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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 Chi^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.

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 Chi^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 Chi^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.

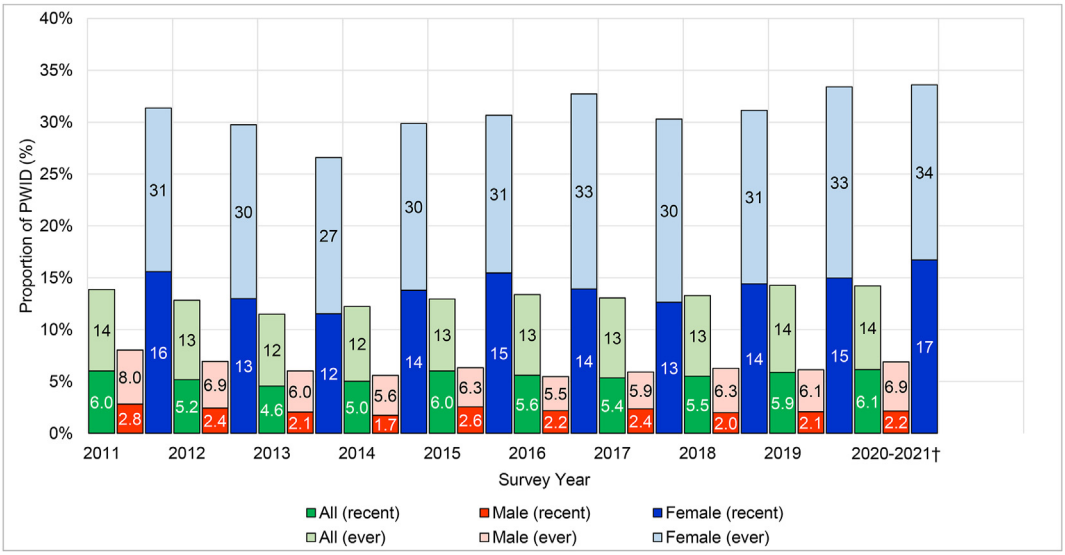

Fig. 1. Trends in self-reported ever and recent* engagement in sex work among PWID by gender: England, Wales and Northern Ireland, 2011–2021. Abbreviation: PWID = people who inject drugs. * Recent sex work was defined as reporting sex work in the past year. † Recruitment to the UAM Survey was impacted 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**

Recent HCV test		1006 (14%)	58 (14%)		754 (14%)	18 (18%)		250 (14%)	40 (13%)	
Never tested		2795 (40%)	157 (38%)		2058 (39%)	39 (39%)		727 (41%)	118 (37%)	
More than two years ago		3277 (46%)	204 (49%)	0.536	2430 (46%)	44 (44%)	0.610	790 (45%)	159 (50%)	0.200
Current or previous year		4982 (79%)	316 (82%)	0.185	3737 (80%)	78 (78%)	0.683	1230 (79%)	238 (84%)	**0.045**
HBV vaccination	Yes									
Health outcomes										
Any BBV (HIV/HBV/HCV)	Positive	3558 (56%)	204 (56%)	0.944	2639 (56%)	40 (46%)	0.051	908 (55%)	163 (59%)	0.199
HCV result	Antibody positive	3449 (54%)	197 (54%)	0.990	2565 (55%)	38 (44%)	**0.037**	873 (53%)	158 (58%)	0.170
HBV result	Antibody positive	560 (8.8%)	21 (5.8%)	**0.046**	418 (8.9%)	2 (2.3%)	**0.030**	142 (8.7%)	19 (6.9%)	0.344
HIV result	Positive	67 (1.1%)	7 (1.9%)	0.121	56 (1.2%)	3 (3.5%)	0.060	11 (0.67%)	4 (1.5%)	0.170
Symptom of injection-site infection[g]	Yes	1674 (41%)	177 (55%)	**<0.001**	1225 (39%)	44 (54%)	**0.007**	444 (46%)	133 (56%)	**0.005**
Overdosed in the past year	Yes	1115 (16%)	141 (34%)	**<0.001**	848 (16%)	41 (39%)	**<0.001**	260 (15%)	100 (32%)	**<0.001**

HBV – hepatitis B virus. HCV – hepatitis C virus.

[a] *P*-value – test of difference between SWs and non-SWs (Pearson's Chi^2).

[b] IQR – interquartile range.

[c] MSM – Men who have sex with men (non-exclusively).

[d] WSW - Women who have sex with women (non-exclusively).

[e] Reporting being under the influence of one or more drugs while having sex.

[f] Used a health service in the past year including General Practice (GP) (for drug use), sexual health clinic, NHS Walk-in, prison healthcare, Accident and Emergency (A&E), pharmacy.

[g] Symptom of an injection-site infection in the past year includes abscess, sore, or open wound an at injection site.

and sexually transmitted infections. Drugs used differed by gender; more male SWs reported using cocaine or amphetamines than non-SWs who often associated with chemsex (i.e., the use of specific drugs to enhance sexual experience). Among women, more SWs reported the use of crack cocaine during sex, in line with other literature reporting high rates of crack cocaine use among street-based SWs,[31] suggesting different motives for drug use pertaining to sex work: female SWs may experience a cycle of drug dependency and sex work to fund drug acquisition.[20]

In the recent years, chronic HCV infection in PWID in England has fallen due to the scale-up of direct-acting antiviral treatment; however, there has been an increase in PWID ever infected with HCV, indicating there is ongoing burden of infection and risk of transmission among PWID.[32] It is vital that PWID have access to regular BBV testing, treatment for infections such as HCV, and education on interventions to prevent reinfection.[32] SWs reported higher uptake of prevention interventions such as condom use, HBV vaccination, and BBV testing than non-SWs. As just 16% of male SWs and 25% of female SWs reported attending a SHS in the past year, it is likely these prevention interventions are being accessed through other healthcare services, which may not offer testing for other sexually transmitted infections or provide other prevention programmes such as HIV pre-exposure prophylaxis (PrEP). Furthermore, PWID may not divulge they are engaging in sex work in these settings.[33]

Male SWs had higher odds of having HIV than non-SWs, likely related to an elevated prevalence of HIV among MSM overall, with a reported prevalence of 88 per 1000 (credible interval 77–102) among MSM in England aged 15–74 in 2018.[34–36] The UAM Survey does not collect any information on PrEP use in PWID. There is evidence globally that SHSs may focus prevention efforts on MSM and the general population, whilst vulnerable female groups, including SWs, are inadvertently excluded.[8] PWID engaging in sex work need access to tailored, free, and confidential sexual and reproductive health services and combination prevention, such as long-acting PrEP and anti-retroviral therapy, where applicable,[37,38] to support healthcare relating to injecting drug use.

Sex work in all PWID irrespective of gender was associated with increased risk of injection-site infections, supporting previous research which found higher odds of abscess among women who inject and sell sex.[13,39] Use of unsterile injecting equipment, impurities in drugs, and decreased wound healing from poor vein health can lead to increased risk of SSTIs among PWID.[39,40] The increased risk seen among SWs could be due to multiple factors, including the observed higher rates of sharing needles/syringes and homelessness, and the types of drugs being injected. If SWs are working and injecting on the street, they may not have access to clean water for preparing their injections or for washing their hands or injection sites, leading to an increased risk of SSTIs.[41] A large proportion of female SWs reported injecting crack, which is a risk factor for abscess.[39] It is critical that the needle/syringe provision matches the demand and access to sterile injecting equipment is increased, as well as access to sterile water for injection, antimicrobial handwipes as an alternative to handwashing, and alcohol swabs to clean injection sites.[41,42]

We found that sex work was associated with overdosing in the past year, with one in three SWs reporting this. In our study, a higher proportion of SWs reported non-injecting use of heroin, crack, powder cocaine, and/or amphetamine than non-SWs. Previous research has shown an association between polydrug use and increased risk of overdose.[43] Non-fatal opioid overdose is associated with a range of short- and long-term health consequences mainly stemming from potential hypoxia and respiratory depression.[44] It's vital that PWID have easy access to take-home naloxone

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 violence[1] 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 subpopulation groups, including MSM, migrants, and SWs, is critical for the development of policy and interventions, and their evaluation.

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Competing interests

The authors declare no competing interests.

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