes	3161 (60%)	275 (76%)	<0.001	2429 (60%)	65 (76%)	0.004	724 (58%)	210 (76%)	<0.001
Ever in prison	Yes	4634 (66%)	270 (65%)	0.898	3779 (72%)	71 (72%)	0.869	842 (47%)	198 (63%)	<0.001
Injected drugs in prison	Yes	511 (12%)	43 (17%)	0.009	452 (13%)	19 (30%)	<0.001	57 (7.3%)	24 (13%)	0.011
Health service access										
Used a health service in the past year ^f		7142 (98%)	438 (100%)	0.064	5313 (98%)	111 (100%)	0.191	1807 (98%)	326 (99%)	0.142
Used an A&E or casualty department in past year		2178 (31%)	168 (39%)	0.001	1625 (32%)	34 (32%)	0.951	547 (31%)	134 (42%)	<0.001
Used a sexual health clinic in past year		356 (5.1%)	96 (22%)	<0.001	230 (4.5%)	17 (16%)	<0.001	124 (7.1%)	79 (25%)	<0.001
Recent HIV test										
Never tested		1367 (20%)	69 (16%)		1016 (20%)	21 (20%)		348 (20%)	48 (15%)	
More than two years ago		3036 (44%)	178 (42%)		2226 (43%)	42 (41%)		802 (46%)	135 (42%)	
Current or previous year		2527 (36%)	175 (41%)	0.072	1923 (37%)	40 (39%)	0.895	598 (34%)	135 (42%)	0.011

Table 2

Health outcomes associated with sex work in the past year, by gender: England, Wales, and Northern Ireland, 2018–2021.

Health outcomes	n (% N)	Unadjusted model		Adjusted model ^b	
		OR (95%CI) for sex work	p-value ^a	aOR (95%CI) for sex work	p-value ^a
Overall					
HIV-/HBV-/HCV-positive	204 (56%)	1.01 (0.81–1.25)	0.944	1.01 (0.80–1.23)	0.915
HCV antibody–positive	197 (54%)	1.00 (0.81–1.24)	0.990	0.99 (0.79–1.25)	0.961
HBV antibody–positive	21 (5.8%)	0.64 (0.41–1.00)	0.048	0.90 (0.56–1.47)	0.688
HIV-positive	7 (1.9%)	1.84 (0.84–4.05)	0.127	2.76 (1.18–6.47)	0.020
Symptom of injection-site infection ^c	177 (55%)	1.80 (1.43–2.26)	<0.001	1.68 (1.31–2.16)	<0.001
Overdosed in the past year ^d	141 (34%)	2.67 (2.16–3.30)	<0.001	2.21 (1.74–2.80)	<0.001
Men					
HIV-/HBV-/HCV-positive	40 (46%)	0.66 (0.43–1.00)	0.052	0.66 (0.42–1.04)	0.078
HCV antibody positive	38 (44%)	0.64 (0.42–0.98)	0.039	0.63 (0.40–0.99)	0.047
HBV antibody–positive	2 (2.3%)	0.24 (0.06–0.98)	0.046	0.34 (0.08–1.44)	0.144
HIV-positive	3 (3.5%)	2.94 (0.90–9.60)	0.073	3.43 (1.03–11.33)	0.043
Symptom of injection-site infection ^c	44 (54%)	1.81 (1.16–2.81)	0.008	2.03 (1.29–3.21)	0.002
Overdosed in the past year ^d	41 (39%)	3.31 (2.22–4.94)	<0.001	2.26 (1.48–3.45)	<0.001
Women					
HIV-/HBV-/HCV-positive	163 (59%)	1.19 (0.91–1.54)	0.200	1.14 (0.86–1.50)	0.361
HCV antibody–positive	158 (58%)	1.20 (0.93–1.55)	0.170	1.13 (0.86–1.49)	0.393
HBV antibody–positive	19 (6.9%)	0.79 (0.48–1.29)	0.345	1.03 (0.60–1.75)	0.918
HIV-positive	4 (1.5%)	2.20 (0.69–6.95)	0.180	2.27 (0.70–7.39)	0.175
Symptom of injection-site infection ^c	133 (56%)	1.50 (1.13–2.00)	0.005	1.51 (1.12–2.03)	0.007
Overdosed in the past year ^d	100 (32%)	2.71 (2.07–3.56)	<0.001	2.17 (1.63–2.89)	<0.001

Abbreviations: CI = confidence interval; aOR = adjusted odds ratio; HBV = hepatitis B virus; HBV = hepatitis B virus.

^a Statistical significance level $p < 0.05$.^b Adjusted model: aOR comparing sex work in the past year to no sex work in the past year - adjusted for gender (overall only), age of participant, year of survey, and having injected in the past year.^c Symptom of an injection-site infection in the past 12 months includes abscess, sore, or open wound an at injection-site among those who have injected in the past year.^d Overdosed to the point of losing consciousness in the past 12 months.

for treating opioid overdose and training on administering naloxone and overdose prevention.⁴⁵

Nearly all PWID in our study reported health services contact in the past year. However, among women, more SWs reported accessing healthcare through A&E and UK National Health Service (NHS) walk-ins than did non-SWs, indicating that they might have more limited access to other healthcare options or that they are more likely to need urgent care. PWID and SWs have multiple support needs and may have to choose which to address first;⁸ they are at an increased risk of experiencing violence¹ which may lead them to accessing urgent care. A higher proportion of female SWs reported accessing A&E than non-SWs, possibly reflecting increased risk of more severe violence, injury, infection, or overdose. Services provided for SWs should form one arm of an inclusion health approach, i.e., policy, research, and commissioning of services that seek to address the varied intersecting structural factors causing health and social inequalities in the most vulnerable populations.^{46,47} The COVID-19 pandemic impacted sexually transmitted infection, HIV, and viral hepatitis services in England including a reduction in testing, vaccination, diagnosis, and treatment initiation,⁴⁸ while access to drug and alcohol services and other health care was more difficult for PWID in 2020 than in 2019.⁴⁹ It's essential that services remain accessible, are low-threshold, non-judgemental, trauma-aware,⁸ and continue to provide harm-reduction services.²⁸

There is currently no national-level system in place to measure sex work in the UK.⁵⁰ This research provides a national estimate of the prevalence of sex work amongst PWID in England, Wales, and Northern Ireland over the past 10 years. Sex work in the UK is complex and diverse; there are a wide range of setting, services, and motivations for engaging in sex work.^{8,50,51} Motivations range from economic need, caring responsibilities, monetary gain/need, deception, or coercion by third parties.⁵⁰ The UAM Survey does not collect data on the type or frequency of sex work engaged in. Only PWID in contact with a range of drug and alcohol were captured in the UAM Survey.

Whilst these include outreach, harm reduction, and treatment services, those most vulnerable and/or with limited access to services may have been missed. The results presented rely on self-reported risk behaviours, which may be subject to social desirability and recall bias; however, this was minimised through questionnaire self-completion and anonymity.⁵² The UAM Survey did not collect information on gender non-conformity or transgender status. Transgender SWs face a multitude of additional systemic health inequalities, increased stigma/discrimination, and structural barriers to accessing healthcare that puts them at risk.^{53,54}

Among PWID, we found higher levels of homelessness and adverse health outcomes, such as overdose and SSTIs, among those engaging in sex work than among those who were not. Our findings highlight the need for interventions tailored to the differences in the experience of PWID SWs by gender and sexuality. Healthcare and social care services need to follow an inclusion health approach. Continued surveillance of BBVs, injection-site infections, overdose, and behaviours in PWID by gender and across sub-population groups, including MSM, migrants, and SWs, is critical for the development of policy and interventions, and their evaluation.

Author statements

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Competing interests

The authors declare no competing interests.

References

- Ditmore MH. *When sex work and drug use overlap: considerations for advocacy and practice*. London, UK: Harm Reduction International; 2013.
- Rusakova M, Rakhmetova A, Strathdee SA. Why are sex workers who use substances at risk for HIV? *Lancet* 2015;**385**:211–2.
- Reeves A, Steele S, Stuckler D, McKee M, Amato-Gauci A, Semenza JC. National sex work policy and HIV prevalence among sex workers: an ecological regression analysis of 27 European countries. *The Lancet HIV* 2017;**4**:e134–40.
- Degenhardt L, Peacock A, Colledge S, Leung J, Grebely J, Vickerman P, et al. Global prevalence of injecting drug use and sociodemographic characteristics and prevalence of HIV, HBV, and HCV in people who inject drugs: a multistage systematic review. *Lancet Global Health* 2017;**5**:e1192–207.
- Medina-Perucha L, Family H, Scott J, Chapman S, Dack C. Factors associated with sexual risks and risk of STIs, HIV and other blood-borne viruses among women using heroin and other drugs: a systematic literature review. *AIDS Behav* 2019;**23**:222–51.
- Gilchrist G, Singleton N, Donmall M, Jones A. Prevalence and factors associated with sex trading in the year prior to entering treatment for drug misuse in England. *Drug Alcohol Depend* 2015;**152**:116–22.
- United Nations Office on Drugs and Crime. *World drug report 2020*. 2020.
- Matheson C, Bon L, Bowman L, Hannah A, MacLeod K. Vulnerability, risk and harm for people who use drugs and are engaged in transactional sex: learning for service delivery. *Int J Environ Res Publ Health* 2022;**19**:1840.
- Ogden S, Harris M, Childs E, Valente P, Edeza A, Collins A, et al. "You need money to get high, and that's the easiest and fastest way." A typology of sex work and health behaviours among people who inject drugs. *Int J Drug Pol* 2021;**96**:103285.
- Strathdee SA, Patrick DM, Currie SL, Cornelisse PGA, Rekart ML, Montaner JSG, et al. Needle exchange is not enough: lessons from the Vancouver injecting drug use study. *AIDS* 1997;**11**.
- Blouin K, Leclerc P, Morissette C, Roy É, Blanchette C, Parent R, et al. *Sex work as an emerging risk factor for human immunodeficiency virus seroconversion among people who inject drugs in the SurVUDI network*, vol. 43. Sexually Transmitted Diseases; 2016.
- Jarlais DCD, Arasteh K, McKnight C, Hagan H, Perlman DC, Semaan S. Associations between herpes simplex virus type 2 and HCV with HIV among injecting drug users in New York city: the current importance of sexual transmission of HIV. *Am J Publ Health* 2011;**101**:1277–83.
- Croxford S, Platt L, Hope VD, Cullen KJ, Parry JV, Ncube F. Sex work amongst people who inject drugs in England, Wales and northern Ireland: findings from a national survey of health harms and behaviours. *Int J Drug Pol* 2015;**4**: 429–33.
- Iversen J, Page K, Madden A, Maher L. HIV, HCV, and health-related harms among women who inject drugs: implications for prevention and treatment. *JAIDS J Acquired Immune Deficiency Syndromes* 2015;**69**:S176–81.
- Potter LC, Horwood J, Feder G. Access to healthcare for street sex workers in the UK: perspectives and best practice guidance from a national cross-sectional survey of frontline workers. *BMC Health Serv Res* 2022;**22**:178.
- Heinsbroek E, Glass R, Edmundson C, Hope V, Desai M. Patterns of injecting and non-injecting drug use by sexual behaviour in people who inject drugs attending services in England, Wales and Northern Ireland, 2013–2016. *Int J Drug Pol* 2018;**55**:215–21.
- Des Jarlais DC, Felemyer JP, Modi SN, Arasteh K, Hagan H. Are females who inject drugs at higher risk for HIV infection than males who inject drugs: an international systematic review of high seroprevalence areas. *Drug Alcohol Depend* 2012;**124**:95–107.
- Duriux-Smith A, Tw E, Goodman J. Comparison of female to male and male to female transmission of HIV in 563 stable couples. *BMJ* 1992;**304**:809.
- Shannon K, Strathdee SA, Goldenberg SM, Duff P, Mwangi P, Rusakova M, et al. Global epidemiology of HIV among female sex workers: influence of structural determinants. *Lancet* 2015;**385**:55–71.
- Jeal N, Salisbury C, Turner K. The multiplicity and interdependency of factors influencing the health of street-based sex workers: a qualitative study. *Sex Transm Infect* 2008;**84**:381–5.
- Roberts A, Mathers B, Degenhardt L. *Women who inject drugs: a review of their risks, experiences and needs. A report prepared on behalf of the Reference Group to the United Nations on HIV and Injecting Drug Use Australia Sydney*. National Drug and Alcohol Research Centre (NDARC), University of New South Wales; 2010.
- Baral SD, Friedman MR, Geibel S, Rebe K, Bozhinov B, Diouf D, et al. Male sex workers: practices, contexts, and vulnerabilities for HIV acquisition and transmission. *Lancet* 2015;**385**:260–73.
- Scheim A, Knight R, Shulha H, Nosova E, Hayashi K, Milloy MJ, et al. Characterizing men who have sex with men and use injection drugs in Vancouver, Canada. *AIDS Behav* 2019;**23**:3324–30.
- Bacon O, Lum P, Hahn J, Evans J, Davidson P, Moss A, et al. Commercial sex work and risk of HIV infection among young drug-injecting men who have sex with men in San Francisco. *Sex Transm Dis* 2006;**33**:228–34.
- Hegazi A, Lee M, Whittaker W, Green S, Simms R, Cutts R, et al. Chemsex and the city: sexualised substance use in gay bisexual and other men who have sex with men attending sexual health clinics. *Int J STD AIDS* 2017;**28**:362–6.
- Rashti R, Sharafi H, Alavian SM, Moradi Y, Mohamadi Bolbanabad A, Moradi G. Systematic review and meta-analysis of global prevalence of HBsAg and HIV and HCV antibodies among people who inject drugs and female sex workers. *Pathogens* 2020;**9**:432.
- Whitfield M, Reed H. *Integrated monitoring system annual report: cheshire and merseyside 2020/21*. 2021.
- British Association of Sexual Health and HIV (BASHH). *Clinical standards for the sexual health management of people involved in sex work*. 2022.
- UK Health Security Agency. *Unlinked Anonymous Monitoring (UAM) Survey of HIV and viral hepatitis among PWID: 2020 report*. 2020.
- UK Health Security Agency. *Shooting Up: infections and other injecting-related harms among people who inject drugs in the UK*. 2020. p. 2021.
- Elmes J, Stuart R, Grenfell P, Walker J, Hill K, Hernandez P, et al. Effect of police enforcement and extreme social inequalities on violence and mental health among women who sell sex: findings from a cohort study in London, UK. *Sex Transm Infect* 2022;**98**:323–31.
- UK Health Security Agency. *Hepatitis C in England*. In: *Working to eliminate hepatitis C as a public health problem*; 2022. 2022.
- Risher K, Mayer KH, Beyrer C. HIV treatment cascade in MSM, people who inject drugs, and sex workers. *Curr Opin HIV AIDS* 2015;**10**:420–9.
- UK Health Security Agency. *HIV testing, PrEP, new HIV diagnoses, and care outcomes for people accessing HIV services: 2022 report*. 2022.
- Brown A, Nash S, Connor N, Kirwan P, Ogaz D, Croxford S, et al. Towards elimination of HIV transmission, AIDS and HIV-related deaths in the UK. *HIV Med* 2018;**19**:505–12.
- Public Health England. *HIV in the United Kingdom: towards Zero HIV transmissions by 2030*. 2019 report. 2019.
- Agrahari V, Anderson SM, Peet MM, Wong AP, Singh ON, Doncel GF, et al. Long-acting HIV pre-exposure prophylaxis (PrEP) approaches: recent advances, emerging technologies, and development challenges. *Expert Opin Drug Deliv* 2022;**19**:1365–80.
- Grimshaw C, Boyd L, Smith M, Estcourt CS, Metcalfe R. Evaluation of an inner city HIV pre-exposure prophylaxis service tailored to the needs of people who inject drugs. *HIV Med* 2021;**22**:965–70.
- Wurcel AG, Burke D, Skeer M, Landy D, Heimer R, Wong JB, et al. Sex work, injection drug use, and abscesses: associations in women, but not men. *Drug Alcohol Depend* 2018;**185**:293–7.
- Lloyd-Smith E, Kerr T, Hogg RS, Li K, Montaner JSG, Wood E. Prevalence and correlates of abscesses among a cohort of injection drug users. *Harm Reduct J* 2005;**2**:24.
- Harris M, Scott J, Hope V, Wright T, McGowan C, Ciccarone D. Navigating environmental constraints to injection preparation: the use of saliva and other alternatives to sterile water among unstably housed PWID in London. *Harm Reduct J* 2020;**17**:24.
- Public Health England. *Wound aware: a resource for commissioners and providers of drug services*. 2021.
- Coffin PO, Galea S, Ahern J, Leon AC, Vlahov D, Tardiff K. Opiates, cocaine and alcohol combinations in accidental drug overdose deaths in New York City, 1990–98. *Addiction* 2003;**98**:739–47.
- Zibbell J, Howard J, Clarke SD, Ferrell A, Karon S. *Non-fatal opioid overdose and associated health outcomes: final summary report*, vol. 33. US Department of Health and Human Services; 2019.
- Public Health England. *Take-home naloxone for opioid overdose in people who use drugs*. 2017.
- Johnson L, Potter LC, Beeching H, Bradbury M, Matos B, Sumner G, et al. Interventions to improve health and the determinants of health among sex workers in high-income countries: a systematic review. *Lancet Public Health* 2023;**8**:e141–54.
- Luchenski S, Maguire N, Aldridge RW, Hayward A, Story A, Perri P, et al. What works in inclusion health: overview of effective interventions for marginalised and excluded populations. *Lancet* 2018;**391**:266–80.
- Public Health England. *The impact of the COVID-19 pandemic on prevention, testing, diagnosis and care for sexually transmitted infections, HIV and viral hepatitis in England*. 2020.
- Croxford S, Emanuel E, Ibitoye A, Njoroge J, Edmundson C, Bardsley M, et al. Preliminary indications of the burden of COVID-19 among people who inject drugs in England and Northern Ireland and the impact on access to health and harm reduction services. *Publ Health* 2021;**192**:8–11.
- Hester M, Mulvihill N, Matolcsi A, Sanchez AL, Walker S-JL. *The nature and prevalence of prostitution and sex work in England and Wales today*. 2019.

51. Matolcsi A, Mulvihill N, Lilley-Walker S-J, Lanau A, Hester M. The current landscape of prostitution and sex work in England and Wales. *Sex Cult* 2021;**25**:39–57.
52. Latkin CA, Vlahov D, Anthony JC. Socially desirable responding and self-reported HIV infection risk behaviors among intravenous drug users. *Addiction* 1993;**88**:517–26.
53. Nadal KL, Davidoff KC, Fujii-Doe W. Transgender women and the sex work industry: roots in systemic, institutional, and interpersonal discrimination. *J Trauma & Dissociation* 2014;**15**:169–83.
54. Brookfield S, Dean J, Forrest C, Jones J, Fitzgerald L. Barriers to accessing sexual health services for transgender and male sex workers: a systematic qualitative meta-summary. *AIDS Behav* 2020;**24**:682–96.