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Factors Associated with Exchange Sex Among Cisgender Persons Who Inject Drugs: Women and MSM—23 U.S. Cities, 2018

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Abstract

Persons who inject drugs (PWID) and exchange sex face disproportionate HIV rates. We assessed prevalence of exchange sex (receiving money/drugs for sex from ≥ 1 male partner(s) during the past year) among cisgender PWID, separately for women and men with a history of sex with men (MSM). We examined factors associated with exchange sex, including sociodemographic characteristics, sexual and drug use behaviors, and healthcare access/utilization. Over one-third of the 4657 participants reported exchange sex (women: 36.2%; MSM: 34.8%). Women who exchanged sex (WES) were significantly more likely to test HIV-positive than other women. Men who exchanged sex with men (MESM) showed a similar trend. WES and MESM shared many characteristics, including being uninsured, experiencing recent homelessness, condomless sex, polydrug use, and receptive/distributive needle sharing. These findings highlight a need to strengthen prevention interventions and address structural determinants of HIV for WES and MESM, particularly PWID who exchange sex.

Keywords

Injection drug use; STI risk; HIV risk; Exchange sex; Sex work

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Consent to Participate Informed consent was obtained from all individual participants included in the study.

Consent for Publication Not applicable.

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Introduction

The United States is in the midst of an unprecedented opioid epidemic, which has led to new challenges for HIV prevention [1–4]. In 2018, persons who inject drugs (PWID) accounted for approximately 1 in 15 HIV diagnoses in the United States [5]. Among PWID, exchanging sex for money or drugs is linked to increased risk of having and/or acquiring an HIV infection [6, 7]. Based on 2018 data from CDC's National HIV Behavioral Surveillance (NHBS), 27% of PWID exchanged sex for money or drugs during the previous year, with a higher proportion of PWID living with HIV reporting exchange sex than PWID who tested negative for HIV (37% vs. 26%) [8]. These figures were nearly identical in 2015 [9], indicating ongoing high prevalence of exchange sex practices among PWID. While research using the 2009 NHBS data among PWID provide some insights into factors associated with exchange sex among women who inject drugs [10], we are not aware of any multicity studies that explore factors associated with exchange sex among MSM who inject drugs. Additional research with more recent data is needed to elucidate factors associated with exchange sex among PWID and to strengthen intervention programs for PWID engaged in exchange sex. The ongoing national opioid epidemic [2], localized increases in injection drug use (IDU) [11, 12], and recent HIV outbreaks linked to IDU among PWID [1, 4], all add urgency to mitigating HIV risks in this population.

To date, much of the literature on exchange sex has focused on female sex workers. Several reports document biological, behavioral, and structural factors that affect HIV and STI risk among women who receive money or drugs in exchange for sex [13–15]. For example, due to unequal power dynamics related to social or financial position in the context of exchange sex, women may not be able to negotiate condom use during sexual transactions out of concern of violence or decreased pay. Drug use and dependency could further compound these risks. An analysis of the 2009 NHBS data showed that 39% of women who inject drugs reported receiving money/drugs for sex in the previous 12 months [10]. Among women who reported IDU, those who exchanged sex were more likely to be socially disadvantaged, to have both sexual and IDU risks, and to be unaware of their positive HIV status than those who did not exchange sex [10].

Less is understood about factors associated with exchange sex among men, particularly among men who *receive* money or drugs in exchange for sex with other men. This may be in part due to stigmatization around same-sex practices as most clients of men who exchange sex are male [16, 17]. In the United States, men who have a history of sex with men (MSM) are disproportionately affected by HIV, accounting for 66% of new HIV diagnoses in 2019 [18]. A few studies identified IDU and polydrug use as risk factors for exchange sex among MSM [19]. Estimates for exchange sex among U.S. MSM vary widely (e.g., 7% among MSM across 20 U.S. metropolitan areas [19]; 18% among MSM who inject drugs in the New York metropolitan area [20]); however, there are currently no multicity estimates available for exchange sex among MSM who inject drugs.

Several countries have demonstrated benefits of HIV interventions for sex workers [21], and although this topic has received relatively little attention in the United States, it offers a potential application for PWID engaged in exchange sex in the United States. Projects in

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Asian and African countries have demonstrated how policy changes [15] and harm reduction programs [22] can reduce the burden of HIV and STIs among sex workers. Understanding determinants of exchange sex among PWID, including similarities and differences between women and MSM who exchange sex, will help guide future directions for domestic efforts aimed at lowering HIV prevalence among PWID who exchange sex, and potentially sex workers more broadly, in the United States. For example, it is not yet clear from the literature whether cisgender women and MSM who exchange sex face similar or different challenges, and whether these subpopulations could benefit from combined harm reduction programs or whether separate programs with messaging tailored for each subpopulation may be more beneficial.

We assessed the prevalence of exchange sex among two cisgender PWID subpopulations: women and MSM. We also examined factors associated with exchange sex, including sociodemographic characteristics, sexual and drug use behavioral factors, HIV/STI diagnoses, and healthcare access/utilization. Where possible, we selected and categorized variables following Nerlander et al. 2017 [10], a study which analyzed exchange sex among cisgender women who inject drugs using NHBS data from 2009. By using similar variables and categories across 2009 and 2018 NHBS datasets, our results can be compared to those of women who responded to an almost identical survey nearly a decade prior.

Notably, our study population included PWID who exchange sex. These individuals may not necessarily be representative of the broader sex worker community as our data did not differentiate among types of exchange sex (e.g., sex work, survival sex, transactional sex). Given the paucity of literature on exchange sex among PWID in the United States, especially regarding harm reduction programs for this population, we draw upon literature about the global sex worker community when interpreting our findings, while taking care to acknowledge nuances between these populations. To help readers discern these two populations, we use the terminology “exchange sex” in reference to behaviors of our study respondents, and we retain the terminology of cited literature when discussing findings from other studies (e.g., either “sex work” or “exchange sex” depending on how authors described their study). Based on our findings, we discuss evidence-based interventions addressing needs of sex workers within the global framework of community-empowerment approaches as a potential application to PWID engaged in exchange sex in the United States.

Methods

Study Participants and Procedures

We analyzed data from PWID recruited during the 2018 NHBS cycle among PWID. Details about NHBS data collection methods and eligibility criteria are described elsewhere [23, 24]. Briefly, the 2018 cycle was conducted in 23 metropolitan statistical areas (MSAs) [8], which represented 59% of all diagnosed HIV infections in urban areas with a population of ≥ 5,000,000 by year-end 2016. Respondent-driven sampling (RDS), a peer-driven sampling method commonly used to survey highly stigmatized populations, was employed to recruit study participants [25]. Each NHBS site selected initial recruits (referred to as seeds) from the local PWID population [26, 27]. After participating in the NHBS survey, seeds were invited to recruit up to 5 PWID they knew personally. Those recruits who completed the

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NHBS survey were in turn invited to recruit others using a coded coupon system. This chain referral sampling approach continued until the sample size was reached or the sampling period ended. Participants received incentives for recruitment and survey participation.

Eligible and consenting recruits participated in an anonymous face-to-face survey with trained NHBS staff and were offered anonymous HIV testing and referrals as needed. Eligibility criteria included: having injected non-prescribed drugs in the previous 12 months with physical evidence of recent injection or sufficient knowledge of injection practices, being at least 18 years old, residing in the defined MSA for data collection, being able to complete the survey in English or Spanish, and being a first-time participant in the study cycle. Blood specimens were collected for rapid HIV testing in the field or laboratory-based testing. Non-reactive rapid tests were considered HIV-negative, whereas reactive rapid tests were considered HIV-positive if confirmed by supplemental testing. NHBS was reviewed by applicable local institutional review boards in each participating project area.

Measures

Outcome Variable—The outcome variable “exchange sex” was defined as receiving money or drugs in exchange for sex from one or more male casual partners in the previous 12 months. For women participants, sex referred to vaginal, oral, or anal sex with 1 or more male partners. For MSM participants, sex referred to oral or anal sex with 1 or more male partners.

Independent Variables—We examined a range of sociodemographic and biobehavioral variables. Sociodemographic variables included: age, highest level of education, race/ethnicity (Black, Hispanic/Latino, White, other/multiple), employment (yes/no), income below the 2018 federal poverty level (yes/no), health insurance status (yes/no), and recent experience of homelessness (yes/no) or incarceration (yes/no). Potential mental illness severity was assessed using the Kessler-6 (K6) screening scale—a six-item screening tool for nonspecific psychological distress and/or mental illness severity based on the Diagnostic and Statistical Manual of Mental Disorders 4th Edition [28]. Homelessness was defined as living on the street, in a shelter, single-room-occupancy hotel, or in a car in the previous 12 months. Incarceration referred to being held in a jail, prison, or detention center for more than 24 h in the previous 12 months.

Sexual behavioral factors included: condomless sex during the previous 12 months (yes/no), number of condomless anal sex partners during the previous 12 months, whether the participant reported being diagnosed with a bacterial STI (chlamydia, gonorrhea, or syphilis) during the previous 12 months (yes/no), whether the last sex partner had ever injected drugs (yes/no), and the last sex partner’s HIV status (negative, positive, unknown). Data about the last sex partner’s IDU and HIV status relied on the participant’s response to relevant questions about their most recent sexual partner.

We examined several drug use behaviors. Years since first injection was based on a participant’s report of when they first injected drugs not prescribed to them; we grouped this continuous variable into categories (classified as 0–3 years, 4–6 years, ≥ 7 years), following the classification scheme of Nerlander et al. [10], which examined characteristics of women

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who inject drugs using similar NHBS data, to allow for cross-sectional comparison. We also assessed injection frequency (more than once a day, once a day, more than once a week, once a week or less), participation in receptive syringe sharing (i.e., using a syringe after it was used by someone else; yes/no) or distributive syringe sharing (i.e., giving someone a syringe to use after already using it for injection; yes/no) during the previous 12 months, most frequently injected drug(s), noninjection crack cocaine use during the previous 12 months (yes/no), noninjection methamphetamine use during the previous 12 months (yes/no), and binge-drinking alcohol during the previous 30 days (yes/no). Binge drinking referred to consuming ≥ 5 drinks (men) or ≥ 4 drinks (women) in a 2-h period during the previous 30 days. Finally, we examined recent nonfatal opioid overdose (yes/no). Nonfatal overdose referred to passing out, turning blue, or stopping breathing from heroin or painkiller use during the previous 12 months.

Variables that measured utilization of health services included: whether the participant had been screened for HIV in the previous 12 months, taken medications for opioid use disorder (MOUD) in the previous 12 months (yes/no), visited any healthcare provider in the previous 12 months (yes/no), or received behavioral HIV intervention services in the previous 12 months (yes/no). NHBS also conducted HIV testing for consenting participants (positive/negative). Participants were considered to have used MOUD if they used opioids and reported medicines like methadone, buprenorphine, Suboxone, or Subutex to treat drug use in the previous 12 months. Behavioral HIV intervention services were defined as organized group discussions or one-on-one conversations with skilled professional(s) (e.g., outreach worker, counselor, prevention program worker) about ways to prevent HIV.

Analyses

Participants who consented to an HIV test and interview were included in the analysis if they identified as a woman or man. We excluded male participants who did not report any previous history of sex with other men. We also excluded individuals who identified as transgender, due to small sample size.

Descriptive analyses of sample characteristics were conducted and stratified by sex. We used log-linked Poisson regression models with generalized estimating equations (GEE) to examine factors associated with exchange sex among PWID by sex. We report Chi-square test statistics and associated p-values based on Wald statistics for Type 3 GEE. Analyses accounted for RDS sampling methods by clustering on recruitment chain and adjusting for city and participant network size. All analyses were conducted using SAS 9.4 (SAS Institute Inc., Cary, NC, USA) and statistical significance was set at $p \leq 0.05$.

Results

The analysis sample totaled 4,657 PWID (3391 women and 1266 MSM). In total, 1668 study participants (35.8%) reported exchanging sex during the previous 12 months, with similar frequencies for women who exchanged sex (WES: n = 1227, 36.2%) and men who exchanged sex with men (MESM: n = 441, 34.8%) (results not shown in tables).

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Sociodemographic Factors

Within both subgroups of PWID (women and MSM), exchange sex was most prevalent among Black and Hispanic/Latino individuals, with the highest prevalence among women aged 25–49 and MSM aged 18–39. Exchange sex was more common among those who were uninsured versus insured (WES: 45.7% vs. 33.3%, $X^2 = 17.65$, $p < 0.001$; MESM: 43.3% vs. 31.6%, $X^2 = 5.8$, $p = 0.016$; Table 1). Exchange sex was also more common among those who experienced homelessness in the previous 12 months (WES: 41.8% vs. 25.2%, $X^2 = 107.29$, $p < 0.001$; MESM: 39.6% vs. 17.2%, $X^2 = 24.14$, $p < 0.001$), or had K6 scores that indicated probable severe psychological distress (WES: 44.6% vs. 30.2%, $X^2 = 70.37$, $p < 0.001$; MESM: 42.8% vs. 29.4%, $X^2 = 35.28$, $p < 0.001$).

Among women who inject drugs, exchange sex was also more common if they were unemployed (37.2% vs. 29.2%, $X^2 = 11.45$, $p < 0.001$; Table 1), recently incarcerated (42.5% vs. 33.4%, $X^2 = 46.65$, $p < 0.001$), or had a low level of education ($X^2 = 26.63$, $p < 0.001$). Among MSM, exchange sex was not associated with education ($X^2 = 0.76$, $p = 0.683$), employment status ($X^2 = 1.31$, $p = 0.253$), or incarceration history ($X^2 = 1.49$, $p = 0.222$).

Sexual Factors

Overall, a high percentage of women and MSM in the study population reported condomless sex (women: 90.1%, MSM: 85.6%). Compared to women and MSM who did not exchange sex, respectively, WES and MESM were more likely to have ≥ 4 condomless anal sex partners in the past 12 months (women: 7.5% vs. 0.7%; MSM: 37.2% vs. 12.2%; Table 2), and to be less aware of their most recent sexual partner's HIV status (women: 57.3% vs. 33.4%, MSM: 63.3% vs. 48.5%). Finally, WES and MESM were significantly more likely than their non-exchanging counterparts to report a bacterial STI during the previous 12 months (women: 13.4% vs. 5.1%, $X^2 = 90.35$, $p < 0.001$; MSM: 12.7% vs. 6.1%, $X^2 = 17.96$, $p < 0.001$). More women who did not exchange sex reported that their last partner had ever injected drugs than WES (54.6% vs. 74.7%, $X^2 = 77.55$, $p < 0.001$).

Drug Use Factors

A majority of the participants injected drugs more than once per day (women: 80.9%; MSM: 71.9%) and had injected drugs for at least 7 years (women: 73.0%; MSM: 81.8%). Polydrug use was high among PWID sampled, with heroin indicated as the drug injected most frequently (women: 58.5%; MSM: 39.4%), and multiple types of drugs reported by both women (15.5%) and MSM (22.5%). There were also high percentages of noninjection crack-cocaine use among PWID (women: 49.5%; MSM: 53.0%) and noninjection methamphetamine use (women: 35.1%; MSM: 50.7%).

Compared with those who did not exchange sex, persons who exchanged sex were more likely to report receptive syringe sharing (women: 44.0% vs. 31.3%, $X^2 = 67.41$, $p < 0.001$; MSM: 53.3% vs. 40.1%, $X^2 = 14.16$, $p < 0.001$; Table 2) and distributive syringe sharing (women: 55.1% vs. 42.0%, $X^2 = 62.88$, $p < 0.001$; MSM: 59.0% vs. 47.3%, $X^2 = 15.04$, $p < 0.001$). Compared to those who did not exchange sex, a greater percentage of WES and MESM reported binge drinking (women: 36.3% vs. 21.5%, $X^2 = 63.41$, $p < 0.001$; MSM:

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42.2% vs. 27.1%, $X^2 = 21.50$, $p < 0.001$). Other drug use behaviors were significantly more prevalent among WES than women who did not exchange sex: noninjection crack cocaine use (66.0% vs. 40.2%, $X^2 = 107.03$, $p < 0.001$) and nonfatal overdoses (36.4% vs. 24.8%, $X^2 = 46.99$, $p < 0.001$). Noninjection crack cocaine ($X^2 = 2.40$, $p = 0.121$) and nonfatal overdoses ($X^2 = 3.01$, $p = 0.083$) did not differ significantly by exchange sex among MSM.

HIV Status, Testing and Health Services

WES tested HIV-positive at higher proportion than women who did not exchange sex (8.0% vs. 4.8%, $X^2 = 7.91$, $p = 0.005$; Table 2), and MESM showed a similar trend though results were not statistically significant (17.5% vs. 14.6%, $X^2 = 1.79$, $p = 0.181$). Most participants reported visiting a health care provider in the past year (women: 82.8%, MSM: 80.1%); however, large proportions of women and MSM reported *not* being screened for HIV in the past year, both among those who exchanged sex and those who did not (women: 37.1% vs. 44.8%, $X^2 = 7.80$, $p = 0.020$, MSM: 40.3% vs. 35.8%, $X^2 = 3.54$, $p = 0.171$).

Just over half of the women and nearly half of the men who used opioids had taken MOUD during the past 12 months, regardless of whether they had exchanged sex or not (women: 54.5% vs. 54.3%, $X^2 = 0.26$, $p = 0.608$; MSM: 40.3% vs. 46.7%, $X^2 = 2.42$, $p = 0.120$; Table 2). Approximately a third of participants received individual or group HIV counseling during the past 12 months, with no difference by exchange sex (women: 36.4% vs. 32.0%, $X^2 = 2.49$, $p = 0.114$; MSM: 32.4% vs. 33.0%, $X^2 = 0.09$, $p = 0.761$).

Discussion

We found that over a third of PWID reported exchanging sex during the previous 12 months, with similar prevalence among women and MSM. Male sex workers who inject drugs remain an understudied population and are underserved by HIV treatment and care services [16]. Despite mounting evidence of sizeable populations of male sex workers around the globe [16], the myth that all sex workers are female has largely persisted [29]. Through documenting a similar prevalence of exchange sex among cisgender women and MSM who inject drugs, our findings from a large U.S.-based surveillance system provide further evidence in support of debunking this myth. To our knowledge, our study provides the first multicity comparison of exchange sex among women and MSM who inject drugs. Our analyses among PWID revealed that women and MSM shared many of the same factors associated with exchange sex, including socioeconomic factors (e.g., being uninsured or experiencing recent homelessness), sexual factors (condomless sex, multiple condomless anal sex partners, having a recent partner with a positive or unknown HIV status), and drug use factors (polydrug use, receptive needle sharing and distributive needle sharing). Additionally, HIV and recently reported bacterial STIs were more prevalent among WES and MESM as compared to women and MSM who did not exchange sex. Our findings likely reflect challenges faced by WES and MESM, which are associated with the intersectionality of stigmas from injection drug use, sex work, and being presumed to be living with HIV, among other potential social determinants of health such as race, sexual identity, poverty, and/or housing instability [3, 30, 31]. When set against the backdrop of sex work and exchange sex often being considered illegal in the vast majority of the United States, and in

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much of the world, these various factors create a multilayered landscape of marginalization for WES and MESM who inject drugs [16].

While a growing body of international research and grassroots projects have demonstrated numerous benefits of HIV prevention programs for sex workers abroad [32–34], few programs of this nature exist in the United States. This is in part due to stigmatization and criminalization of prostitution and injection drug use in the United States. We hope our findings will serve as a call to action for increased focus and attention on evidence-based HIV prevention relevant to all PWID engaged in exchange sex, with the goal of reducing the HIV and STI prevalence in this population. Two key approaches for reaching this goal include: 1) innovative on-the-ground HIV intervention programs for PWID, sex workers, and PWID who exchange sex, and 2) policy changes to decriminalize exchange sex.

In 2019, the United States Department of Health and Human Services (HHS) launched the initiative *Ending the HIV Epidemic in the U.S.* (EHE), which leverages longstanding, evidence-based programs with the goal of reducing new HIV infections in the United States by 90% by the year 2030. This initiative has a special focus on key populations with a high HIV burden, including PWID [35]. HIV prevention tools for PWID include MOUD [36], HIV treatment-as-prevention [37], pre-exposure prophylaxis (PrEP) [38], and syringe services programs (SSPs) [8, 39–42]. In particular, SSPs can provide essential harm-reduction services for PWID, such as sterile syringes and other injection equipment, safe disposal of syringes, safe sex materials, HIV counseling and testing, overdose education, overdose prevention (Narcan), and linkage to MOUD and care [41, 43, 44]. While the HIV National Strategic Plan (2021–2025) proposes several strategies for tackling the HIV epidemic among PWID, there is little discussion about how to reduce HIV risks for individuals who engage in exchange sex [45, 46].

A global experience and perspective of innovative programs can offer guidance and hope for human-rights affirming HIV interventions among sex workers, with potential applications to PWID engaged in exchange sex. Community-empowerment-based responses have shown promise in several countries [21, 46]. Through such programs, sex workers take collective ownership of projects to address barriers to their own health and human rights, oftentimes with a key goal of reducing the HIV burden in their communities [21]. The vast majority of community empowerment-based programs focus on female sex workers, highlighting a need to increase access for male and transgender sex workers. Notably, community-empowerment approaches are focused on ensuring the health and human rights of sex workers as workers, rather than “rescuing” or pushing them out of their profession. Within this umbrella approach, projects around the globe offer myriad HIV intervention activities including HIV prevention, treatment, or care strategies [47–50]. For example, randomized trials in Iringa, Tanzania demonstrated that community empowerment-based combination HIV prevention (such as the establishment of a community-led drop-in center and a text messaging system that promoted community support, solidarity, and ART adherence) significantly improved HIV incidence and care continuum outcomes among WES, with greater levels of exposure to interventions being strongly associated with positive health outcomes like viral suppression [47]. Similarly, in a systematic review of 22 studies across three countries (India, Brazil, and the Dominican Republic), Kerrigan et al. [21] found

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that community empowerment-based approaches for HIV interventions were significantly associated with decreased HIV and STI infections among sex workers, as well as increased condom use among clients. While not always focused specifically on PWID, existing community-empowerment approaches for sex workers could offer valuable insights for U.S.-based programs aimed at PWID who exchange sex.

Persons who inject drugs and exchange sex have unique vulnerabilities to HIV beyond non-injection drug users who exchange sex. For example, substance use among WES has been linked to increased odds of workplace violence, condomless sex, and HIV infection [51, 52]. A few U.S. based grass roots organizations offer harm reduction services specifically for PWID who identify as sex workers, with notable examples including HIPS (https://www.hips.org/) in Washington, D.C., and the St. James Infirmary (https://www.stjamesinfirmary.org/) in San Francisco. Some SSPs also designate specific times for female-identified persons to receive harm reduction services related to exchange sex. However, broadscale access to harm reduction services for PWID engaged in sex work/exchange sex remains limited in the United States [3, 41, 53, 54], and when available, these services tend to target WES, with less focus on MESM.

Given the progress with international community empowerment-based projects at the local level, some HIV researchers are calling for policy changes that could aid in the broader implementation of these projects for sex workers and PWID who exchange sex [15, 21, 46]. Criminalization of sex work remains a structural determinant of HIV risk [15, 46, 55, 56] and a key barrier for implementing and scaling up prevention, treatment, and community empowerment-based responses to HIV among sex workers [21, 46, 57]. In 2016, Amnesty International called on countries to decriminalize consensual sex work (clearly distinguishing it from commercial coercive sexual exploitation), citing that criminalization leaves sex workers vulnerable to human rights abuses including violence, rape, and exclusion from health services [58]. Buying and selling sex remains illegal throughout most of the United States, with the exception of a few counties in Nevada [59]. Depending on the state, financial penalties for selling sex can range from $500 to $150,000 per offense with the possibility of felony charges and/or jail time for offenders (e.g., up to 5 years in Idaho) [59]. These penalties can lead already impoverished individuals into vicious cycles of poverty, incarceration, housing instability, and limited access to and/or utilization of medical care or prevention services [58, 60, 61]. Indeed, our data showed that among women who inject drugs, those who exchanged sex were more likely to have a history of recent incarceration than those who did not. Fear of penalization has led many sex workers to engage in riskier exchanges, increasing their vulnerability to violence and/or HIV and STIs [55, 60, 62–64]. Fear of criminalization for injection drug use on top of criminalization for exchange sex could further compound these issues among PWID who exchange sex. Modeling estimates indicate that decriminalizing sex work could avert 33–46% of HIV infections in sex workers and clients over a 10-year period [15]. Adopting policies aimed at decriminalizing consensual sex work could lower health and safety risks for this vulnerable population, including reducing their prevalence of HIV and STIs [15, 32, 46].

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Limitations

Participants for this study were recruited from 23 U.S. MSAs with high HIV prevalence; thus, our findings may not be representative of PWID in other parts of the United States. Our analyses did not account for access to or use of SSPs. Our data do not account for reasons for exchanging sex other than money or drugs, which could lead to underestimates of exchange sex. Similarly, because exchange sex data relied on self-reported information, we cannot rule out social desirability bias; however, other studies have shown reliability and validity in self-reporting of sensitive behaviors among PWID [65]. As a cross-sectional study, we cannot infer causality between exchange sex and HIV acquisition or risk behaviors. Our analyses focused on examining relationships between exchange sex and various factors, while controlling for sampling design; future analyses could investigate interrelationships between exchange sex and key factors identified here, as well as explore and fine-tune how to incorporate these findings into local community-empowerment based interventions tailored to specific U.S. cities and PWID populations. Finally, although we assessed factors relating to social determinants of health (e.g., poverty, employment, incarceration), we did not have data to analyze effects of perceived stigma or discrimination.

Conclusions

We found similar prevalence of and factors associated with exchange sex among both women and MSM who inject drugs, suggesting that both WES and MESM who inject drugs likely face common challenges and stigmas related to IDU, exchange sex, HIV status, poverty, housing instability, race/ethnicity, sexual identity and/or other social determinants of health. Our findings indicate that both WES and MESM should be considered in HIV interventions among PWID. While a few programs in the United States offer harm reduction services specifically aimed at PWID engaged in sex work, recent studies indicate that broadscale access to such services in the United States remains limited. Data from abroad demonstrates the potential success of community-empowerment-based responses in reducing HIV prevalence among sex workers, with potential applications to PWID engaged in exchange sex in the United States. However, criminalization of exchange sex remains a barrier to the broader implementation and scale-up of these programs. To reduce HIV risks among PWID engaged in exchange sex, it will be important to focus not only on programs for testing, treating, and preventing HIV, but also on programs that increase access to tailored harm reduction services, as well as activities aimed at addressing the legal obstacles and pervasive discrimination faced by WES and MESM.

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Data Availability

Please send data use requests to NHBS@cdc.gov. A summary of the data is available via a recent CDC surveillance report: http://www.cdc.gov/hiv/library/reports/hiv-surveillance.html.

References

1. Alpren C, Dawson EL, John B, et al. Opioid use fueling HIV transmission in an urban setting: an outbreak of HIV infection among people who inject drugs—Massachusetts, 2015–2018. Am J Public Health. 2020;110(1):37–44. [PubMed: 31725317]
2. Hodder SL, Feinberg J, Strathdee SA, et al. The opioid crisis and HIV in the USA: deadly synergies. Lancet. 2021;397(10279):1139–50. [PubMed: 33617769]
3. Board A, Alpren C, Hernandez B, et al. A qualitative study of injection and sexual risk behavior among unstably housed people who inject drugs in the context of an HIV outbreak in Northeast Massachusetts, 2018. Int J Drug Policy. 2021;95: 103368. [PubMed: 34390967]
4. Peters PJ, Pontones P, Hoover KW, et al. HIV infection linked to injection use of oxymorphone in Indiana, 2014–2015. N Engl J Med. 2016;375(3):229–39. [PubMed: 27468059]
5. Centers for Disease Control. HIV Surveillance Report, 2018 (Updated). 2020;31.
6. Astemborski J, Vlahov D, Warren D, Solomon L, Nelson KE. The trading of sex for drugs or money and HIV seropositivity among female intravenous drug users. Am J Public Health. 1994;84(3):382–7. [PubMed: 8129052]
7. Blouin K, Leclerc P, Morissette C, et al. Sex work as an emerging risk factor for human immunodeficiency virus seroconversion among people who inject drugs in the SurvUDI Network. Sex Transm Dis. 2016;43(10):648–55. [PubMed: 27631361]
8. Centers for Disease Control and Prevention. HIV Infection Risk, Prevention, and Testing Behaviors among Persons Who Inject Drugs—National HIV Behavioral Surveillance: Injection Drug Use, 23 U.S. Cities, 2018. HIV Surveillance Special Report. 2020.
9. Centers for Disease Control and Prevention. HIV Infection, Risk, Prevention, and Testing Behaviors among Persons Who Inject Drugs—National HIV Behavioral Surveillance: Injection Drug Use, 20 U.S. Cities, 2015. HIV Surveillance Special Report. 2018.
10. Nerlander LM, Hess KL, Rose CE, et al. Exchange sex and HIV infection among women who inject drugs—20 US cities, 2009. J Acquir Immune Defic Syndr. 2017;75(Suppl 3):S333. [PubMed: 28604435]
11. Brighthaupt S-C, Schneider KE, Johnson JK, Jones AA, Johnson RM. Trends in adolescent heroin and injection drug use in nine urban centers in the U.S., 1999–2017. J Adolesc Health. 2019;65(2):210–5. [PubMed: 31331542]

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

12. HIV/AIDS Epidemiology Unit Public Health—Seattle & King County and the Infectious Disease Assessment Unit. HIV/AIDS Fact Sheet: People Who Inject Drugs (PWID) HIV/AIDS Epidemiology Report 2020. 2020.
13. Baral S, Beyrer C, Muessig K, et al. Burden of HIV among female sex workers in low-income and middle-income countries: a systematic review and meta-analysis. Lancet Infect Dis. 2012;12(7):538–49. [PubMed: 22424777]
14. Park JN, Footer KH, Decker MR, et al. Interpersonal and structural factors associated with receptive syringe-sharing among a prospective cohort of female sex workers who inject drugs. Addiction. 2019;114(7):1204–13. [PubMed: 30694587]
15. Shannon K, Strathdee SA, Goldenberg SM, et al. Global epidemiology of HIV among female sex workers: influence of structural determinants. Lancet. 2015;385(9962):55–71. [PubMed: 25059947]
16. Baral SD, Friedman MR, Geibel S, et al. Male sex workers: practices, contexts, and vulnerabilities for HIV acquisition and transmission. Lancet. 2015;385(9964):260–73. [PubMed: 25059939]
17. Baral SD, Poteat T, Strömdahl S, Wirtz AL, Guadamuz TE, Beyrer C. Worldwide burden of HIV in transgender women: a systematic review and meta-analysis. Lancet Infect Dis. 2013;13(3):214–22. [PubMed: 23260128]
18. Centers for Disease Control and Prevention. Estimated HIV incidence and prevalence in the United States, 2015–2019. HIV Surveillance Supplemental Report. 2021.
19. Nerlander LM, Hess KL, Sionean C, et al. Exchange sex and HIV infection among men who have sex with men: 20 US cities, 2011. AIDS Behav. 2017;21(8):2283–94. [PubMed: 27307181]
20. Walters SM, Rivera AV, Reilly KH, et al. Exchange sex among persons who inject drugs in the New York metropolitan area: the importance of local context, gender and sexual identity. AIDS Behav. 2018;22(9):2773–87. [PubMed: 29468492]
21. Kerrigan D, Kennedy CE, Morgan-Thomas R, et al. A community empowerment approach to the HIV response among sex workers: effectiveness, challenges, and considerations for implementation and scale-up. Lancet. 2015;385(9963):172–85. [PubMed: 25059938]
22. Bekker L-G, Johnson L, Cowan F, et al. Combination HIV prevention for female sex workers: what is the evidence? Lancet. 2015;385(9962):72–87. [PubMed: 25059942]
23. Lansky A, Abdul-Quader AS, Cribbin M, et al. Developing an HIV behavioral surveillance system for injecting drug users: the National HIV Behavioral Surveillance System. Public Health Rep. 2007;122(1_suppl):48–55.
24. Gallagher KM, Sullivan PS, Lansky A, Onorato IM. Behavioral surveillance among people at risk for HIV infection in the US: the National HIV Behavioral Surveillance System. Public Health Rep. 2007;122:32–8. [PubMed: 17354525]
25. Heckathorn DD. Respondent-driven sampling: a new approach to the study of hidden populations. Soc Probl. 1997;44(2):174–99.
26. Allen DR, Finlayson T, Abdul-Quader A, Lansky A. The role of formative research in the National HIV Behavioral Surveillance System. Public Health Rep. 2009;124(1):26–33.
27. Centers for Disease Control. National HIV Behavioral Surveillance, Injection Drug Use – Round 5: Operations Manual. 2018.
28. Kessler RC, Barker PR, Colpe LJ, et al. Screening for serious mental illness in the general population. Arch Gen Psychiatry. 2003;60(2):184–9. [PubMed: 12578436]
29. Strathdee SA, Crago A-L, Butler J, Bekker L-G, Beyrer C. Dispelling myths about sex workers and HIV. Lancet. 2015;385(9962):4–7. [PubMed: 25059948]
30. Centers for Disease Control and Prevention. Addressing Social Determinants of Health: Accelerating the Prevention and Control of HIV/AIDS, Viral Hepatitis, STD and TB. External Consultation Meeting Report. 2009.
31. Kerrigan D, Karver TS, Barrington C, et al. Development of the experiences of sex work stigma scale using item response theory: implications for research on the social determinants of HIV. AIDS Behav. 2021;18:1–14.
32. Rusakova M, Rakhmetova A, Strathdee SA. Why are sex workers who use substances at risk for HIV? Lancet. 2014;385(9964):211–2. [PubMed: 25059944]

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

33. Geibel S, King'ola N, Temmerman M, Luchters S. The impact of peer outreach on HIV knowledge and prevention behaviours of male sex workers in Mombasa, Kenya. Sex Transm Infect. 2012;88(5):357–62. [PubMed: 22332149]
34. Lippman SA, Donini A, Díaz J, Chinaglia M, Reingold A, Kerrigan D. Social-environmental factors and protective sexual behavior among sex workers: the Encontros intervention in Brazil. Am J Public Health. 2010;100(S1):S216–23. [PubMed: 19762673]
35. Fauci AS, Redfield RR, Sigounas G, Weahkee MD, Giroir BP. Ending the HIV epidemic: a plan for the United States. J Am Med Assoc. 2019;321(9):844–5.
36. Mattick RP, Breen C, Kimber J, Davoli M. Buprenorphine maintenance versus placebo or methadone maintenance for opioid dependence. Cochrane Database Syst Rev. 2014;2:1.
37. Miller WC, Hoffman IF, Hanscom BS, et al. A scalable, integrated intervention to engage people who inject drugs in HIV care and medication-assisted treatment (HPTN 074): a randomised, controlled phase 3 feasibility and efficacy study. Lancet. 2018;392(10149):747–59. [PubMed: 30191830]
38. Owens DK, Davidson KW, Krist AH, et al. Preexposure prophylaxis for the prevention of HIV infection: US Preventive Services Task Force recommendation statement. J Am Med Assoc. 2019;321(22):2203–13.
39. Fernandes RM, Cary M, Duarte G, et al. Effectiveness of needle and syringe Programmes in people who inject drugs—an overview of systematic reviews. BMC Public Health. 2017;17(1):1–15. [PubMed: 28049454]
40. Aspinall EJ, Nambiar D, Goldberg DJ, et al. Are needle and syringe programmes associated with a reduction in HIV transmission among people who inject drugs: a systematic review and meta-analysis. Int J Epidemiol. 2014;43(1):235–48. [PubMed: 24374889]
41. Tookes H, Bartholomew TS, Geary S, et al. Rapid identification and investigation of an HIV risk network among people who inject drugs–Miami, FL, 2018. AIDS Behav. 2020;24(1):246–56. [PubMed: 31555932]
42. Gonsalves GS, Crawford FW. Dynamics of the HIV outbreak and response in Scott County, IN, USA, 2011–15: a modelling study. Lancet HIV. 2018;5(10):e569–77. [PubMed: 30220531]
43. Jarlais DCD, Nugent A, Solberg A, Feelemyer J, Mermin J, Holtzman D. Syringe service programs for persons who inject drugs in urban, suburban, and rural areas—United States, 2013. Morb Mortal Wkly Rep. 2015;64(48):1337–41.
44. Des Jarlais DC. Harm reduction in the USA: the research perspective and an archive to David Purchase. Harm Reduct J. 2017;14(1):1–7. [PubMed: 28056990]
45. U.S. Department of Health and Human Services. HIV National Strategic Plan for the United States: A Roadmap to End the Epidemic 2021–2025. Washington, DC; 2021.
46. Shannon K, Crago A-L, Baral SD, et al. The global response and unmet actions for HIV and sex workers. Lancet. 2018;392(10148):698–710. [PubMed: 30037733]
47. Kerrigan D, Mbwambo J, Likindikoki S, et al. Project Shikamana: community empowerment-based combination HIV prevention significantly impacts HIV incidence and care continuum outcomes among female sex workers in Iringa, Tanzania. J Acquir Immune Defic Syndr. 2019;82(2):141. [PubMed: 31513552]
48. Kerrigan D, Donastorg Y, Barrington C, et al. Assessing and addressing social determinants of HIV among female sex workers in the Dominican Republic and Tanzania through community empowerment-based responses. Curr HIV/AIDS Rep. 2020;17(2):88–96. [PubMed: 32072467]
49. Febres-Cordero B, Brouwer KC, Rocha-Jimenez T, Fernandez-Casanueva C, Morales-Miranda S, Goldenberg SM. Influence of peer support on HIV/STI prevention and safety amongst international migrant sex workers: a qualitative study at the Mexico–Guatemala border. PLoS ONE. 2018;13(1): e0190787. [PubMed: 29304164]
50. Rosenberg JS, Bakomeza D. Let's talk about sex work in humanitarian settings: piloting a rights-based approach to working with refugee women selling sex in Kampala. Reprod Health Matters. 2017;25(51):95–102. [PubMed: 29231800]
51. Wirtz AL, Peryshkina A, Mogilniy V, Beyrer C, Decker MR. Current and recent drug use intensifies sexual and structural HIV risk outcomes among female sex workers in the Russian Federation. Int J Drug Policy. 2015;26(8):755–63. [PubMed: 26003930]

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52. Dunne EM, Dyer TP, Khan MR, Cavanaugh CE, Melnikov A, Latimer WW. HIV prevalence and risk behaviors among African American women who trade sex for drugs versus economic resources. AIDS Behav. 2014;18(7):1288–92. [PubMed: 24496649]

53. Allen ST, White RH, O'Rourke A, et al. Syringe coverage among people who inject drugs in West Virginia, USA. AIDS Behav. 2021;25:1–9.

54. Ditmore MH. When sex work and drug use overlap: considerations for advocacy and practice. London: Harm Reduction International; 2013.

55. Decker MR, Crago A-L, Chu SK, et al. Human rights violations against sex workers: burden and effect on HIV. Lancet. 2015;385(9963):186–99. [PubMed: 25059943]

56. 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. Lancet HIV. 2017;4(3):e134–40. [PubMed: 28130026]

57. Goldenberg SM, Deering K, Amram O, et al. Community mapping of sex work criminalization and violence: impacts on HIV treatment interruptions among marginalized women living with HIV in Vancouver, Canada. Int J STD AIDS. 2017;28(10):1001–9. [PubMed: 28056726]

58. Amnesty International 2016; Webpage. https://www.amnesty.org/en/documents/pol30/4062/2016/en/. accessed Nov 1 2021.

59. ProCon.org 2018; Webpage. https://prostitution.procon.org/us-federal-and-state-prostitution-laws-and-related-punishments/. accessed Oct 29 2021.

60. Platt L, Grenfell P, Meiksin R, et al. Associations between sex work laws and sex workers' health: a systematic review and meta-analysis of quantitative and qualitative studies. PLoS Med. 2018;15(12): e1002680. [PubMed: 30532209]

61. Socías M, Deering K, Horton M, Nguyen P, Montaner J, Shannon K. Social and structural factors shaping high rates of incarceration among sex workers in a Canadian setting. J Urban Health. 2015;92(5):966–79. [PubMed: 26260991]

62. Wurth MH, Schleifer R, McLemore M, Todrys KW, Amon JJ. Condoms as evidence of prostitution in the United States and the criminalization of sex work. J Int AIDS Soc. 2013;16:1. [PubMed: 24008177]

63. Blunt D, Wolf A. Erased: the impact of FOSTA-SESTA and the removal of Backpage on sex workers. Anti-trafficking Rev. 2020;14:117–21.

64. Sherman SG, Nestadt DF, Silberzahn BE, Decker M, Park JN, Footer KH. The role of STIs in police as clients among street-based female sex workers in Baltimore City. Sex Transm Dis. 2020;48:12.

65. Dowling-Guyer S, Johnson ME, Fisher DG, et al. Reliability of drug users' self-reported HIV risk behaviors and validity of self-reported recent drug use. Assessment. 1994;1(4):383–92.

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Table 1

Prevalence of exchange sex in previous 12 months among persons who inject drugs, stratified by sex, National HIV Behavioral Surveillance, 2018

	Women					**MSM**				
	Total[a]	**Exchanged sex**[b]				**Total**[a]	**Exchanged sex**[b]			
		n	**%**	**Chi-Square**[c]	**p**[c]		**n**	**%**	**Chi-Square**[c]	**p**[c]
Age (years)				**16.19**	**0.003**				**17.80**	**0.001**
18–24	162	50	30.9			47	20	42.6		
25–29	404	155	38.4			149	57	38.3		
30–39	995	387	38.9			334	135	40.4		
40–49	809	329	40.7			323	108	33.4		
≥ 50	1021	306	30.0			413	121	29.3		
Race/ethnicity				6.43	0.092				**10.47**	**0.015**
Black	968	401	41.4			358	151	42.2		
Hispanic/Latino	561	211	37.6			311	112	36.0		
White	1564	508	32.5			479	142	29.7		
Other, including multiple races	296	106	35.8			117	36	30.8		
Education				**26.63**	**< 0.001**				0.76	0.683
< High school	996	422	42.4			327	122	37.3		
High school diploma or equivalent	1244	451	36.3			508	181	35.6		
Some college/technical/postgraduate	1150	353	30.7			430	138	32.1		
Employment				**11.45**	**< 0.001**				1.31	0.253
Full/part time	421	123	29.2			167	52	31.1		
Not working	2970	1104	37.2			1099	389	35.4		
At or below poverty				0.54	0.461				0.69	0.408
Yes	2630	963	36.6			949	339	35.7		
No	734	255	34.7			314	100	31.9		
Health insurance				**17.65**	**< 0.001**				**5.80**	**0.0160**
Yes	2606	867	33.3			905	286	31.6		
No	775	354	45.7			358	155	43.3		
Homeless (previous 12 months)				**107.29**	**< 0.001**				**24.14**	**< 0.001**
Yes	2250	940	41.8			998	395	39.6		

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	Women					MSM				
	Total[a]	Exchanged sex[b]				Total[a]	Exchanged sex[b]			
		n	%	Chi-Square[c]	p[c]		n	%	Chi-Square[c]	p[c]
No	1140	287	25.2			268	46	17.2		
Incarcerated (previous 12 months)				**46.65**	**< 0.001**				1.49	0.222
Yes	1024	435	42.5			525	198	37.7		
No	2366	791	33.4			741	243	32.8		
Mental health				**70.37**	**< 0.001**				**35.28**	**< 0.001**
Kessler six (K6)—score ≥ 13[d]	1417	632	44.6			516	221	42.8		
Kessler six (K6)—score < 13	1967	593	30.2			746	219	29.4		

[a] Totals are not equal across variables due to missingness

[b] Exchange sex refers to *receiving* money/drugs from one or more *men* in exchange for sex during the previous 12 months. Individuals who only gave money/drugs, but never received money/drugs, in exchange for sex from other men did not meet criteria for this definition. All men in the study population reported having sex with another man during their lifetimes

[c] Chi-square test statistics and associated p-values are based on Wald statistics for Type 3 Generalized Estimating Equations; test statistics with p-values of < 0.05 are shown in bold

[d] Mental illness severity was assessed using the Kessler six (K6) questionnaire; a score ≥ 13 is a positive screen for probable serious psychological distress

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Table 2

Distribution of sexual factors, drug use factors, and use of services by exchange sex status among persons who inject drugs, stratified by sex, National HIV Behavioral Surveillance, 2018

	Women								MSM							
	Total[a]		Exchange sex[b]		No exchange sex		Chi-square[c]	p[c]	Total[a]		Exchange sex[b]		No exchange sex		Chi-square[c]	p[c]
	n	%	n	%	n	%			n	%	n	%	n	%		
Sexual factors																
Condomless sex, previous 12 months[d]							0.02	0.891							0.71	0.401
Yes	2589	90.1	1099	89.7	1490	90.4			957	85.6	380	86.6	577	85.0		
No	285	9.9	126	10.3	159	9.6			161	14.4	59	13.4	102	15.0		
Number of condomless anal sex partners, previous 12 months[d]							**298.18**	**< 0.001**							**165.21**	**< 0.001**
None	1941	67.6	747	61.1	1194	72.5			411	36.9	108	24.8	303	44.6		
1 partner	614	21.4	231	19.0	383	23.2			279	25.0	72	16.5	207	30.5		
2 partners	160	5.6	110	9.0	50	3.0			114	10.2	57	13.1	57	8.4		
3 partners	53	1.8	43	3.5	10	0.6			66	5.9	37	8.5	29	4.3		
≥ 4 partners	103	3.6	92	7.5	11	0.7			245	22.0	162	37.2	83	12.2		
Last sex partner HIV status[d]							**198.54**	**< 0.001**							**21.33**	**< 0.001**
Negative	1568	54.7	496	40.7	1072	65.1			420	37.7	124	28.4	296	43.7		
Positive	49	1.7	24	2.0	25	1.5			89	8.0	36	8.3	53	7.8		
Status Unknown	1249	43.6	698	57.3	551	33.4			604	54.3	276	63.3	328	48.5		
Last partner ever injected drugs[d,e]							**77.55**	**< 0.001**							1.82	0.178
Yes	1877	66.2	654	54.6	1223	74.7			765	69.5	311	72.0	454	67.9		
No	960	33.8	545	45.5	415	25.3			336	30.5	121	28.0	215	32.1		
Sexually transmitted infection diagnosis, previous 12 months							**90.35**	**< 0.001**							**17.96**	**< 0.001**
Yes	274	8.1	164	13.4	110	5.1			103	8.4	54	12.7	49	6.1		
No	3104	91.9	1057	86.6	2047	94.9			1129	91.6	371	87.3	758	93.9		
Drug use factors																
Years since first injection							3.00	0.223							**6.99**	**0.030**
0–3	500	14.8	160	13.1	340	15.8			121	9.6	41	9.4	80	9.8		

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	Women								MSM							
	Total[a]		Exchange sex[b]		No exchange sex		Chi-square[c]	p[c]	Total[a]		Exchange sex[b]		No exchange sex		Chi-square[c]	p[c]
	n	%	n	%	n	%			n	%	n	%	n	%		
4–6	410	12.2	151	12.4	259	12.1			108	8.6	46	10.5	62	7.6		
≥ 7	2460	73.0	909	74.5	1551	72.1			1026	81.8	351	80.1	675	82.6		
Injection frequency							**12.30**	**0.006**							6.14	0.105
More than once a day	2734	80.9	1031	84.2	1703	79.0			909	71.9	330	75.0	579	70.3		
Once a day	260	7.7	77	6.3	183	8.5			141	11.2	38	8.6	103	12.5		
More than once a week	243	7.2	84	6.9	159	7.4			146	11.6	54	12.3	92	11.2		
Once a week or less	144	4.3	33	2.7	111	5.2			68	5.4	18	4.1	50	6.1		
Receptive syringe sharing, previous 12 months							**67.41**	**< 0.001**							**14.16**	**< 0.001**
Yes	1217	35.9	539	44.0	678	31.3			566	44.7	235	53.3	331	40.1		
No	2172	64.1	686	56.0	1486	68.7			700	55.3	206	46.7	494	59.9		
Distributive syringe sharing, previous 12 months							**62.88**	**< 0.001**							**15.04**	**< 0.001**
Yes	1583	46.7	675	55.1	908	42.0			650	51.3	260	59.0	390	47.3		
No	1806	53.3	550	44.9	1256	58.0			616	48.7	181	41.0	435	52.7		
Drug injected most frequently							**35.19**	**< 0.001**							**38.81**	**< 0.001**
Heroin	1975	58.5	690	56.4	1285	59.6			498	39.4	127	28.9	371	45.0		
Cocaine	39	1.2	11	0.9	28	1.3			30	2.4	14	3.2	16	1.9		
Speedball (Heroin and cocaine)	170	5.0	59	4.8	111	5.2			104	8.2	41	9.3	63	7.7		
Heroin, speedball, or cocaine	417	12.3	187	15.3	230	10.7			152	12.0	64	14.6	88	10.7		
Crack	9	0.3	3	0.3	6	0.3			3	0.2	2	0.5	1	0.1		
Methamphetamine	221	6.5	38	3.1	183	8.5			184	14.6	67	15.3	117	14.2		
Oxycontin or painkillers	22	0.7	6	0.5	16	0.7			8	0.6	3	0.7	5	0.6		
Multiple	525	15.5	229	18.7	296	13.7			284	22.5	121	27.6	163	19.8		
Noninjection crack cocaine use, previous 12 months							**107.03**	**< 0.001**							2.40	0.121
Yes	1679	49.5	810	66.0	869	40.2			671	53.0	251	56.9	420	50.9		
No	1712	50.5	417	34.0	1295	59.8			595	47.0	190	43.1	405	49.1		
Noninjection meth use, previous 12 months							**7.92**	**0.005**							3.54	0.060
Yes	1188	35.1	384	31.3	804	37.2			641	50.7	229	51.9	412	50.0		

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	Women								MSM							
	Total[a]		Exchange sex[b]		No exchange sex		Chi-square[c]	p[c]	Total[a]		Exchange sex[b]		No exchange sex		Chi-square[c]	p[c]
	n	%	n	%	n	%			n	%	n	%	n	%		
No	2201	64.9	842	68.7	1359	62.8			624	49.3	212	48.1	412	50.0		
Binge drinking, previous 30 days							**63.41**	**< 0.001**							**21.50**	**< 0.001**
Yes	906	26.8	443	36.3	463	21.5			407	32.4	185	42.2	222	27.1		
No	2472	73.2	778	63.7	1694	78.5			851	67.6	253	57.8	598	72.9		
Nonfatal overdose within the past 12 mo[f]							**46.99**	**< 0.001**							3.01	0.083
Yes	950	29.1	439	36.4	511	24.8			394	34.1	151	37.8	243	32.2		
No	2316	70.9	766	63.6	1550	75.2			760	65.9	248	62.2	512	67.8		
HIV Status, Testing, and Health Services																
Tested for HIV, previous 12 months							**7.80**	**0.020**							3.54	0.171
Not tested past year (and not HIV+)	1407	42.0	452	37.1	955	44.8			468	37.4	176	40.3	292	35.8		
Tested past year (includes HIV+ diagnosis in past year)	1812	54.1	704	57.9	1108	52.0			648	51.8	207	47.4	441	54.1		
Not tested past year because HIV+ diagnosis over a year ago	130	3.9	61	5.0	69	3.2			136	10.9	54	12.4	82	10.1		
HIV status (NHBS test result)							**7.91**	**0.005**							1.79	0.181
Negative	3189	94.0	1129	92.0	2060	95.2			1069	84.4	364	82.5	705	85.5		
Positive	202	6.0	98	8.0	104	4.8			197	15.6	77	17.5	120	14.6		
Taken MOUD, previous 12 months[f]							0.26	0.608							2.42	0.120
Yes	1843	54.3	669	54.5	1174	54.3			562	44.5	177	40.3	385	46.7		
No	1548	45.7	558	45.5	990	45.8			702	55.5	262	59.7	440	53.3		
Visited any health care provider, previous 12 months							0.02	0.899							3.33	0.068
Yes	2806	82.8	1010	82.3	1796	83.1			1022	80.1	340	77.1	682	82.7		
No	582	17.2	217	17.7	365	16.9			244	19.3	101	22.9	143	17.3		
Received HIV intervention (ind. or group), previous 12 months							2.49	0.114							0.09	0.761
Yes	1139	33.6	446	36.4	693	32.0			415	32.8	143	32.4	272	33.0		
No	2251	66.4	780	63.6	1471	68.0			850	67.2	298	67.6	552	67.0		

[a] Totals are not equal across variables due to missingness

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[b] Exchange sex refers to *receiving* money/drugs from one or more *men* in exchange for sex during the previous 12 months. Individuals who only gave money/drugs, but never received money/drugs, in exchange for sex from other men did not meet criteria for this definition. All men in the study population reported having sex with another man during their lifetimes

[c] Chi-square test statistics and associated p-values are based on Wald statistics for Type 3 Generalized Estimating Equations; test statistics with p-values of < 0.05 are shown in bold

[d] Total excludes individuals who reported having zero sexual partners in the previous 12 months

[e] The category "Yes" includes individuals who reported that their partners "definitely" or "probably" injected drugs; The category "No" includes individuals who reported that their partners "definitely" or "probably" had *not* injected drugs

[f] Excludes individuals who reported not using opioids in the previous 12 months (MOUD refers to medications for opioid use disorder)

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