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Drug use and sexual HIV transmission risk among men who have sex with men and women (MSMW), men who have sex with men only (MSMO), and men who have sex with women only (MSWO) and the female partners of MSMW and MSWO: A network perspective

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Abstract

We described drug use, sex risk, and STI/HIV among men who have sex with men and women (MSMW) and their female partners. We used the Network, Norms and HIV/STI Risk among Youth (NNAHRAY) study to evaluate drug use, sex risk, and biologically-confirmed STI/HIV in (1) MSMW and men who had sex with men only (MSMO) versus men who had sex with women only (MSWO) and (2) female partners of MSMW versus female partners of MSWO (N=182 men, 152 women). MSMW vs. MSWO had 30 to 60% increased odds of substance use, over twice the odds of multiple partnerships, and almost five times the odds of sex trade and HIV infection. Female partners of MSMW vs. female partners of MSWO had approximately twice the odds of substance use and 1.5 to 2 times the odds of multiple partnerships and sex trade. Interventions should address STI/HIV risk among MSMW and their female partners.

Keywords

HIV; substance use; MSMW; women; social network analysis

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

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INTRODUCTION

HIV remains a public health concern in the US and is concentrated among men who have sex with men (MSM), some of whom also have sex with women (MSMW) (1). High HIV incidence observed among MSMW corroborates evidence of high levels of HIV-related risk behaviors documented in this population (2–12). Some MSM may have female partners for multiple reasons including sexual identity or orientation (i.e. being bisexual), being in a primary relationship with a male and occasionally having sex with female(s) or vice versa (i.e. situational sexuality), or some may be involved with exchange sex with men (13–17). In addition minority MSMW report more stigma, internalized homophobia and other forms of discrimination that may influence decisions around sexual behavior and identity (18, 19).

MSMW tend to have higher numbers of female compared to male partners (20–22). Many MSMW fail to disclose their MSM status to their female partners (23–26) and often engage in risky sexual practices with their female partners, including engaging in anal intercourse (20) and condomless sex (12, 21). Extant studies also suggest elevated infection levels among female partners of MSMW. A study by Harawa et al. (2013) found that among women who only reported one sexual partner, sex with an MSMW was significantly associated with incidence and prevalence of HIV. Such data highlight the potential epidemiologic importance of MSMW as a bridge population to women (11, 12) and underscore the need to further describe HIV-related risk (e.g. drug use, sex risk behaviors, and sexually transmitted infection (STI)/HIV infection levels) among MSMW to more fully appreciate risk to their female partners (12).

While MSMW may confer risk to their female partners, extant studies suggest female partners of MSMW also may engage in risk-taking behaviors that contribute to their own and their male partner's HIV risk (12, 20, 27). For example, a study of female partners of Black MSMW found that minority women with MSMW partners, in general, seem to have social networks that involve high rates of risky sexual behaviors and riskier partners than other women (12). Furthermore, the same study found that female partners of MSMW were more likely to report other HIV/AIDS risk behaviors such as: sex trading, substance use, multiple sex partners, and having other risky sexual partners (sex workers, HIV+, and injection drug users (IDUs) (12).

A limitation of current studies on female partners of MSMW however, is that data on women's behavior or characteristics is based on report of their male partners (10, 28, 29). It is possible that male partners may inaccurately report on their female partner's characteristics either because they are unaware of partner's risk-taking or as a result of recall or social desirability bias.

One excellent way of describing risk for both MSMW and their female partners is to employ network data where data is collected from both members of the partnership. Network data where male and female partners of a dyad are interviewed allows a comparison of MSWO to MSMO and MSMW, as well as females whose partners are MSMW and females whose partners are MSWO. The current study, through its utilization of a network-chain approach for recruiting participants allow for the examination of these relationships. Few studies have

been conducted that include data on both partners of a network that also include biologic data on STI/HIV, as is the case with the current study sample.

Risk networks are pathways along which HIV risk travels in peer groups, and in this case, couples. The cores of large components can be centers of high-risk behaviors and can become pockets for HIV risk and infection (30–32). One benefit of an investigation comparing the individual risks of men and of women with different sexual partner patterns using network data is the ability to describe the degree to which high risk sexual and substance use behavior among both members of the partnership may have the potential to increase risk to members within and outside the partnership and in fact to their larger sexual network.

The purpose of the current study was to evaluate HIV drug and sex risk comparing MSMW and MSWO to MSWO, as well as evaluating HIV drug and sex risk comparing female partners of MSMW and female partners of MSWO. Specifically, we sought to examine whether MSMW have elevated levels of substance use, sex risk, and STI or HIV infection compared to MSWO and whether female partners of MSMW have elevated risk compared with women whose partners are MSWO. While it has been hypothesized that MSMW are a primary source of STI and HIV infection for women (12, 33, 34), we hypothesize that women with MSMW partners may also engage in elevated individual risk behaviors compared to women with MSWO partners.

METHODS

Participants

Recruitment for the Network, Norms and HIV/STI Risk among Youth (NNAHRAY) study has been previously described by Friedman et al. (35) and Khan et al. (36, 37) NNAHRAY collected network data and specimens for STI/HIV testing from 2002–2004. A total of 465 adults aged 18 years or older were recruited, including 112 index cases (initially recruited participants) and 353 identified risk contacts (sexual or drug using partners of index cases or of their extended risk networks). Index cases were recruited from three categories of Bushwick, New York residents, comprising one population-representative sample and two non-representative samples. The population-representative sample of index cases were 66 individuals aged 18 to 30 years, recruited door-to-door within randomly selected neighborhood blocks. Of these, 25 had been included in a population-representative sample of Bushwick youth during a previous study (27) and 41 were members of households targeted during that study who were too young to participate at that time, but who were aged 18 years or older during the NNAHRAY study. In addition, a convenience sample of injection drug user (IDU) index cases was recruited ($n = 38$), including members of a population of IDUs specifically targeted during the earlier study, walk-ins who met study criteria, and those recruited by project staff in known drug-purchasing venues, shooting galleries, or needle exchanges in Bushwick. IDUs had to have injected drugs within the prior 3 months and have visible track marks or provide other evidence of current injection during detailed verbal questioning. Finally, a convenience sample of individuals involved in a group sex party culture were recruited as index cases ($n = 8$).

Through a risk-network tracing process that involved participants bringing their partners in to be interviewed, or giving them a coupon to be redeemed, or our staff locating the partner and recruiting them, 353 additional participants were directly or indirectly linked to one or more of the total of 112 index cases. Participants were considered to be “linked” if one named the other as someone with whom, during the prior 3 months, they had a) injected drugs, b) had sex, and/or c) attended a group sex event. Eligibility requirements included being at least 18 years of age and, for index cases, residing in Bushwick. IDU index cases had to have injected drugs within the prior 3 months, and have visible track marks and/or provide other evidence, during detailed verbal questioning, of having injected during the prior 3 months. In all then, 465 participants were recruited.

Index participants were asked to name up to 10 individuals with whom they had had sex during the prior 3 months, and up to two individuals with whom they had attended a groupsex event during the same time period. This was increased to eight late in the project when we started recruiting attendees at MSM group sex parties and their networks. In addition, IDU participants were asked to name up to five individuals with whom they had injected during the prior 3 months. The network sampling began by recruiting these named individuals up to a limit of 10 sex partners, five IDU partners, and two group sex attendance partners. However, only 8% of participants reported sex with more than 10 partners in the last 3 months; and 16% of current IDUs reported injection with more than five partners in the last 3 months. Successfully recruited links were interviewed as well, and their partners were recruited also. For any given index participant, we limited the number of sex partner, group sex attendance partner and injection partner steps to three (i.e. we would recruit the partner of the partner of the partner of the index case). In addition, for each IDU recruited as a link of an index case, we would recruit their sex partners (and group sex attendance partners) and the sex partners (and group sex attendance partners) of these partners. After we reached our sample goal of 200 IDUs, we no longer recruited known injectors (35).

Eligible participants who provided written informed consent were enrolled. Staff administered a structured face-to-face sexual behavior and drug use survey that assessed sociodemographic characteristics, drug use, sexual and drug risk behaviors, size and composition of sexual and drug networks, perceived levels of social support and burden, experiences with discrimination, peer norms, participants’ own norms, measures of community activism, and measures of health activism. After the completion of the survey, staff collected blood and urine for HIV/STI and drug metabolite testing and provided a cash incentive (\$20 for the interview, \$10 for blood sample, and \$10 for urine sample). As described previously (35) a venous blood sample was tested for HIV, HCV and HBV with an enzyme-linked immunosorbent assay (ELISA; Abbott Laboratories, Abbott Park, IL) and a Western blot (BioRad Laboratories, Hercules, CA); for herpes simplex virus-2 (HSV-2) with a type-specific ELISA (HerpeSelect, Focus Technologies, Cypress, CA); and for syphilis with a rapid plasma reagin test (Wampole Laboratories, Princeton, NJ) confirmed by a *Treponema pallidum* particle agglutination antibody assay (Serodia, Fujirebio Diagnostics, Malvern, PA). Urine was tested for chlamydia and gonorrhea with a nucleic acid amplification test (BDProbeTec ET Chlamydia trachomatis/Neisseria gonorrhoeae Amplified DNA Assays, BD Diagnostic Systems, Sparks, MD).

Since we examined the sexual risk histories, STI and/or HIV infection of both MSMW and their female partners the analytic sample for this paper was restricted to respondents involved in at least 1 sex partnership in the past 3 months for which interview data for both members of the partnership were available (men: N=182; women: N=161); representing 296 sexual partnerships in the data set. We excluded (N=9) women whose partners were women only (WSWO), resulting in an analytic sample of men: N=182 and women: N=152.

Because each of these 334 individuals was a participant in the NNAHRAY study, each responded to the structured face-to-face sexual behavior and drug use survey and was offered STI and HIV testing. Using responses to past 3-month partner type, we classified men as having sex with women only (MSWO), having sex with men only (MSMO) or having sex with both men and women (MSMW). For women, we classified those reporting that their partners had sex with men during the past 3 months as women whose partners were MSMW and those reporting that their partner only had sex with women at women whose partners were MSWO. We evaluated recent drug use, sex risk, and biologically-confirmed STI and HIV in MSMW, MSMO and MSWO, as well as female partners of MSMW and female partners of MSWO.

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Measures

Outcomes

Recent Non-injection Drug Use: We examined non-injection heroin, cocaine and crack use in the past 30 days by dichotomizing variables that originally asked the frequency of use of each of these substances in the past 30 days. For each of the three substances, respondents who answered “0” were coded as “No,” whereas respondents who answered otherwise, were coded “Yes.”

HIV-related Sexual Risk

Multiple Partners: Respondents reported the number of sex partners they had in the past three months. Those who endorsed two or more partnerships were considered to have multiple partnerships.

High Number of Sex Partners: Those who had greater than the median number of sex partners in the past three months (≥ 20 for men and ≥ 10 for women) were considered to have a high number of sex partners.

Sex Trade Involvement: Respondents who endorsed exchanging sex for drugs or money in the past three months were coded as engaging in sex trade.

Group Sex Involvement: We examined involvement in group sex by coding a variable asking respondents “Of all your friends and acquaintances, how many have ever participated in a threesome, foursome, or other group of people who get together and have sex?” And

then a subsequent question that asked “In the last year, how many times have you done this?” Those who indicated their own involvement in a group sex event were categorized as having group sex involvement.

STI and HIV Infection: We examined dichotomous indicators of HIV infection and STI, defined as biologically- confirmed infection with HSV-2, chlamydia, gonorrhea or syphilis.

Statistical Analyses

For all analyses, we used survey commands in STATA SE 12.0 software (38). We calculated prevalences and means of sociodemographic and behavioral variables amongst the sample. T-tests (for continuous variables) and chi-square (χ^2) tests (for categorical variables) were used to compare differences in sociodemographic, STI and HIV, as well as substance use characteristics. We then examined bivariable relationships by calculating prevalence ratios and 95% confidence intervals for the associations between being MSMW and being a female partner of MSMW and HIV-related sexual risk, as well as HIV infection. Multivariable analyses controlled for race/ethnicity, education and income. We used a generalized linear model for binomial outcomes, with log link, Poisson distribution without an offset, and a robust variance estimator. Utilizing the same regression methods, we estimated unadjusted and adjusted prevalence ratios and 95% confidence intervals for the associations between MSMW and female partner of MSMW and HIV-related sexual risk and STI and HIV infection. The referent group for the multivariate analyses for MSMW and their female partners were MSWO and female partners of MSWO, respectively. Note that for each outcome there are different sample sizes due to missing data.

RESULTS

Demographic Characteristics

Table 1 shows the sociodemographic characteristics for the study sample. Among the 334 individuals (182 male; 152 female) involved in at least 1 sex partnership, a total of 296 sex partnerships occurred for which we had interview data from both members.

Of the 334 individuals included in the analytic sample, a little more than half (53%) were male, approximately 70% were Latino, and 21% were Black. The median age for the sample was 29 years (30 years among men, 27 years among women), approximately 44% had less than a high school education, and 80% reported being unemployed at the time of the interview (Table 1). Almost half the sample was HSV-2 infected, including 60% of the women. Compared to men, women were significantly more likely to have been infected with HSV-2. Nearly one-third of the men in the sample reported injection drug use.

Table 2 shows the unadjusted and adjusted models of lifetime substance use, HIV-related sexual risk, and STI and HIV infection among MSMW and MSMO as compared with MSWO. Table 3 shows the unadjusted and adjusted models for the same outcomes but among female partners of MSMW compared to female partners of MSWO. Our presentation below focuses on the adjusted models, in which age, race and income level were controlled. We additionally controlled for IDU status for the HIV infection outcome.

Lifetime Substance Use—There were significant differences in odds of substance use for MSMW and MSMO versus MSWO. MSMW had 41% increased odds of using non-injection heroin compared to MSWO. Both MSMO and MSMW had significantly higher odds of using cocaine compared to MSWO, with MSMW reporting 26% increased odds and MSMO reporting 39% increased odds. MSMW and MSMO also reported increased odds of crack use compared to MSWO. Neither MSMW nor MSMO was significantly more likely to inject drugs than MSWO.

Significant differences were also noted among the female partners of the men (Table 3). Female partners of MSMW reported higher odds of non-injection heroin, crack, and injection drug use, than women whose partners were MSWO.

HIV-and STI-related sexual risk—MSMW were more likely to report having multiple partnerships and to have a high (≥ 20) number of sex partners compared to MSWO. Both MSMW and MSMO had much higher odds of reporting involvement in sex trade compared to MSWO. MSMW and MSMO both had more than twice the odds of group sex involvement compared to MSWO.

Female partners of MSMW were also more likely to report engaging in HIV-related sexual risk compared to women whose partners were MSWO. Female partners of MSMW had a 73% increased odds of having multiple partnerships compared to women whose partners were MSWO. Female partners of MSMW had 82% higher odds being involved in sex trade compared to the MSWO partnered women. However, they were not more likely to be involved in group sex.

STI and HIV infection—MSMW in the sample had a 57% increased odds of having an STI and almost 5 times the odds of being HIV positive, whereas MSMO had almost 4 times the odds of being HIV positive compared to MSWO. Female partners of MSMW were more likely, although not significantly so, to be HIV infected than MSWO partnered women, but not more likely to be infected with an STI.

DISCUSSION

NNAHRAY data enabled investigation of the drug and HIV-related sexual risks of both members of the dyadic network (e.g. MSMW and their partners) to elucidate the multifaceted nature of risk involvement in partnerships where there are elevated levels of STI and HIV infection. Within the sexual networks of MSMW and their female partners, this study sought to explore risk for both members of the network.

Specifically, compared with MSWO, MSMO and MSMW had increased odds of non-injected heroin, cocaine, and crack use compared with MSWO; increased odds of sexual risk behaviors such as multiple partnerships, sex trade; and higher odds of HIV infection. Findings from the current study suggest MSMW pose a significant risk of HIV infection to female members of their sexual networks, supporting previous work that highlights the increased vulnerability and HIV-related risk among MSMW compared to MSWO (18, 20, 39). The findings also indicate a gradient for several outcomes including injection drug use,

multiple partnerships, having a high number of partners, involvement in sex trade, lifetime STI and HIV infection. This trend shows that prevalence for MSMW was greater than that of MSMO, which was greater than that of MSWO. For non-injection cocaine and crack, prevalence was highest in MSMO followed by MSMW and finally MSWO. These trends indicate a high burden of substance use and sexual risk among MSMW excepting injection drugs where the burden lies more commonly among MSMO.

Female partners of MSMW, compared with women whose male partners were MSWO had increased odds of non-injected heroin and crack use, injection drug use, and some risk behaviors such as multiple partnerships. Levels of STI were comparable among female partners of MSMW and other women. The prevalence of HIV infection among female partners of MSMW appeared to be double (12%) that of other women (6%), this difference was not statistically significant at the 0.05 level, this was due to low power to detect associations given the modest sample size. While network data are incredibly rich and enable rigorous examination of dyadic risk, network studies are highly intensive to conduct and a resulting limitation is limited sample size. Our results, with prior extant evidence of elevated HIV infection among female partners of MSMW (12), highlight the need to measure HIV infection levels among female partners of MSMW in larger population-based samples.

These findings also indicate that female partners of MSMW are high risk in terms of substance use and HIV-related sexual risk and point to the need to further examine the association between being a female partner of MSMW and STI/HIV risk.

This study is among the first to examine the bidirectional nature of risk between MSMW and their female partners utilizing data from both members of the dyad, establishing the potential for MSMW to confer risk onto their female partners while also examining the potential for their female partners to confer risk onto MSMW or at least the degree to which they engage in risk themselves beyond that of having a high risk partner (12).

Though this study assists in closing gaps in the literature regarding female partners of MSMW and MSWO, it is not without limitations. In addition to the limited sample size and cross-sectional data structure, the data were collected in 2002. Therefore, the results may not be generalizable to populations outside of the NNAHRAY network. However, it is rare to find this level of behavioral data for both members of a dyad, especially where one member is MSM. Therefore we feel that the findings from this study are informative and provide support for future research that seeks to consider network data among MSM and their partners. The study includes a convenience sample of IDUs and participants of group sex parties, which may also result in sampling bias and affect generalizability of study findings. Additionally, misclassification bias may be a problem with female partners of MSWO who may have been classified as such but may be unaware of having partners that are MSMW; to some extent, at least, NNAHRAY network data avoid this limitation. Misclassification bias is also a potential when categorizing men into behavioral risk groups using data collected over a short time duration and suggests perhaps including a longer time frame for follow-up to capture risk in MSMW, MSMO and MSWO. Nonetheless, the results provide preliminary evidence of the multifaceted HIV-related risk among men and women within the same

network, challenging theory that bridging is a unidirectional phenomenon. The results highlight a need for additional studies on risk and STI and HIV infection, and the role of links to high-risk partners in different populations, as well as the need for development of longitudinal network studies conducted to elucidate the prospective relationship between risk and infection and to better identify the multiple pathways through which bidirectional risk works to influence STI and HIV.

CONCLUSIONS

This study highlights the need for relationship-tailored and relationship focused studies and interventions that address the multifaceted nature of risk within the male and female partnerships of MSMW. Interventions should focus on women's own recognition of their risk. Furthermore, interventions tailored to both partners (40, 41), as opposed to only one member of the dyad, may have greater likelihood of addressing patterns of behavior that may be deemed non-traditional yet normative (i.e. involvement in group sex). Additionally, research aimed at recruiting both MSMW and their female partners should focus on network specific elements of the relationship where risky behaviors may be prevalent and normative.

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Table 1

Characteristics of Participants with at least One Sexual partner (N=334)

	Total n=334 n (%)	Men n=182 n (%)	Women n=152 n (%)	test statistic (p value)
Age, median**	29	30	27	t=1.38 (p=0.15)
Race/Ethnicity				$\chi^2=12.93$ (p<.05)
Black	68 (20.3)	45 (66.2)	23(33.8)	
Hispanic	234 (70.1)	127 (54.3)	107 (45.7)	
Other	32 (9)	10 (31.3)	22 (68.8)	
Education				$\chi^2=11.51$ (p<.01)
Less than High School	145 (49.3)	71 (43.6)	74 (56.4)	
High School	107 (36.4)	72 (44.2)	35 (26.7)	
College	40 (13.6)	20 (12.2)	20 (15.3)	
Post Graduate	2 (0.7)	0 (00.0)	2 (1.5)	
Employment Status (Current)				
Employed	67 (19.8)	44 (65.7)	23 (34.3)	$\chi^2=4.22$ (p<.05)
Unemployed	267 (80.2)	138 (51.7)	129 (48.3)	
Sexually Transmitted Infections				
HSV-2 Infected	163 (50.8)	73 (42.2)	90 (60.8)	$\chi^2=11.05$ (p<.01)
Chlamydia	20 (6.4)	11 (6.4)	9 (6.2)	$\chi^2=0.01$ (p=0.92)
Syphilis	10 (3.1)	4 (2.3)	6 (4.0)	$\chi^2=2.86$ (p=0.24)
Gonorrhea	3 (0.9)	0 (0.0)	3 (2.0)	$\chi^2=6.82$ (p=0.08)
HIV Infection				
HIV Infection	35 (11.2)	25 (14.5)	10 (7.1)	$\chi^2=4.32$ (p<.05)
Recent Drug Use (Past 3 months)				
Crack Use	110 (32.9)	62 (34.1)	48 (31.6)	$\chi^2=0.02$ (p=0.63)
Cocaine	106 (31.7)	63 (34.6)	43 (28.3)	$\chi^2=1.53$ (p=0.22)
IDU	112 (33.5)	74 (30.7)	38 (25.0)	$\chi^2=9.11$ (p<.01)
Marijuana	209 (62.6)	118 (64.9)	91 (59.9)	$\chi^2= 0.87$ (p=0.35)

* N for a given variable may not sum to column total due to missing values

Table 2

Unadjusted and Adjusted Models of Lifetime HIV-related Risk among MSMW and MSMO (N=182)

Non-Injection Heroin Use	N	%	UPR(95%CI) *	APR(95%CI) **
MSWO	84	58.7	Ref.0.92	Ref.1.04
MSMO	7	53.9	(0.54–1.55)1.47	(0.59–1.84)1.41
MSMW	19	86.4	(1.18–1.82)	(1.08–1.84)
Non-Injection Cocaine Use				
MSWO	97	67.8	Ref.1.36	Ref.1.39
MSMO	12	92.3	(1.12–1.62) 1.34	(1.10–1.76) 1.26
MSMW	20	90.9	(1.13–1.60)	(1.05–1.52)
Non-Injection Crack Use				
MSWO	64	44.8	Ref.1.72	Ref.1.84
MSMO	10	76.9	(1.21–2.44)1.63	(1.27–2.68)1.60
MSMW	16	72.7	(1.86–2.22)	(1.15–2.24)
Injection Drug Use				
MSWO	62	42.2	Ref.1.09	Ref.1.20
MSMO	6	46.2	(0.59–2.13)1.16	(0.56–2.47)1.08
MSMW	11	50	(0.75–1.88)	(0.64–1.81)
Multiple Partnerships				
MSWO	63	42.9	Ref.1.43	Ref.1.53
MSMO	8	61.5	(0.90–2.29)2.33	(0.92–2.54)2.48
MSMW	22	100	(1.93–2.81)	(1.99–3.08)
High Number of Partners (>=20)				
MSWO	58	39.5	Ref.1.36	Ref.1.47
MSMO	7	53.6	(0.72–2.35)1.84	(0.80–2.70)1.81
MSMW	16	72.7	(1.33–2.55)	(1.30–2.53)
Giving or Receiving Goods for Sex				
MSWO	25	17	Ref.3.13	Ref.3.55
MSMO	7	53.9	(1.71–5.88)4.54	(1.85–6.79)4.68
MSMW	17	77.3	(2.96–6.94)	(2.99–7.32)
Group Sex Involvement				
MSWO	53	36.1	Ref.2.13	Ref.2.31
MSMO	10	76.9	(1.48–3.08)2.52	(1.60–3.36)2.81
MSMW	20	90.9	(1.96–3.25)	(2.10–3.77)
Lifetime STI Infection (Any STI)				
MSWO	62	45.3	Ref.1.18	Ref.1.28
MSMO	7	53.6	(0.70–2.04)1.51	(0.78–2.10)1.57
MSMW	13	68.4	(1.06–2.16)	(1.06–2.31)
HIV Infection [‡]				
MSWO	12	8.6	Ref.2.92	Ref.3.81
MSMO	3	25	(0.95–8.96)5.83	(1.15–12.56)4.82
MSMW	10	50	(2.90– 11.73)	(2.17–10.70)

*
UPR = Unadjusted Prevalence Ratios

**
APR = Adjusted Prevalence Ratios

Note: All adjusted models control for age, race and income

[‡] Adjusted for all covariates AND Injection Drug Use

Note: N for a given outcome may not sum to the sample total due to missing values

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Table 3

Unadjusted and Adjusted Models of Lifetime HIV-related Risk among Female Partners of MSWO and MSMW (N=152)

Non-Injection Heroin Use	N	%	UPR(95%CI)*	APR(95%CI)**
Female Partners of MSWO	41	37.3	Ref.1.84	Ref.1.47
Female Partners of MSMW	26	68.4	(1.33–2.54)	(1.06–2.04)
Non-Injection Cocaine Use				
Female Partners of MSWO	66	60	Ref.1.32	Ref.1.15
Female Partners of MSMW	30	78.9	(1.05–1.65)	(0.93–1.43)
Non-Injection Crack Use				
Female Partners of MSWO	42	38.2	Ref.1.93	Ref.1.51
Female Partners of MSMW	28	73.7	(1.42–2.62)	(1.13–2.03)
Injection Drug Use				
Female Partners of MSWO	27	23.9	Ref.	Ref.
Female Partners of MSMW	21	53.8	2.25(1.45–3.50)	1.78(1.14–2.79)
Multiple Partnerships				
Female Partners of MSWO	45	39.8	Ref.1.67	Ref.1.73
Female Partners of MSMW	26	66.7	(1.22–2.30)	(1.24–2.36)
High Number of Partners (>=10)				
Female Partners of MSWO	62	54.9	Ref.1.31	Ref.1.24
Female Partners of MSMW	28	71.8	(1.01–1.69)	(0.96–1.62)
Giving or Receiving Goods for Sex				
Female Partners of MSWO	26	23	Ref.2.01	Ref.1.82
Female Partners of MSMW	18	46.2	(1.24–3.24)	(1.10–2.99)
Group Sex Involvement				
Female Partners of MSWO	26	23	Ref.1.34	Ref.1.27
Female Partners of MSMW	12	30.8	(0.75–2.39)	(0.71–2.28)
Lifetime STI Infection (Any STI)				
Female Partners of MSWO	68	61.8	Ref.1.14	Ref.1.03
Female Partners of MSMW	26	70.3	(0.90–1.47)	(0.80–1.33)
HIV Infection [‡]				
Female Partners of MSWO	6	5.6	Ref.2.09	Ref.1.68
Female Partners of MSMW	4	11.8	(0.63–7.02)	(0.47–6.08)

* UAR = Unadjusted Prevalence Ratios

** AOR = Adjusted Prevalence Ratios

Note: All adjusted models control for age, race, and income

[‡] Adjusted for all covariates AND Injection Drug Use

Note: N for a given outcome may not sum to the sample total due to missing values