Characteristics and Risk Behaviors of Men Who Have Sex With Men and Women Compared With Men Who Have Sex With Men—20 US Cities, 2011 and 2014

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Abstract

Background—Men who have sex with men (MSM) are heterogeneous with respect to sexual behavior. We examined differences in sex behaviors between men who have sex with men and women (MSMW) and men who have sex with men only (MSMO).

Methods—Data for this analysis were from MSM who participated in National HIV Behavioral Surveillance in 2011 and 2014. We used the combined years to evaluate demographic and behavioral differences between MSMW and MSMO. Using log-linked Poisson regression models, adjusted prevalence ratios (aPR) were calculated for behavioral outcomes.

Results—Overall, 2042 (11.9%) participants were classified as MSMW. MSMW were less likely than MSMO to have condomless sex with male partners [aPR 0.77; 95% confidence interval (CI): 0.74 to 0.81] and to have been diagnosed with another sexually transmitted disease (aPR 0.83; 95% CI: 0.72 to 0.95). MSMW were more likely than MSMO to have given money or drugs for sex (aPR 2.85; 95% CI: 2.52 to 3.24) or received money or drugs for sex (aPR 2.64; 95% CI: 2.37 to 2.93) and to ever have injected drugs (aPR 2.05; 95% CI: 1.80 to 2.34). MSMW had more total sex partners (median 6, interquartile range: 4–11 vs. 3, 2–8), casual sex partners (5, 2–10 vs. 3, 1–7), and condomless sex partners (2, 1–4 vs. 1, 0–2) in the last 12 months ($P < 0.01$ for all comparisons).

Conclusions—MSMW have distinct sexual risk behaviors from MSMO and may contribute to HIV transmission among women. MSMW could benefit from tailored interventions to reduce HIV risk behaviors.

Keywords

HIV; MSM; men who have sex with men and women (MSMW); bisexual men; United States

INTRODUCTION

Men who have sex with men (MSM) are disproportionately burdened by HIV in the United States.[1] According to the US Centers for Disease Control and Prevention (CDC), MSM accounted for 54% of estimated HIV diagnoses in the United States in 2014,[2] despite representing only 2% of the population.[3] Reductions in HIV-related stigma and ongoing improvements in treatment options for persons living with HIV may lead to behavioral disinhibition that puts MSM at increased risk of HIV.[4] Simultaneously, however, reduced stigma may lead to greater disclosure of same-sex behaviors, and other positive health outcomes, such as reduced stress and increased disclosure of HIV serostatus to sex partners, thereby increasing opportunities for HIV prevention.[5]

MSM, however, are heterogeneous with respect to sexual risk behaviors. Previous studies reported that compared with men who have sex with men only (MSMO), men who have sex with men and women (MSMW) may have less frequent condom use,[6–10] be more likely to use drugs during sex,[11,12] and exchange drugs or money for sex.[11–13] In addition, MSMW may be less likely to engage in protective behaviors such as testing for HIV.[14] Frequent HIV testing is essential for early diagnosis and initiation of treatment, which improves HIV prognosis. In addition, early diagnosis and initiation of treatment reduces transmission through modifying risky sexual behaviors and suppressing viral load from antiretroviral therapies.[15] Disclosure of same-sex behavior to friends and health care providers may be associated with fewer sexual risk behaviors because of reduced stress, improved mental and physical health, and access to social networks that encourage safer sexual behaviors.[16] Unfortunately, studies have found that because of factors including stigmatization and a fear of decreased masculinity, MSMW are less likely to disclose their sexuality to friends and health care providers than heterosexual men or other MSM.[17–20] Disclosure to health care providers may also be associated with testing for HIV.[21] This is important because MSMW have been found to be 5 times more likely to be HIV positive than heterosexual men, although only half as likely to be HIV positive as other MSM.[22] This has fueled speculation about the impact of bisexual behavior on the HIV prevalence among female sex partners of MSM. Although there is ongoing debate on the subject,[23,24] most HIV infections among heterosexual women may be linked with HIV infections among MSM.[25]

Describing demographics and sexual risk behaviors of MSMW compared with MSMO can help target effective HIV testing and prevention interventions to reduce the burden of disease in the MSMW community. This analysis compared MSMW with MSMO to determine differences in sexual risk and HIV prevention behaviors. Second, among MSMW, we determined the associations between sexual risk behaviors and partner gender.

METHODS

Setting and Study Design

We used data from National HIV Behavioral Surveillance (NHBS), an ongoing surveillance system that conducts cross-sectional surveys among populations at highest risk for HIV infection. Details of the NHBS operations and sampling procedures have been described elsewhere.[26] We used data from MSM recruited for interviews and HIV testing through venue-based, time-space sampling in 20 US cities in 2011 and 2014. Data for the 2 survey years were combined for analysis.

Eligible study participants were men 18 years old, who were born male and identified as male at the time of the survey, and who self-reported ever having oral or anal sex with a man. In addition, participants were required to live in the participating metropolitan statistical areas and be able to complete the survey in either English or Spanish. All participants gave informed consent before beginning the survey. Participants who gave consent to have an HIV test were given either a standard blood or rapid test followed by laboratory confirmation in accordance with local procedures. MSM with complete and valid interview data and a valid HIV test result who were currently sexually active, defined as having 1 male partner in the past 12 months, were included in analysis. Validity was assessed by the interviewer's confidence in the respondent's answers; interviewers received in-person training on administering the questionnaire, and interviews they marked invalid were excluded from analysis.

Definitions

MSMO were defined as participants who reported only male sexual partners in the 12 months preceding the survey. MSMW were defined as participants with at least 1 male and at least 1 female partner in the last 12 months.

Participants who had anal sex with at least 1 male partner in the last 12 months without using a condom were defined as having condomless anal sex with male partners, and participants who had vaginal or anal sex with at least 1 female partner in the last 12 months without using a condom were defined as having condomless female sex. Any condomless sex was defined as having sex without using a condom with at least 1 male or 1 female partner, either anal or vaginal. The total number of condomless sex partners was determined by adding the number of condomless male anal sex partners to the maximum value between condomless vaginal and condomless anal female sex partners. Because participants were asked for the number of condomless vaginal and condomless anal female sex partners in the last 12 months separately, we could not calculate the total number of condomless female sex partners because adding these 2 numbers would double-count partners with whom participants had both vaginal and anal sex. Main sexual partners were those with whom the participant felt committed and would call his boy/girlfriend, significant other, or spouse. A casual partner was defined as a sexual partner with whom there was no commitment or who was not well known.

Participants were asked if they had disclosed their same-sex attraction to anyone, and those answering yes were subsequently asked if they had told gay-identified friends, non–gay-

identified friends, family, and/or health care providers. Participants answering in the affirmative to any party were defined as disclosing to that party.

Awareness of HIV status was determined by comparing self-reported status with the laboratory confirmation of their test results. Participants who tested positive and had previously self-reported being HIV-positive were defined as aware of their infection. Participants who tested positive but did not self-report their status were not included.

Concurrent partnerships were determined by the participant's answers pertaining to his last sexual partners, male and female. If the participant stated that he had sex with other people while in a sexual relationship with that most recent partner or if he believed that partner "probably did" or "definitely did" have sex with others while in their relationship, the relationship was defined as concurrent. Conversely, if the respondent did not report concurrent sex and believed his partner probably or definitely did not have sex with another person while in their relationship, it was defined as nonconcurrent. One-night stands were categorized separately.

Binge drinking was defined as having 5 or more alcoholic drinks in a single setting. Ever injecting drugs was defined as injecting any drug that was not prescribed.

Participants were asked if they had been told by a doctor or health care provider in the previous 12 months that they had gonorrhea, chlamydia, syphilis, or any other sexually transmitted diseases (STDs) other than HIV. If the participant answered "yes" to 1 or more of those questions, he was defined as having another STD in the previous 12 months.

Statistical Analysis

To assess the bivariate association between MSMW vs. MSMO participant demographics and behaviors, we calculated prevalence differences with 95% confidence intervals (CIs) from beta coefficients from log-linked binomial regression models, which were not adjusted for covariates. Chi-square tests were used for statistical significance. For selected outcomes (condomless anal sex with male partners, ever injecting drugs, received money or drugs for sex, gave money for drugs or sex, diagnoses of other STDs, HIV testing, and disclosure to health care provider), we evaluated if MSMW status was associated with the outcome after adjusting for potential confounders and estimated adjusted prevalence ratios (aPR) and 95% CIs using log-linked Poisson regression models with generalized estimating equations. All models were clustered on recruitment event. Race was considered as an effect measure modifier. Modeling results were stratified by race (black MSMW, black MSMO, white MSMW, white MSMO, Hispanic/Latino MSMW, Hispanic/Latino MSMO, other MSMW, and other MSMO) to elucidate any meaningful differences. Covariates associated with the outcomes in bivariate analyses with *P* values less than 0.10 were considered as confounders in the multivariable models, and backward elimination was used to reduce models until only significant covariates remained, with a *P* value less than 0.05. All statistical analyses were performed using SAS version 9.3.

NHBS activities were approved by local institutional review boards in each participating city. NHBS activities were determined to be research in which the CDC were not directly engaged and did not require review by the CDC's institutional review board.

RESULTS

Study Sample and Demographics

A total of 17,214 men were included in the analysis—8460 (49%) from the 2011 survey and 8754 (51%) from the 2014 survey. Seven participants had missing values pertaining to their sexual behavior with women and were excluded from the analysis, leaving a final sample size of 17,207. Overall, a plurality of participants were white and a majority identified as homosexual, with a median age of 31 (Table 1). In total, 12% (n = 2042) were classified as MSMW and 88% (n = 15,165) were classified as MSMO. Compared with MSMO, MSMW were more likely to be black (40% vs. 25%; $P < 0.0001$), identify as bisexual (75% vs. 9%; $P < 0.0001$), have an annual household income below $20,000 USD (48% vs. 30%; $P < 0.0001$), and to reside in the southern United States (50% vs. 42%; $P < 0.0001$). MSMW were less likely than MSMO to self-report being HIV positive (10% vs. 17%; $P < 0.0001$) and less likely to have a positive HIV test result (17% vs. 20%; $P = 0.0009$). Among the 352 MSMW who tested positive, 183 (52%) were unaware and 169 (48%) were aware, whereas among 3086 MSMO who tested positive, 805 (26%) were unaware and 2281 (74%) were aware (data not shown). Thus, MSMW were twice as likely as MSMO to be unaware of their HIV-positive status (52% vs. 26%; $P < 0.0001$).

Sexual Risk Behaviors

Overall, participants reported a median of 4 [interquartile range (IQR) 2–9] sex partners in the last 12 months, 66% reported any condomless sex in the last 12 months, 62% reported condomless anal sex with male partners in the last 12 months, and 6% and 9% reported giving and receiving, respectively, money or drugs in exchange for sex in the last 12 months (Table 2). In addition, 60% of the sample had been tested for HIV in the last 12 months, and 12% had another STD diagnosed in the last 12 months. Compared with MSMO, MSMW were more likely to have had any condomless sex (81% vs. 64%; $P < 0.0001$), had more total sex partners [median 6 (IQR 4–11) vs. 3 (IQR 2–8); $P < 0.0001$], had more total casual sex partners [median 5 (IQR 2–10) vs. 3 (IQR 1–7); $P < 0.0001$], and had more total condomless sex partners [median 2 (IQR 1–4) vs. 1 (IQR 0–2); $P < 0.0001$] in the last 12 months. When comparing only male partners, however, MSMW were less likely to have had condomless anal sex over the last 12 months (50% vs. 64%; $P < 0.0001$) and with their last male partner (34% vs. 40%; $P < 0.0001$) and had fewer condomless anal sex partners [median 0 (IQR 0–2) vs. 1 (IQR 0–2); $P < 0.0001$] over the last 12 months than MSMO. MSMW were more likely to have given (17% vs. 4%; $P < 0.0001$) and received (28% vs. 6%; $P < 0.0001$) money or drugs in exchange for sex, to have engaged in binge drinking (56% vs. 51%; $P < 0.0001$) in the last 12 months, and to have ever injected drugs (14% vs. 6%; $P < 0.0001$). MSMW were also more likely to have been under the influence of drugs (8% vs. 5%; $P < 0.0001$) or both drugs and alcohol (19% vs. 8%; $P < 0.0001$) with their last male sex partner. However, MSMW were less likely than MSMO to have been diagnosed with an STD in the last 12 months (11% vs. 12%; $P = 0.047$).

Adjusted Prevalence Ratios

In adjusted models (Table 3), MSMW compared with MSMO were more likely to both give (aPR 2.85, 95% CI: 2.52 to 3.24) and receive (aPR 2.64, 95% CI: 2.37 to 2.93) money or drugs in exchange for sex in the last 12 months and more likely to have ever injected drugs (aPR 2.05, 95% CI: 1.80 to 2.34). However, MSMW were less likely to report condomless anal sex with male partners (aPR 0.77, 95% CI: 0.74 to 0.81) and less likely to have been diagnosed with another STD in the last 12 months (aPR 0.83, 95% CI: 0.72 to 0.95). We did not detect a significant association between MSMW and HIV testing in the previous 12 months (aPR 0.98, 95% CI: 0.95 to 1.02). After stratifying by race, there was no significant difference in injection drug use between black MSMW and MSMO, but there was for every other racial category. The aPR for injection drug use for MSMW vs. MSMO among black participants (aPR 1.22, 95% CI: 0.92 to 1.63) was less than that of white (aPR 2.42, 95% CI: 2.06 to 2.85), Hispanic/Latino (aPR 2.49, 95% CI: 1.82 to 3.42), and other (aPR 2.31, 95% CI: 1.57 to 3.38) participants (data not shown). We found no other significant differences by race in the associations for other outcomes after stratification.

Risk Behaviors With Last Partner (MSMW)

When comparing behaviors with female and male last sexual partners among MSMW only, we found that MSMW were less likely to have a casual partnership with their last female sex partner than with their last male sex partner (68% vs 73%; $P = 0.0003$) and to receive drugs or money in exchange for sex (5% vs. 13%; $P < 0.0001$) (Table 4). Condomless sex (52% vs. 34%; $P < 0.0001$), alcohol use during sex (52% vs. 46%; $P < 0.0001$), and giving drugs or money in exchange for sex (6% vs. 2%; $P < 0.0001$) were more prevalent with last female partners than last male partners. In addition, participants were more likely to report concurrent partnerships with last female sex partners than last male sex partners (69% vs 22%; $P < 0.0001$). Furthermore, we found that condomless sex with female partners was more prevalent among MSMW in concurrent partnerships with their last female partner than those who were reportedly monogamous (53% vs. 43%; $P = 0.007$).

DISCUSSION

We found that MSM are heterogeneous with respect to HIV risk behaviors. Specifically, more than 10% of MSM also reported sex with women. Importantly, we reported that MSMW were less likely to have condomless anal sex with a male partner but more likely to exchange sex for money or drugs. Our results also support previous studies finding that a greater proportion of MSMW are black[27,28] and of lower income and education.[13,29] MSMW were more likely to have condomless sex, use alcohol before sex, and report concurrent partnerships with a last female sexual partner than with a male one.

Our study strengthens previous arguments that MSMW engage in less condomless anal sex with their male partners than MSMO.[27–30] There is less consensus in the literature regarding risk behaviors with female partners.[29,31] A national cross-sectional study of 3703 men found that MSMW did not use condoms less frequently with their male and female partners than MSMO or heterosexual men.[31] Conversely, our results indicated that when sexual partners of both genders are taken into account, MSMW have more total sex partners, casual sex

partners, and condomless sex partners than MSMO. Also, we found that MSMW are less likely to use condoms with their female partners than with males. This is an important distinction when developing interventions that address HIV risks among this population that is often grouped with other MSM. Focusing solely on their same-sex behavior overlooks risk factors exhibited with their female partners.

The high prevalence of exchange sex among MSMW has been found in other studies.[11–13] MSMW in our study were more than twice as likely as MSMO to have received money or drugs in exchange for sex in the last 12 months and nearly 3 times as likely to have given that compensation for sex in the same period. When examining most recent sex partners, we found that MSMW were more likely to have given money or drugs in exchange for sex with their last female partner but more likely to have received drugs or money for sex with their last male partner. This supports existing literature suggesting that the latter behavior may be for solely economic reasons or to support a drug habit among some men who may otherwise be heterosexual.[32] However, our prevalence ratio for receiving drugs or money for sex among MSMW vs. MSMO was attenuated but robust after adjusting for income and drug use. Future research focused on the MSMW community is needed to determine the drivers of this behavior.

Our study found that testing for HIV within the last 12 months did not differ significantly between MSMO and MSMW, which supports recent literature on these populations.[21] Despite this, we found that among those who tested positive for HIV in this study, MSMW were twice as likely as MSMO to be unaware of their status. This exceeds the disparity found in existing literature on undiagnosed seropositivity among MSMW and is important for its implications on transmission of HIV to the sexual partners of MSMW.[33]

The role concurrency plays in the transmission of STDs and HIV has been debated for decades, and there is still no consensus on the matter.[34–37] However, the extremely high prevalence (69%) of concurrent relationships among this population of MSMW with their female partners cannot be ignored. Concurrent partnerships may facilitate transmission of HIV to female partners of MSMW.[35] Females, a historically low HIV prevalence group, can be exposed in these partnerships to the high HIV prevalence pool of MSM.[2] Furthermore, concurrency increases the odds of exposure of a new HIV infection to multiple sex partners during the acute phase of heightened infectiousness.[33] This is especially relevant given our finding that MSMW used condoms less frequently with their concurrent female partners than with reportedly monogamous female partners. In addition, we found that when accounting for female sex partners, MSMW have more total sex partners, more casual sex partners, and more condomless sex partners than MSMO. MSMW were also more likely to be under the influence of alcohol with their female partners than with males. Unfortunately, these risk behaviors often go unrecognized by the female sex partners of MSMW.[38] These findings support previously published data on the contribution of MSM to HIV infections among women.[25]

Our study has several limitations. Venues selected for sampling required a majority of those in attendance to be MSM. Those who conceal their same-sex behavior may be less likely to frequent the selected venues and therefore may not have been reached. Misclassification is

also a concern because exposure categories were based on self-reported behavior over the year preceding the interview. A participant could have been classified as MSMO for having only male partners in that period, despite having female sex partners 13 or more months prior. This could lead to underestimation of MSMW in our study. The definition of MSMW having both a male and female sex partner over the last 12 months inherently biases those participants as having more sex partners than MSMO. Comparison of these results should be interpreted with caution. Data collected through face-to-face interviews might be subject to social desirability bias. This could distort the results of HIV awareness, as test results were compared with self-reported status. In addition, substance use among the MSMW in our sample in conjunction with sexual activity could lead to disproportionate underreporting of condomless sex or sex partners. MSMW were less likely than MSMO to disclose their same-sex behavior to friends and health care providers, and therefore may have been less forthcoming in the interview when discussing risk behaviors with male partners. Use of pre-exposure prophylaxis was low in 2011 and 2014 and could therefore not be sufficiently examined in this analysis. Future studies of MSMW that examine pre-exposure prophylaxis and its effect on HIV risk behaviors would address an important gap in knowledge.

CONCLUSIONS

Meaningful distinctions were observed when comparing MSMW with MSMO in this analysis in nearly every demographic and sexual risk behavior we examined. Tailored interventions are needed to reduce exchange sex among MSMW. In addition, the findings of this study suggest that MSM may significantly contribute to HIV infections among women, as has been previously suggested. This study presents further evidence that MSMW are a population distinct from MSMO, requiring their own focus in research and interventions to reduce HIV-related health disparities in this frequently marginalized population.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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TABLE 1

Demographic Characteristics for MSMO and MSMW, NHBS, 2011 and 2014

	Total, n (%)	MSMO, n (%)	MSMW, n (%)	Prevalence Difference (95% CI)[*]
Overall	17,207 (100.0)	15,165 (88.1)	2042 (11.9)	—
Median age, yr (IQR)	31 (25–43)	32 (25–43)	30 (24–41)	—[†]
Race/ethnicity				
White	6641 (38.6)	6078 (40.1)	563 (27.6)	−12.5 (−14.6 to −10.4)[†]
Black or African American	4630 (26.9)	3812 (25.1)	818 (40.1)	14.9 (12.7 to 17.2)[†]
Hispanic/Latino[‡]	4578 (26.6)	4077 (26.9)	501 (24.5)	−2.4 (−4.3 to −0.4)[†]
Other[§]	1294 (7.5)	1143 (7.5)	151 (7.4)	−0.1 (−1.4 to 1.1)
Sexual identity				
Homosexual	14,003 (81.6)	13,641 (90.2)	362 (17.9)	−72.3 (−74.1 to −70.6)[†]
Bisexual	2944 (17.2)	1416 (9.4)	1528 (75.4)	66.0 (64.1 to 67.9)[†]
Heterosexual	208 (1.2)	70 (0.5)	138 (6.8)	6.3 (5.2 to 7.4)[†]
Education level				
Less than grade 12	865 (5.0)	579 (3.8)	286 (14.0)	10.2 (8.7 to 11.7)[†]
High school	4006 (23.3)	3347 (22.1)	659 (32.3)	10.2 (8.1 to 12.4)[†]
Some college, technical college	5758 (33.5)	5101 (33.6)	657 (32.2)	−1.5 (−3.6 to 0.7)
Bachelor's or postgraduation studies	6576 (38.2)	6137 (40.5)	439 (21.5)	−19.0 (−20.9 to −17.0)[†]
Annual household income				
0–$19,999	5447 (32.1)	4488 (30.0)	959 (48.0)	18.0 (15.7 to 20.3)[†]
$20,000–$39,999	4212 (24.8)	3751 (25.1)	461 (23.1)	−2.0 (−4.0 to 0.0)[†]
$40,000–$74,999	4062 (24.0)	3727 (24.9)	335 (16.8)	−8.2 (−9.9 to −6.4)[†]
$75,000 or more	3242 (19.1)	2997 (20.0)	245 (12.3)	−7.78 (−9.4 to −6.2)[†]
Region				
Northeast	3601 (20.9)	3173 (20.9)	428 (21.0)	0.0 (−1.8 to 1.9)
South and Territories[‖]	7387 (42.9)	6373 (42.0)	1014 (49.7)	7.6 (5.3 to 9.9)[†]
Midwest	1737 (10.1)	1499 (9.9)	238 (11.7)	1.8 (0.3 to 3.2)[†]
West	4482 (26.1)	4120 (27.2)	362 (17.7)	−9.4 (−11.2 to −7.6)[†]
Current health insurance	12,629 (73.4)	11,388 (75.1)	1241 (60.8)	−14.2 (−16.5 to −12.0)[†]
Self-reported positive HIV status	2505 (15.9)	2333 (16.6)	172 (9.8)	−6.8 (−8.3 to −5.3)[†]
Positive HIV test result	3442 (20.0)	3090 (20.4)	352 (17.2)	−3.1 (−4.9 to −1.4)[†]
Out to anyone (gay- or bi-identified respondents only)	16,092 (95.0)	14,555 (96.7)	1537 (81.4)	−15.3 (−17.1 to −13.5)[†]
Out to health care provider	12,918 (75.2)	11,897 (78.6)	1021 (50.1)	−28.6 (−30.8 to −26.3)[†]

[*] Prevalence differences estimated from beta coefficients from log-linked binomial regression models, unadjusted.

[†] P < 0.05.

[‡] Hispanic/Latinos can be of any race.

§Includes those reporting American Indian or Alaska Native, Asian, Native Hawaiian or Pacific Islander, other race, or multiple races.

‖Includes Puerto Rico.

TABLE 2

Risk Behaviors Among MSMO and MSMW, NHBS, 2011 and 2014

	Total, n (%)	MSMO, n (%)	MSMW, n (%)	Prevalence Difference (95% CI)[*]
Overall	17,207 (100.0)	15,165 (88.1)	2042 (11.9)	
Behaviors in the last 12 mo (unless otherwise noted)				
Median number of male sex partners (IQR)	3 (2–8)	3 (2–8)	3 (2–6)	—[†]
Median number of total sex partners (IQR)	4 (2–9)	3 (2–8)	6 (4–11)	—[†]
Median number of male casual sex partners (IQR)	3 (1–7)	2.5 (1–7)	2 (1–5)	—[†]
Median number of total casual sex partners (IQR)	3 (1–7)	2.5 (1–7)	5 (2–10)	—[†]
Median number of condomless male anal sex partners (IQR)	1 (0–2)	1 (0–2)	0 (0–2)	—[†]
Median number of total condomless sex partners(IQR)	1 (0–2)	1 (0–2)	2 (1–4)	—[†]
Condomless anal sex with male partners	10,661 (62.1)	9646 (63.7)	1015 (49.9)	−13.8 (−16.1 to −11.5)[†]
Condomless anal sex with last male partner	6739 (39.3)	6048 (40.0)	691 (34.0)	−6.0 (−8.2 to −3.8)[†]
Any condomless sex	11,300 (65.8)	9646 (63.7)	1654 (81.2)	−17.5 (−19.4 to −15.7)[†]
Gave money or drugs for sex	1005 (5.8)	666 (4.4)	339 (16.6)	12.3 (10.6 to 13.9)[†]
Received money or drugs for sex	1531 (8.9)	969 (6.4)	562 (27.5)	21.2 (19.2 to 23.2)[†]
Tested for HIV				
Yes	10,288 (59.8)	9037 (59.6)	1.251 (61.3)	1.7 (0.6 to 3.9)
No	4693 (27.3)	4046 (26.7)	647 (31.7)	5.0 (2.0 to 7.1)[†]
No, because HIV positive	2164 (12.6)	2030 (13.4)	134 (6.6)	−6.8 (−8.0 to −5.6)[†]
Diagnosed with other STD	2084 (12.1)	1863 (12.3)	221 (10.8)	−1.5 (−2.9 to 0.0)[†]
Binge drinking, last 30 d	8834 (51.7)	7696 (51.0)	1138 (56.2)	5.1 (2.8 to 7.4)[†]
Ever injected drugs	1206 (7.0)	916 (6.1)	290 (14.3)	8.2 (6.6 to 9.8)[†]
Drug or alcohol use with last male partner				
Alcohol	4875 (28.3)	4328 (28.6)	547 (26.8)	−1.8 (−3.8 to 0.3)
Drugs	886 (5.2)	731 (4.8)	155 (7.6)	2.8 (1.6 to 4.0)[†]
Both drugs and alcohol	1642 (9.6)	1255 (8.3)	387 (19.0)	10.7 (8.9 to 12.4)[†]

Numbers may not add to totals because of missing values.

[*] Prevalence differences estimated from beta coefficients from log-linked binomial regression models, unadjusted.

[†] $P < 0.05$.

TABLE 3

Prevalence Ratios Comparing MSMO and MSMW for Selected Outcome Variables, NHBS, 2011 and 2014

	Unadjusted Prevalence Ratio (95% CI)	aPR (95% CI)
Condomless anal sex with male sex partners, last 12 mo	n = 17,181	n = 16,935
MSMO	Ref	Ref[*]
MSMW	0.78 (0.75 to 0.82)	0.77 (0.74 to 0.81)
Gave money or drugs in exchange for sex, last 12 mo	n = 17,175	n = 16,929
MSMO	Ref	Ref[†]
MSMW	3.79 (3.34 to 4.29)	2.85 (2.52 to 3.24)
Received money or drugs in exchange for sex, last 12 mo	n = 17,174	n = 16,928
MSMO	Ref	Ref[†]
MSMW	4.31 (3.91 to 4.76)	2.64 (2.37 to 2.93)
Diagnosed with another STD, last 12 mo	n = 17,207	n = 16,963
MSMO	Ref	Ref[‡]
MSMW	0.88 (0.77 to 1.01)	0.83 (0.72 to 0.95)
Ever injected drugs	n = 17,202	n = 16,958
MSMO	Ref	Ref[§]
MSMW	2.33 (2.04 to 2.67)	2.05 (1.80 to 2.34)
Tested for HIV, last 12 mo	n = 14,981	n = 14,751
MSMO	Ref	Ref[§]
MSMW	0.95 (0.92 to 0.99)	0.98 (0.95 to 1.02)
Out to health care provider	n = 17,170	n = 16,859
MSMO	Ref	Ref[||]
MSMW	0.64 (0.61 to 0.67)	0.73 (0.69 to 0.77)

Prevalence ratios estimated from log-linked Poisson regression with generalized estimating equations clustered on recruitment event.

[*] Adjusted for age, income, and ever injected drugs.

[†] Adjusted for age, education, income, and ever injected drugs.

[‡] Adjusted for age and income.

[§] Adjusted for age, education, and income.

[||] Adjusted for education, income, sexual identity, and current health insurance.

TABLE 4

Risk Behaviors With Last Partner by Sex of Partners Among MSMW, NHBS, 2011 and 2014

	Total, n (%)	Male Partners, n (%)	Female Partners, n (%)	Prevalence Difference (95% CI)[*]
Overall	4084 (100.0)	2042 (50.0)	2042 (50.0)	—
Last partner casual (vs. main)	2860 (70.1)	1482 (72.7)	1378 (67.6)	−5.2 (−8.0 to −2.4)[†]
Gave money or drugs for sex	158 (3.9)	42 (2.1)	116 (5.7)	3.6 (2.5 to 4.8)[†]
Received money or drugs for sex	367 (9.0)	268 (13.1)	99 (4.9)	−8.3 (−10.0 to −6.5)[†]
Condomless sex	1741 (42.8)	691 (34.0)	1050 (51.6)	17.6 (14.6 to 20.6)[†]
Knowledge of partner's HIV status	1902 (46.6)	982 (48.1)	920 (45.1)	−3.1 (−6.1 to 0.0)[†]
Alcohol use during sex	1991 (48.8)	934 (45.8)	1057 (51.9)	6.1 (3.0 to 9.2)[†]
Drug use during sex	1086 (26.6)	542 (26.6)	544 (26.7)	0.1 (−2.6 to 2.9)
Concurrent partnership				
Yes	1867 (45.7)	453 (22.2)	1414 (69.3)	47.1 (44.4 to 49.8)[†]
No	1410 (34.5)	1148 (56.2)	262 (12.8)	−43.4 (−46.0 to −40.8)[†]
One-night stand	807 (19.8)	441 (21.6)	366 (17.9)	−3.7 (−6.1 to −1.2)[†]

Numbers may not add to totals because of missing values.

[*] Prevalence differences estimated from beta coefficients from log-linked binomial regression models, unadjusted.

[†] $P < 0.05$.