HHS Public Access

Author manuscript

J Drug Issues. Author manuscript; available in PMC 2018 July 01.

Published in final edited form as:

J Drug Issues. 2017 July ; 47(3): 383–395. doi:10.1177/0022042617696917.

Associations between Methamphetamine Use, Housing Status, and Incarceration Rates among Men Who Have Sex with Men and Transgender Women

Kaston D. Anderson-Carpenter,
University of California, Los Angeles, Michigan State University

Jesse B. Fletcher, and
Friends Research Institute, Inc.

Cathy J. Reback
University of California, Los Angeles, Friends Research Institute, Inc.

Abstract

The present study examined associations between methamphetamine use and social factors among men who have sex with men (MSM) and transgender women. Over a four-year period, 7,419 HIV outreach encounters were conducted with MSM (n=6,243) and transgender women (n=1,176). Logistic and negative binomial regressions estimated associations between sociodemographics, incarceration history, housing status, and methamphetamine use. Incarceration history was associated with marginal housing or homelessness (AOR=3.4) and with increased likelihood (AOR = 6.00) and rate (AIRR = 3.57) of methamphetamine use. African American/Black MSM and transgender women were more likely to report a recent incarceration history compared to non-African American/Black participants (AOR=2.18). Incarceration history was associated with a HIV-positive status (AOR=1.69), and transgender women were 5.2 times more likely to report recent incarceration relative to MSM. Understanding these associations may provide a basis for developing interventions that account for the social factors influencing health outcomes among these high-risk populations.

Keywords

methamphetamine; men who have sex with men; transgender; men who have sex with men; HIV; incarceration; housing

---

Men who have sex with men (MSM) and transgender women (hereafter trans women) experience multiple social challenges that place them at a disproportionate risk of incarceration (i.e., jail or prison) compared to other populations. Recent estimates from the U.S. Justice Department indicate that about 1 out of every 110 adults in the United States is currently incarcerated (Glaze & Kaeble, 2014). Although incarceration rates for MSM and trans women are not readily available, it has been suggested that these two populations

Corresponding author: Kaston Anderson-Carpenter, Department of Psychology, Michigan State University, 316 Physics Rd. Room 125C, East Lansing, MI 48824. Phone: (517) 432-0686. kaston@msu.edu.

experience a greater risk of incarceration (Garofalo, Deleon, Osmer, Doll, & Harper, 2006; Lim, Sullivan, Salazar, Spaulding, & Dinenno, 2011; Milloy, Kerr, Buxton, Montaner, & Wood, 2009; Reisner, Bailey, & Sevelius, 2014; Taylor, Aynalem, Smith, Montoya, & Kerndt, 2007).

For African American/Black MSM and trans women, incarceration rates are higher than their Caucasian/White counterparts, and African American/Black trans women experience a significantly higher risk of incarceration than African American/Black MSM (Brewer et al., 2014). Similar to other populations, racial/ethnic differences exist in incarceration rates among trans women; African American/Black trans women are more likely to have reported a history of incarceration compared to Caucasian/White trans women (Reisner et al., 2014). Furthermore, prior evidence suggests that MSM and trans women with a history of incarceration are more likely to self-report a HIV-positive serostatus (Reisner et al., 2014), and the association is even higher for African American/Black MSM compared to their non-African American/Black counterparts (Millett et al., 2012).

Incarceration rates among trans women are increased due to high rates of engagement in sex work (Brennan et al., 2012; Garofalo et al., 2006). In addition to elevated incarceration rates, MSM and trans women also experience a greater risk of housing instability (i.e., marginal housing or homelessness) compared to the general population. Trans women are at an especially greater risk of having unstable housing due to pervasive stigma and discrimination. Furthermore, housing instability and living in public has been associated with an elevated risk of acquiring HIV (Fletcher, Kisler, & Reback, 2014). In a recent study conducted in Los Angeles County, California, MSM and trans women who experienced marginal housing showed substantial risks for HIV acquisition (Fletcher et al., 2014), and a recent systematic review found that unstable housing is associated with higher rates of HIV risk behavior among MSM (Aidala et al., 2016). Although literature on MSM and trans women's health has been based predominantly on samples from urban settings, results consistently demonstrate that MSM and trans women experience disproportionately worse public health outcomes associated with social factors such as incarceration and housing instability, and such associations are expected to hold in rural areas.

The association between incarceration and methamphetamine use among MSM and trans women has been well documented (Milloy et al., 2009; Reisner et al., 2014; Taylor et al., 2007). MSM who use methamphetamine are five times more likely of being incarcerated in the past 12 months compared to non-methamphetamine using MSM (Taylor et al., 2007). Research in California has found that between 23–27% of substance-using MSM have reported methamphetamine use in the past 30 days, and approximately 20% of trans women have used methamphetamine in the past year (Reback, Fletcher, Shoptaw, & Grella, 2013; Santos et al., 2014). Moreover, methamphetamine use remains the third most frequently used substance among MSM and trans women after alcohol and marijuana (Arreola et al., 2015; Reback & Fletcher, 2014) and has been linked to deleterious public health outcomes (Forrest et al., 2010; Freeman et al., 2011; Shoptaw & Reback, 2006).

Such disparities may be explained by an intersectionality framework. This framework describes behavioral, psychological, and public health outcomes as influenced by multiple

social identities that interact at various ecological levels simultaneously (Cole, 2009). Specifically, the intersectionality framework recognizes that multiple interlocking factors associated with a lack of sociocultural power and privilege may contribute to disparate health outcomes (Cole, 2009; Earnshaw, Smith, Cunningham, & Copenhaver, 2015). In the context of MSM and trans women health, factors such as having a sexual or gender minority status, identifying as a racial/ethnic minority, and having unstable or inadequate housing may interact to aggravate disparities in HIV serostatus and substance use.

Despite the literature on the associations between HIV status, methamphetamine use, and incarceration risk, the relationships between social cofactors and these public health outcomes among MSM and trans women are not well understood. Moreover, to our knowledge, no studies have examined the direct association between incarceration history and methamphetamine use among trans women. Using a large urban sample of MSM and trans women, the present study examines the following hypotheses: (1) incarceration history is associated with methamphetamine use among MSM and trans women, (2) incarceration risks are greater among trans women compared to MSM, and (3) incarceration history and trans woman identity are associated with greater risk of homelessness.

Method

Participants

Participants (N = 7,419) were self-identified MSM (n = 6,243) and trans women (n = 1,176) contacted via HIV prevention outreach encounters on the streets and high-risk venues of the Hollywood, West Hollywood, and Downtown areas of Los Angeles County (LAC), or when the participant came to the community research site in Hollywood seeking services. All potential participants were eligible for participation if they self-identified as either a MSM or a trans woman. A trans woman was defined as any person who believed her male biological sex assigned at birth was in conflict with her female gender identity, regardless of her stage of gender transition.

Procedure

Data were collected from January 2010 through December 2014. HIV prevention outreach encounters were conducted by teams of two-to-three ethnically diverse, bilingual (English and Spanish) outreach workers. The outreach teams canvassed areas known to be frequented by the target populations including bars, clubs, parks, street corners, cruising boulevards, inexpensive hotels, bathhouses and sex clubs (MSM only), and hair and nail shops (trans women only). Outreach was conducted Mondays through Saturdays during rotating hours between 11:00 AM and 1:00 AM. Prior to conducting outreach activities, all staff received a six to eight-week training that includes observing senior staff in the field and didactic trainings on how to: establish trust and rapport, approach potential participants in a high-risk setting, administer the outreach encounter assessment, protect privacy and confidentiality, and provide culturally appropriate referrals. All staff were required to pass an outreach proficiency training.

Outreach workers recorded participant's responses on a brief encounter instrument that assessed for demographics (gender identification, age, race/ethnicity, sexual identification), HIV status, substance use in past 30 days (including injection drug use), and incarceration history in the past 12 months. All data were self-reported. The HIV prevention outreach encounter lasted from 16 to 60 minutes. Participants were not compensated for their participation. All program materials were approved by the LAC Department of Public Health, Division of HIV STD Programs.

Statistical Analysis

Assessments were completed manually and then scanned into an electronic database and sorted by date. Duplicate identifiers were removed, leaving only the first unique identifier (i.e., encounter) for analysis. A total of 9,172 initial assessments were completed (MSM: 6,784; trans women: 2,388). Nineteen percent of initial assessments were duplicated identifiers and one identifier was missing a sexual identity variable, these were all eliminated. Thus, the final sample for analysis consisted of 7,419 unique identifiers.

Race/ethnicity was dichotomously categorized as African American/Black or non-African American/Black. Participants identified their sexual identity as heterosexual, gay, lesbian, or bisexual. Gender identity was categorized as male or trans woman (i.e., male-to-female pre- or post-gender confirmation surgery). Housing status was categorized as housed (e.g., owning or renting an apartment, condo, or house), marginally housed (e.g., living in a shelter, living on a friend's couch), or homeless (e.g., living on the streets). Moreover, participants were asked if they had been incarcerated (i.e., detained in a jail or prison for any period of time) at any point in the past 12 months. Incarceration was dummy coded and treated categorically. Participants were asked their current HIV status (i.e., HIV positive, HIV negative, unknown HIV status, or declined/refused to respond). Days of methamphetamine and injection use were treated and analyzed as count variables. To assess recent methamphetamine use, participants were asked how many days they used methamphetamine in the past 30 days.

Logistic regression analyses were used to explore associations between sociodemographic variables, housing status, and recent incarceration history/methamphetamine use. Negative binomial regression was used to examine the estimated association between sociodemographics/recent incarceration history with past 30-day methamphetamine use. Negative binomial models were selected over Poisson models due to a significant likelihood ratio test of alpha, indicating a better fit to the negative binomial model (χ^{-2}=3.4e+04;$p \leq 0.001$). In addition to assessing the rate of methamphetamine use in the past 30 days, a logistic model was carried out to discriminate between factors that promote initiation/use, as well as the factors that promote increased usage rates. All multivariate models report coefficients in their exponentiated forms (i.e., adjusted odds ratios for logistic regressions, adjusted relative risk ratios for multinomial logistic regressions, and adjusted incidence rate ratios for negative binomial regressions). All analyses were conducted with Stata SE version 14 (StataCorp, College Station, TX; 2015). Significance was flagged beginning at alpha < .05.

Results

Sociodemographic Characteristics

Table 1 presents descriptive statistics on sociodemographic variables, housing status, recent incarceration, and past 30-day methamphetamine use for MSM and trans women. The participants ranged in age from 13 to 87 years ($M = 33.8$, $SD = 9.8$). More than half of the participants (52%) were between 26 and 39 years old, with more participants aged from 31 to 39 (31%) than any other age category. MSM were older than trans women (mean 34.1 years versus 31.9 years; $\chi^2_{(7,415)} = 6.91$, $p \leq .001$). The sample consisted of more non-African American/Black participants relative to African American/Black participants; approximately 45% of the MSM were Caucasian/White, followed by Hispanic/Latino (30%). Among trans women, 60% of the participants were Hispanic/Latina and 10% were Caucasian/White. Although 78% of MSM were housed, just more than 60% of trans women had adequate housing. Moreover, a greater percentage of trans women in the sample reported homelessness relative to MSM (26% versus 12%, respectively). Significant differences were also observed in incarceration history and methamphetamine use, with a greater percentage of trans women reporting being incarcerated in the past 12 months and using methamphetamine in the past 30 days relative to MSM (both $p \leq .001$).

Methamphetamine Use, Recent Incarceration, and HIV Status

Table 2 demonstrates that as a main effect, recent incarceration was significantly associated with an increased likelihood (AOR = 6.00) and rate (AIRR = 3.57) of methamphetamine use in the sample. The main effect for increased likelihood was tempered, however, by a significant moderating effect of participant gender identity (AOR = 0.62). Post-estimation examination of predicted outcome probabilities indicate that incarceration significantly increases the likelihood of methamphetamine use for both populations, but the increase in likelihood is of a significantly greater magnitude among MSM than among trans women. Multivariable analyses also indicated that HIV status was associated with increased likelihood (AOR = 2.76) and rate (AIRR = 2.08) of recent methamphetamine use in the sample. Racial/ethnic identity and participant gender identity had no direct effects on methamphetamine use in this sample.

Race/ethnicity, HIV Status, and Recent Incarceration

Logistic regression model was used to test whether racial/ethnic minority status and HIV serostatus were associated with incarceration risk in the past 12 months (Table 3). Holding other variables in the model constant, the logistic regression model showed that African American/Black participants were more likely to have reported a recent episode of incarceration compared to non-African American/Black participants, AOR = 2.18, $p \leq .001$, 95% CI: (1.77, 2.69). Furthermore, having a HIV-positive serostatus was associated with an increased risk of recent incarceration compared to a non-positive or unknown status, AOR = 1.69, $p \leq .001$, 95% CI: (1.31, 2.16). Trans women were more than five times more likely to have been incarcerated in the past 12 months compared to MSM, AOR = 5.20, $p \leq .001$, 95% CI: (3.74, 7.24). Furthermore, there was a significant interaction between identifying as a trans woman and being 26 or older, with older trans women demonstrating significantly

lower odds of reporting recent incarceration relative to younger trans women, AOR = 0.56, p = .002, 95% CI: (0.39, 0.81).

A further analysis of incarceration probabilities using the delta method revealed differences in past 12-month incarceration history by race/ethnicity, HIV status, and gender identity. More specifically, 14% of African American/Black MSM were incarcerated in the past 12 months compared to their Caucasian/White counterparts ($\hat{p}$ = 7%). Among trans women, recent incarceration probabilities also showed racial/ethnic disparity. Whereas 21% of non-African American/Black trans women reported a past 12-month incarceration, 45% of African American/Black trans women reported the same.

Comparing probabilities for MSM and trans women showed that the percentage of African American/Black trans women participants who reported a recent incarceration was substantially greater than those for African American/Black MSM ($\hat{p}$ = 45% versus 14%, respectively). Among participants who did not report a positive HIV serostatus, African American/Black trans women reported the highest probability of being incarcerated in the past 12 months across race/ethnicity and gender identity demographics.

The results also showed that participants who reported a positive HIV serostatus were more likely to have reported a recent incarceration compared to those participants who did not report a HIV positive serostatus. African American/Black MSM reported a high probability of being incarcerated in the past 12 months, and those who also reported a positive HIV serostatus were at an even greater risk of being incarcerated ($\hat{p}$ = 22%) compared to their counterparts who did not report a positive HIV status ($\hat{p}$ = 14%). Similar results were found among trans women. Particularly, non-African American/Black, HIV-positive trans women showed a greater probability of having a recent incarceration ($\hat{p}$ = 32%) compared to non-African American/Black trans women who did not report a HIV-positive status ($\hat{p}$ = 21%).

Race/ethnicity, Housing Status, and Incarceration

A multinomial logistic regression model was used to test whether sociodemographic factors and recent incarceration history were associated with current housing status (Table 4). Compared to participants who rented or owned a residence, MSM and trans women who were recently incarcerated experienced a 3.4 times greater relative risk of having been marginally housed (95% CI: 2.59 - 4.47). Additionally, race/ethnicity, HIV status, and age were all significantly associated with being marginally housed (all ps ≤ .001), although older participants (i.e., older than 25) were significantly less likely to be marginally housed or homeless, and significantly more likely to be housed, relative to younger participants (both p < .001). Finally, coefficients describing the interaction between gender identity and recent incarceration were both significant and negative, though the observed magnitudes of these effects were in both cases less than the combined main effects of each factor, and therefore simply describe a mitigation of such combined effects.

MSM and trans women who reported being incarcerated in the past 12 months showed significantly greater odds of being homeless compared to participants with no such incarceration history (ARRR = 13.76, 95% CI: 11.17 – 16.94). Furthermore, trans women,

African American/Black participants, and HIV-positive participants each showed greater relative risks for homelessness (ARRRs: 2.99, 3.29, and 2.36 respectively, all *p*s ≤ .01).

MSM and trans women who were incarcerated in the past 12 months had a greater likelihood of being marginally housed or homeless. More specifically, 15% of recently incarcerated MSM and 13% of trans women reported having marginal housing compared to 9% each for MSM and trans women with no such history. With respect to homelessness, the probabilities increase substantially: 48% of recently incarcerated MSM and 32% of recently incarcerated trans women reported being homeless compared to 8% of MSM and 20% of trans women with no recent incarceration history.

Discussion

The present study examined associations between social cofactors and outcomes for incarceration, housing status, and methamphetamine use among 7,419 MSM and trans women. The results presented in the present study indicated that several variables influence the probability and rate of methamphetamine use among MSM and trans women. A summary of the incarceration risk profile shows that young, African American/Black, HIV-positive trans women had the greatest probability of past 12-month incarceration (Table 5). Studies have consistently demonstrated that incarceration history has been shown to increase the risk of methamphetamine use (Milloy et al., 2009; Reisner et al., 2014; Taylor et al., 2007; Thomson et al., 2009). From the present study's results, it is not known whether incarceration precipitates methamphetamine use or whether incarceration is a result of being arrested while under the influence of methamphetamine use. Thus, more research in the causal relationship between incarceration and methamphetamine use is warranted. Moreover, future research should consider the type of correctional facility (i.e., jail versus prison) in understanding this relationship, as prisons are more likely to provide substance abuse treatment programs to incarcerated individuals. Rehabilitation and treatment programs vary widely across correctional facilities and the impact of such programs may differ for MSM and trans women.

The results also demonstrated that trans women experienced greater odds of being incarcerated in the past 12 months compared to MSM. Significant associations were also observed independently for African American/Black and HIV-positive participants. Researchers have previously noted multiple factors that contribute to the increased risk of incarceration among MSM and trans women (Brewer et al., 2014; Reisner et al., 2014). These differences may be due to several factors. Some MSM and trans women engage in exchange sex (i.e., sex in exchange for drugs, money, or needed goods), which is criminalized in most United States jurisdictions. Additionally, trans women may inject non-prescribed hormones which can then increase their odds of being arrested and incarcerated for possession of drug paraphernalia. Furthermore, because trans women are often restricted from educational attainment or lawful employment based on their gender identity, and removed from families who provide financial and other support, many trans women are arrested for vagrancy.

Although African American/Black participants and HIV-positive participants independently reported greater odds for incarceration, HIV-positive African American/Black participants did not show greater odds for incarceration in the past 12 months. These results are consistent with previous findings (Maulsby et al., 2014; Millett, Peterson, Wolitski, & Stall, 2006), wherein African American/Black MSM were more likely to report a history of incarceration but the association between HIV-positive status and incarceration was lacking in African American/Black MSM. Differences in incarceration odds between MSM and trans women in the present study were also consistent with past research. In a recent study, African American/Black trans women experienced a greater odds of incarceration compared to African American/Black MSM (80% versus 60%, respectively) (Brewer et al., 2014). The present study found that African American/Black trans women experienced even more disparate risks, regardless of HIV serostatus. These findings demonstrated that African American/Black trans women are a highly vulnerable group and are most at risk for involvement with the criminal justice system. Although there is much work to be done in understanding fully the associations between race/ethnicity and incarceration risk for MSM and trans adults, future research should explore evidence-based interventions that target determinants of incarceration for these two populations.

Recent incarceration was also significantly associated with being marginally housed or homeless for MSM and trans women, and trans women experienced a greater relative risk of being homeless compared to MSM. Being African American/Black or HIV positive was also independently associated with greater odds of unstable housing (i.e., marginal housing and homelessness). These findings may be due to many MSM and trans women being rejected from their families or evicted from their place of residence based on discrimination. As a result, many MSM and trans women may turn to exchange sex or other illegal activity to procure needed items for survival. Together, these factors may increase the likelihood of unstably housed MSM and trans women being arrested by police and subsequently incarcerated.

The sample size used for this study (N = 7,419) was exceptionally large compared to other research concerning incarceration risks among MSM and trans women, which allowed for greater sub-group analyses. Past research examining relationships between incarceration history, housing, and methamphetamine use among MSM have used samples less than 500 (Ghanem et al., 2011; Halkitis et al., 2009; Patterson, Semple, Zians, & Strathdee, 2005; Semple, Patterson, & Grant, 2004), with some more recent research using larger samples (Lim et al., 2011; Reback et al., 2013). Recent studies examining similar outcomes with trans women often reported sample sizes of less than 1,000 participants (Bradford, Reisner, Honnold, & Xavier, 2013; Fletcher et al., 2014; Wilson et al., 2015), although one study examining associations between substance use, HIV prevalence, and sexual risk behaviors reported a sample of 2,136 trans women (Reback & Fletcher, 2014).

Limitations and Conclusions

The results presented here should be interpreted in light of the study limitations. The cross-sectional design employed does not necessarily allow for causes of methamphetamine use, housing status, or incarceration to be concluded from the results. Nevertheless, the use of

cross-sectional data can be used to infer certain types of causality, particularly if the parameter of time is inherent in the data set. (For a discussion on causality using cross-sectional data, see Wunsch, Russo, & Mouchart, 2010). In addition, given the observational nature of the study, there was potential reporting bias and recall errors from self-reported measures. Particularly, the results may represent a more conservative count of methamphetamine use, HIV-positive status (or a HIV positive participant who was, at the time of the encounter, unaware of his or her HIV status), and recent incarceration than expected due social desirability bias and stigma (Quinn & Chaudoir, 2009). Additionally, given that participants were recruited from high-risk settings, or were seeking HIV prevention services at a community research site, the sample of MSM and trans women may not be representative of all MSM and trans women within LAC. Furthermore, the results may not be representative of MSM and trans women methamphetamine users in other geographic areas, such as rural communities. From a methodological perspective, the nature of these data does not allow causality to be inferred. Thus, the purpose was to estimate associations between demographic and social predictors, and methamphetamine use in the past 30 days.

Limitations notwithstanding, this study delineates the associations of methamphetamine use, housing status, and recent incarceration among MSM and trans women. Although prior literature has described methamphetamine use trends for MSM (Reback & Fletcher, 2014; Reback, Shoptaw, & Grella, 2008) and trans women (Herbst et al., 2008; Santos et al., 2014), no study has investigated the relationships between recent methamphetamine use, housing status, and incarceration history specifically for these two high-risk populations. Gaining a fuller understanding of the associations between these cofactors may provide a basis for developing more tailored interventions that account for the social factors of these two priority groups.

Acknowledgments

This study was supported by the Los Angeles County, Department of Public Health, Division of HIV and STD Programs (formerly Office of AIDS Programs and Policy) contracts #H700861 and PH#001039. Dr. Anderson-Carpenter acknowledges additional support from the National Institute on Drug Abuse (5T32DA007272-23) and Dr. Reback acknowledges additional support from the National Institute of Mental Health (P30 MH58107). The authors thank the outreach workers who conducted the field work and assessments for their dedication to serving their communities.

References

Aidala AA, Wilson mg, Shubert V, Gogolishvili D, Globerman J, Rueda S, Rourke SB. Housing status, medical care, and health outcomes among people living with HIV/AIDS: A systematic review. American Journal of Public Health. 2016; 106(1):e1–e23. DOI: 10.2105/AJPH.2015.302905

Arreola S, Santos GM, Beck J, Sundararaj M, Wilson PA, Hebert P, Ayala G. Sexual stigma, criminalization, investment, and access to HIV services among men who have sex with men worldwide. AIDS and Behavior. 2015; 19(2):227–234. DOI: 10.1007/s10461-014-0869-x [PubMed: 25086670]

Bradford J, Reisner SL, Honnold JA, Xavier J. Experiences of transgender-related discrimination and implications for health: results from the Virginia Transgender Health Initiative Study. American Journal of Public Health. 2013; 103(10):1820–1829. DOI: 10.2105/AJPH.2012.300796 [PubMed: 23153142]

Brennan J, Kuhns LM, Johnson AK, Belzer M, Wilson EC, Garofalo R, Adolescent Medicine Trials Network for HIV/AIDS Interventions. Syndemic theory and HIV-related risk among young transgender women: the role of multiple, co-occurring health problems and social marginalization. American Journal of Public Health. 2012; 102(9):1751–1757. DOI: 10.2105/AJPH.2011.300433 [PubMed: 22873480]

Brewer RA, Magnus M, Kuo I, Wang L, Liu TY, Mayer KH. The high prevalence of incarceration history among Black men who have sex with men in the United States: Associations and implications. American Journal of Public Health. 2014; 104(3):448–454. DOI: 10.2105/AJPH.2013.301786 [PubMed: 24432948]

Cole ER. Intersectionality and research in psychology. American Psychologist. 2009; 64(3):170. [PubMed: 19348518]

Earnshaw VA, Smith LR, Cunningham CO, Copenhaver MM. Intersectionality of internalized HIV stigma and internalized substance use stigma: Implications for depressive symptoms. Journal of Health Psychology. 2015; 20(8):1083–1089. DOI: 10.1177/1359105313507964 [PubMed: 24170015]

Fletcher JB, Kisler KA, Reback CJ. Housing status and HIV risk behaviors among transgender women in Los Angeles. Archives of Sexual Behavior. 2014; 43(8):1651–1661. DOI: 10.1007/s10508-014-0368-1 [PubMed: 25190499]

Forrest DW, Metsch LR, LaLota M, Cardenas G, Beck DW, Jeanty Y. Crystal methamphetamine use and sexual risk behaviors among HIV-positive and HIV-negative men who have sex with men in South Florida. Journal of Urban Health. 2010; 87(3):480–485. DOI: 10.1007/s11524-009-9422-z [PubMed: 20101468]

Freeman P, Walker BC, Harris DR, Garofalo R, Willard N, Ellen JM, Adolescent Trials Network for HIV/AIDS Interventions 016b Team. Methamphetamine use and risk for HIV among young men who have sex with men in 8 US cities. Archives of Pediatrics and Adolescent Medicine. 2011; 165(8):736–740. DOI: 10.1001/archpediatrics.2011.118 [PubMed: 21810635]

Garofalo R, Deleon J, Osmer E, Doll M, Harper GW. Overlooked, misunderstood and at-risk: exploring the lives and HIV risk of ethnic minority male-to-female transgender youth. Journal of Adolescent Health. 2006; 38(3):230–236. DOI: 10.1016/j.jadohealth.2005.03.023 [PubMed: 16488820]

Ghanem A, Little SJ, Drumright L, Liu L, Morris S, Garfein RS. High-risk behaviors associated with injection drug use among recently HIV-infected men who have sex with men in San Diego, CA. AIDS and Behavior. 2011; 15(7):1561–1569. DOI: 10.1007/s10461-011-9970-6 [PubMed: 21607643]

Glaze, LE., Kaeble, D. Correctional Populations in the United States, 2013 (NCJ 248479). 2014. Retrieved from http://www.bjs.gov/content/pub/pdf/cpus13.pdf

Halkitis PN, Solomon TM, Moeller RW, Doig SA, Espinosa LS, Siconolfi D, Homer BD. Methamphetamine use among gay, bisexual and non-identified men-who-have-sex-with-men: an analysis of daily patterns. Journal of Health Psychology. 2009; 14(2):222–231. DOI: 10.1177/1359105308100206 [PubMed: 19237489]

Herbst JH, Jacobs ED, Finlayson TJ, McKleroy VS, Neumann MS, Crepaz N, Team HAPRS. Estimating HIV prevalence and risk behaviors of transgender persons in the United States: a systematic review. AIDS and Behavior. 2008; 12(1):1–17. DOI: 10.1007/s10461-007-9299-3 [PubMed: 17694429]

Lim JR, Sullivan PS, Salazar L, Spaulding AC, Dinenno EA. History of arrest and associated factors among men who have sex with men. Journal of Urban Health. 2011; 88(4):677–689. DOI: 10.1007/s11524-011-9566-5 [PubMed: 21448578]

Maulsby C, Millett G, Lindsey K, Kelley R, Johnson K, Montoya D, Holtgrave D. HIV among black men who have sex with men (MSM) in the United States: A review of the literature. AIDS and Behavior. 2014; 18(1):10–25. [PubMed: 23620241]

Millett GA, Peterson JL, Flores SA, Hart TA, Jeffries WL, Wilson PA, Fenton KA. Comparisons of disparities and risks of HIV infection in black and other men who have sex with men in Canada, UK, and USA: A meta-analysis. The Lancet. 2012; 380(9839):341–348.

Millett GA, Peterson JL, Wolitski RJ, Stall R. Greater risk for HIV infection of black men who have sex with men: A critical literature review. American Journal of Public Health. 2006; 96(6):1007–1019. [PubMed: 16670223]

Milloy MJ, Kerr T, Buxton J, Montaner J, Wood E. Methamphetamine use and rates of incarceration among street-involved youth in a Canadian setting: a cross-sectional analysis. Substance Abuse Treatment, Prevention, & Policy. 2009; 4:17.doi: 10.1186/1747-597X-4-17

Patterson TL, Semple SJ, Zians JK, Strathdee SA. Methamphetamine-using HIV-positive men who have sex with men: correlates of polydrug use. Journal of Urban Health. 2005; 82(1 Suppl 1):i120–126. DOI: 10.1093/jurban/jti031 [PubMed: 15738313]

Quinn DM, Chaudoir SR. Living with a concealable stigmatized identity: the impact of anticipated stigma, centrality, salience, and cultural stigma on psychological distress and health. Journal of Personality and Social Psychology. 2009; 97(4):634–651. DOI: 10.1037/a0015815 [PubMed: 19785483]

Reback CJ, Fletcher JB. HIV prevalence, substance use, and sexual risk behaviors among transgender women recruited through outreach. AIDS and Behavior. 2014; 18(7):1359–1367. DOI: 10.1007/s10461-013-0657-z [PubMed: 24287786]

Reback CJ, Fletcher JB, Shoptaw S, Grella CE. Methamphetamine and other substance use trends among street-recruited men who have sex with men, from 2008 to 2011. Drug and Alcohol Dependence. 2013; 133(1):262–265. DOI: 10.1016/j.drugalcdep.2013.06.007 [PubMed: 23890490]

Reback CJ, Shoptaw S, Grella CE. Methamphetamine use trends among street-recruited gay and bisexual males, from 1999 to 2007. Journal of Urban Health. 2008; 85(6):874–879. DOI: 10.1007/s11524-008-9326-3 [PubMed: 18843536]

Reisner SL, Bailey Z, Sevelius J. Racial/ethnic disparities in history of incarceration, experiences of victimization, and associated health indicators among transgender women in the U.S. Women Health. 2014; 54(8):750–767. DOI: 10.1080/03630242.2014.932891 [PubMed: 25190135]

Santos GM, Rapues J, Wilson EC, Macias O, Packer T, Colfax G, Raymond HF. Alcohol and substance use among transgender women in San Francisco: prevalence and association with human immunodeficiency virus infection. Drug and Alcohol Review. 2014; 33(3):287–295. DOI: 10.1111/dar.12116 [PubMed: 24628655]

Semple SJ, Patterson TL, Grant I. A comparison of injection and non-injection methamphetamine-using HIV positive men who have sex with men. Drug and Alcohol Dependence. 2004; 76(2):203–212. DOI: 10.1016/j.drugalcdep.2004.05.003 [PubMed: 15488344]

Shoptaw S, Reback CJ. Associations between methamphetamine use and HIV among men who have sex with men: a model for guiding public policy. Journal of Urban Health. 2006; 83(6):1151–1157. DOI: 10.1007/s11524-006-9119-5 [PubMed: 17111217]

Taylor MM, Aynalem G, Smith LV, Montoya J, Kerndt P. Methamphetamine use and sexual risk behaviours among men who have sex with men diagnosed with early syphilis in Los Angeles County. International Journal of STDs and AIDS. 2007; 18(2):93–97.

Thomson N, Sutcliffe CG, Sirirojn B, Keawvichit R, Wongworapat K, Sintupat K, Celentano DD. Correlates of incarceration among young methamphetamine users in Chiang Mai, Thailand. American Journal of Public Health. 2009; 99(7):1232–1238. DOI: 10.2105/AJPH.2008.136648 [PubMed: 18923109]

Wilson EC, Chen YH, Arayasirikul S, Fisher M, Pomart WA, Le V, McFarland W. Differential HIV risk for racial/ethnic minority trans* female youths and socioeconomic disparities in housing, residential stability, and education. American Journal of Public Health. 2015; 105(S3):e41–e47. [PubMed: 25905826]

Wunsch G, Russo F, Mouchart M. Do we necessarily need longitudinal data to infer causal relations? Bulletin de Méthodologie Sociologique. 2010; 106:5–18. DOI: 10.1177/0759106309360114

Table 1

Sociodemographic Characteristics and Recent Substance Use of MSM and Trans Women

Characteristic	MSM (*n* = 6,243)		Trans Women (*n* = 1,176)		Total Sample (*n* = 7,419)		Sig.
	n	%	*n*	%	*n*	%	
Age (*n* = 7,405)							≤.001
25 or younger	1,153	18.5	350	29.8	1,503	20.3	
26 or older	5,079	81.5	823	70.2	5,902	79.7	
Race/Ethnicity (*n* = 7,405)							≤.001
Non-African American	5,472	87.8	927	79.0	6,399	86.4	
African American	760	12.2	246	21.0	1,006	13.6	
Self-report HIV status (*n* = 7,405)							≤.001
Not HIV positive	5,656	90.8	978	83.4	6,634	89.6	
HIV positive	576	9.2	195	16.6	771	10.4	
Housing status							≤.001
Housed	4,758	77.8	709	61.3	5,467	75.1	
Marginally housed	638	10.4	142	12.3	780	10.7	
Homeless	723	11.8	306	26.4	1,029	14.1	
Incarcerated in past 12 months (*n* = 7,339)							≤.001
No	5,575	90.3	848	73.0	6,243	87.5	
Yes	602	9.8	314	27.0	916	12.5	
Past 30-day methamphetamine use (*n* = 6,197)							
No	4,028	75.1	576	68.8	4,604	74.3	≤.001
Yes	1,332	24.9	261	31.2	1,593	25.7	

J Drug Issues. Author manuscript; available in PMC 2018 July 01.

Table 2

Logistic and Negative Binomial Regression Models for HIV, Recent Incarceration History, and Past 30-day Methamphetamine Use for MSM and Trans Women

Parameter	Logistic model (Dichotomous Outcome)		Negative binomial model (Count Outcome)	
	AOR	95% C.I.	AIRR	95% C.I.
Recent incarceration	6.00***	(4.98, 7.22)	3.57***	(2.71, 4.70)
Gender identity				
MSM (reference)	–	–	–	–
Trans women	0.99	(0.80, 1.23)	1.19	(0.90, 1.56)
Race/ethnicity				
Non-African American/Black (reference)	–		–	–
African American/Black	1.00	(0.84, 1.20)	1.02	(0.80, 1.30)
HIV status				
Not reported HIV positive	–	–	–	–
Reported HIV positive	2.76***	(2.30, 3.32)	2.08***	(1.59, 2.72)
Age				
25 or younger	–	–	–	–
26 or older	1.01	(0.87, 1.17)	1.06	(0.87, 1.30)
Gender identity × recent incarceration	0.62**	(0.43, 0.91)	0.80	(0.46, 1.75)

Note. AOR = Adjusted Odds Ratio,

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$

Table 3

Adjusted Odds Ratios (AOR) and 95% Confidence Intervals (CI) of Recent Incarceration History for MSM and Trans Women

Parameter	AOR	95% CI
Gender identity		
MSM (reference)	–	–
Trans women	5.20***	(3.74, 7.24)
Race/ethnicity		
Non-African American/Black (reference)	–	–
African American/Black	2.18***	(1.77, 2.69)
Self-reported HIV status		
Not reported HIV positive	–	–
Reported HIV positive	1.69***	(1.31, 2.16)
Age		
25 or younger (reference)	–	–
26 or older	1.20	(0.95, 1.52)
Gender identity × race/ethnicity	0.92	(0.64, 1.34)
Gender identity × HIV status	0.68	(0.44, 1.05)
Gender identity × age	0.56**	(0.39, 0.81)

Note. AOR = Adjusted Odds Ratio,

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$

Table 4

Multinomial Logistic Regression Model for Current Housing Status and Social Cofactors in MSM and Trans Women

Parameter	ARRR	95% CI
Housed (reference)	–	–
Marginally housed		
Recent incarceration	3.40***	(2.59, 4.47)
Gender identity	1.13	(0.89, 1.45)
Race/ethnicity	2.33***	(1.91, 2.86)
HIV status	1.88***	(1.48 2.40)
Age	0.30***	(0.26, 0.36)
Gender identity × recent incarceration	0.55*	(0.34, 0.35)
Intercept	0.25	(0.21, 0.29)
Homeless		
Recent incarceration	13.76***	(11.17, 16.94)
Gender identity	2.99***	(2.45, 3.66)
Race/ethnicity	3.29***	(2.75, 3.94)
HIV status	2.36***	(1.92, 2.91)
Age	0.52***	(0.43, 0.61)
Gender identity × recent incarceration	0.15***	(0.10, 0.22)
Intercept	0.12	(0.10, 0.14)

Note. RRR = Relative Risk Ratio,

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$

Table 5

Estimated Likelihood of Self-Reporting Recent Incarceration by Sociodemographic Profile, Calculated Using Logistic Regression Analysis (Confidence Intervals Derived Using Delta Method)

Sociodemographics				Estimated Probability of Incarceration (Past 12 Months)	Summary of Results			
Gender	Race	HIV Status	Age					
Male	W	HIV−	<26	7.2%	88% Male	63% White	63% HIV-Negative	50% < 26; 50% > 25
Male	W	HIV−	>25	8.5%				
Male	W	HIV+	<26	11.5%				
Male	W	HIV+	>25	13.5%				
Male	NW	HIV−	<26	14.4%				
Male	NW	HIV−	>25	16.8%				
TW	W	HIV−	>25	21.2%				
Male	NW	HIV+	<26	22.1%				
TW	W	HIV+	>25	23.7%	88% Trans Women	63% Non-White	63% HIV-Positive	50% < 26; 50% > 26
Male	NW	HIV+	>25	25.4%				
TW	W	HIV−	<26	28.6%				
TW	W	HIV+	<26	31.6%				
TW	NW	HIV−	>25	35.2%				
TW	NW	HIV+	>25	38.5%				
TW	NW	HIV−	<26	44.7%				
TW	NW	HIV+	<26	48.2%				

Note. W = Caucasian/White, NW = non-Caucasian/White.