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ABSTRACT

This paper utilizes the National HIV Behavioral Surveillance data in Miami for the men who have sex with men cycle (NHBS-MSM2) in 2008. We analyzed sexual risk, substance use and undiagnosed seropositivity in a diverse sample of men who have sex with men and women (MSMW) and compared them with MSM. Of 152 MSMW, 15.1% tested HIV positive with 73.9% previously undiagnosed. Almost half (44.1%) of the MSMW reported unprotected sex with male and female partners in the past year. More MSMW than MSM had undiagnosed HIV infection, exchanged sex for money or drugs, used crack and cocaine, been high during sex, and had not received HIV treatment if HIV positive. Undiagnosed HIV infection among MSMW was associated with Black race, older age, non-alcohol use and Ecstasy use. Our findings indicate that MSMW represent a unique population at risk of acquiring and transmitting HIV in Miami.

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BACKGROUND

Men who have sex with men and women (MSMW) represent a unique population group who are at risk of HIV acquisition and transmission between populations of men who have sex with men (MSM) and heterosexual men and women (Friedman et al., 2014a; Friedman et al., 2014b; Gorbach et al., 2009; Hightow et al., 2006; Knight et al., 2007; Lauby et al., 2008; Mutchler et al., 2008; Operario et al., 2011; Prabhu et al., 2004; Siegel et al., 2008; Spikes et al., 2009; Wheeler et al., 2008; Williams et al., 2009; Zule et al., 2009). Several studies have suggested that MSMW are less likely than MSM to have ever been tested for HIV (Jeffries, 2010) and are at greater risk of undiagnosed HIV infection than are MSM (Friedman et al., 2014; Maulsby et al., 2012; Satcher et al., 2007; Young et al., 2011). A number of studies have reported that MSMW are reluctant to discuss their bisexual practices with their female partners (Gorbach et al., 2009; McKay et al., 2011; Montgomery et al., 2003; Williams et al., 2009), and are less likely to disclose and more likely to conceal their sexual activities than are MSM or MSW (Dodge et al., 2012; Millett et al., 2005; Prabhu et al., 2004; Satcher et al., 2007; Schrimshaw et al., 2012). Although several studies have assessed the factors associated with undiagnosed HIV infection among MSM, few studies have assessed associations with undiagnosed HIV infection specifically among MSMW.

A number of studies have recognized that Miami-Dade County, Florida, has high rates of HIV seropositivity, HIV risk behaviors, drug use, and undiagnosed HIV infection among MSM (Akin et al., 2008; Centers for Disease Control and Prevention (CDC), 2005; CDC, 2010; Darrow et al., 2005; Fernández et al., 2005; Fernández et al., 2007; Forrest et al., 2010; Friedman et al., 2014; Webster et al., 2003). Local studies also demonstrate high rates of HIV seropositivity among heterosexual males and females (LaLota et al., 2011).

Purpose

In this paper, we aim to add to the limited literature on undiagnosed HIV among MSMW by assessing the associations among sexual risk, substance use behaviors, and undiagnosed HIV infection in a large and diverse sample of MSMW residing in Miami-Dade County, Florida. We also compare the sexual risk and substance use behaviors of MSMW with men who have sex with men only (MSM) and discuss the potential risk of HIV infection and

transmission among MSMW in Miami-Dade County, an area where previous NHBS studies have shown that HIV prevalence is 29.3% among MSM, 8.3% among heterosexual women, and 6.1% among heterosexual men (LaLota et al., 2011).

METHODS

We analyzed cross-sectional data from the National HIV Behavioral Surveillance's second men who have sex with men cycle (NHBS-MSM2) conducted from June through November 2008 in Miami-Dade County, Florida. Venue-based, time-space sampling was used in the NHBS study to recruit men who have sex with men 18 years of age and older who are residents of Miami-Dade County to conduct face-to-face interviews. In addition to the national core NHBS questionnaire used to collect information about behavioral risks for HIV, HIV testing history, and use of HIV-prevention services and programs (Sanchez et al., 2006), staff administered a local questionnaire assessing depression, social support and crystal methamphetamine use. A more detailed description of the NHBS-MSM study and methodology has been previously reported (CDC, 2005; MacKellar et al., 2007; Sanchez et al., 2006). All analyses were conducted on unweighted data.

Participants were classified into two categories based on the reported gender of their sex partners within the past 12 months: MSMW or MSM. Participants categorized as MSMW reported at least one male sex partner (oral or anal sex) and one female sex partner (oral, vaginal or anal sex) within the past 12 months. Participants categorized as MSM reported at least one male (oral or anal sex) but no female sex partners in the past 12 months. All participants, therefore, reported oral or anal sex with at least one male sex partner in the past 12 months to be included in the analysis.

In Table 1 and Table 2, we describe study participants' demographic and psychosocial characteristics (Table 1), sexual risk behaviors and substance use (Table 2), and compare them across MSM and MSMW. In Table 3, we looked at MSMW only and present the association between demographic, psychosocial, and substance use variables and undiagnosed HIV seropositivity. All measures except the results of the HIV testing are self-reported and all sexual risk and drug use measures assess behaviors occurring in the 12 months prior to the date of the interview.

Demographic characteristics included age, race/ethnicity, country of origin, sexual orientation, annual household income, whether a participant reports being homeless in the past 12 months, incarcerated in the past 12 months, having participated in drug treatment in the past 12 months, having been HIV tested in the past 12 months (excluding participants diagnosed HIV positive more than one year ago), and being currently on HIV medication (tables show categorization of each measure).

Depression was assessed using the Center for Epidemiologic Studies Depression Scale (10 items, each with 4 possible values from 0 to 3); the score was dichotomized to denote "depression" (≥10) and "non-depression" (<10) (Andresen et al., 1994).

Social support was assessed using the Multidimensional Scale of Perceived Social Support (12 items, score 1–5, $\alpha = 0.91$) (Zimet et al., 1988). A higher score indicates increased social support.

Sexual risk behavior was assessed using questions based on sexual practices in the past 12 months. The questions included in this category addressed participants' partner type (male, female; main, casual or exchange), type of sex (anal, vaginal or oral; insertive or receptive), and whether the respondent was high on drugs or alcohol during last sex act and condom use. Composite binary variables were created for each sexual risk measure (Table 2).

Discussed HIV status with sex partner before sex was based on the question, "Did you discuss both your HIV status and his/her HIV status before you had sex for the first time?" and was asked for each partner type (male or female; main, casual or exchange). Composite binary variables were created for each partner type presented.

Substance use frequency questions about alcohol and illicit drug use (including prescription drugs used illegally and injection drug use) included crystal methamphetamine, other amphetamines, cocaine, crack, downers (e.g., Valium, Ativan, Xanax), pain killers (e.g., OxyContin, Percocet), hallucinogens (e.g. LSD), club drugs (e.g., Ecstasy [MDMA], GHB, Ketamine), heroin, marijuana and amyl nitrate. Specific questions were asked about heavy alcohol use (e.g., defined as having five or more alcoholic drinks in one sitting at least once a month during the past 12 months) and participation in injection drug use.

Told others about attraction to men or sex with men was based on the question, "Have you ever told anyone that you are attracted to or have sex with men?" For those who answered yes, the participant was asked if he had told the following people: gay, lesbian or bisexual friends; friends who are not gay, lesbian or bisexual; family members; a health care provider.

HIV test results were obtained by use of the OraQuick Advance Rapid HIV Test using a blood sample followed by a confirmatory test using Western

Blot or by use of Western Blot using the OraSure Oral Specimen alone.

Undiagnosed HIV infection refers to those individuals who self-reported an HIV negative or unknown status but tested HIV positive based on their confirmatory test in this study.

Data Analysis

Participants were categorized as being either MSM or MSMW by self-reported description of their sexual behavior in the past 12 months and in Table 1 and Table 2. The chi-square test of independent proportions was used to determine significant differences between the two groups in the proportions of the described characteristics and behaviors. Fisher's exact test was used if any tables had an expected value in a cell of less than five. In Table 3 (undiagnosed HIV positive MSMW), the Fisher's test was also used to determine if there were significantly different proportions of undiagnosed HIV seropositivity in each of the categories of the same characteristics and behaviors as shown in previous tables. In Table 3, we offer the corresponding chi-square value and the Fisher's test p-value. When a stratified analysis was done, the Cochran-Mantel-Haenszel (CMH) statistic was used to test for the association between the outcome variable and the exposure after stratification.

RESULTS

Descriptive Comparisons by MSMW vs. MSM

Of the 527 participants in this study of men who have sex with men, 152 (28.8%) reported also having at least one female sex partner during the past 12 months (Table 1). The majority of MSMW participants were 23 to 39 years old (59.2%), Hispanic (65.1%), had a high school education or less (66.4%), and had an annual household income of less than $20,000 (74.3%). In addition, the MSMW participants were equally US (48.7%) and foreign-born (51.3%). Compared to MSM participants, MSMW participants had a higher percentage Black and lower percentage White (30.3% vs. 12.8%, 3.3% vs. 12.5%, $\chi2$=29.7, p<.001), and had more born in the US and less in Cuba (48.7% vs. 32%, 16.4% vs. 29.6%, $\chi2$=16.3, p=0.003). More MSMW than MSM had a high school education or less (66.4% of MSMW vs. 37.1% of MSM, $\chi2$=46.3, p<.001), were unemployed (37.5% vs. 15.2%, $\chi2$=61.7, p<.001), and had an annual household income of less than $20,000 (74.3% vs. 42.4%, $\chi2$=46.1, p <.001). More MSMW participants had been homeless in the past 12 months (35.5% vs. 4.3%, $\chi2$=91.8, p<0.001), had been incarcerated in the past 12 months (34.2% vs. 9.1%, $\chi2$=50.1, p<.001), and had attended drug treatment in the past 12 months (9.2% vs. 2.7%, $\chi2$=10.7, p<.001), than MSM participants. In addition, compared to MSM participants, MSMW participants were younger in age (32.6 mean vs. 35.4 mean, t=3.0, p=.003). MSMW had higher levels of depression (50.0% vs. 32.0%, $\chi2$=15.0, p<.001); lower levels of perceived social support (2.22 mean vs. 2.71 mean t=4.9, p<.001); and lower levels of having told anyone about being attracted to men or having sex with men (68.5% vs. 97.6%, $\chi2$=94.9, p<.001). Although the MSMW's HIV seroprevalence is lower than that of MSM (15.1% vs.29.3%, $\chi2$=11.6, p<0.001), the rate of undiagnosed HIV infection among MSMW is higher (73.9% vs. 39.1%, $\chi2$=9.3, p=.002). Furthermore, MSMW who self-reported being HIV positive had lower rates of current HAART treatment at the time of the interview than MSM (28.6% vs. 67.2%, $\chi2$=4.1, p=.044) (Table 1).

Sexual Risk and Substance Use Behaviors by MSMW vs. MSM

Compared to MSM, the MSMW reported a higher rate of a number of sexual risk and substance use behaviors (Table 2). MSMW reported higher rates of exchanging sex for money or drugs in the past 12 months (18.4% vs. 3.2%, $\chi2$=35.7, p<.001), unprotected sex (anal or vaginal) with any type of male or female partner (88.2% vs. 66.7%, $\chi2$=24.9, p<.001), and unprotected sex (anal or vaginal) with male or female casual or exchange partners (62.5% vs. 33.9%, $\chi2$=10.4, p<.001). Almost half (44.1%) of MSMW in this sample reported unprotected anal or vaginal sex with at least one male and one female in the past 12 months (Table 2), with an average of nine male partners (mean=8.56, median=3) and six female partners (mean=5.78, median=3) in the past 12 months (data not shown). Out of the 67 MSMW who reported unprotected sex with at least one male and one female (Table 2), four (5.97%) of these men tested HIV positive at the time of the NHBS interview. All four of these men were unaware of their HIV seropositive status (Table 3). In addition, MSMW reported discussing their and their sex partner's HIV status before having sex with only 55.9% of their main male partners, 37.9% of their casual male partners, 47.4% of their main female partners, and 26.1% of their casual female partners in the past 12 months (Table 2).

Undiagnosed HIV Seropositivity among MSMW

Bivariate analysis within the MSMW sample only is presented in Table 3. This table shows the associations of demographics and behavioral variables with undiagnosed HIV seropositivity. We found significantly different proportions of undiagnosed HIV infection among MSMW (rows' percents given) by

race/ethnicity (mainly Blacks 19.5% vs. Hispanics 7.1%, $\chi2=8.6$, $p=.042$), alcohol use in the past 12 months (non-alcohol users 20.4% vs. alcohol users 6.1%, $\chi2=7.1$, $p=.014$), Ecstasy (MDMA) use in the past 12 months (non-Ecstasy users 9.0% vs. Ecstasy users 27.8%, $\chi2=5.7$, $p=.017$), and HIV testing in the past 12 months (not tested for HIV in the past 12 months 18.1% vs. tested for HIV in the past 12 months 5.3%, $\chi2=5.8$, $p=.020$). For other demographic, drug use, and sex risk variables, there was no association with undiagnosed HIV seropositivity among MSMW.

In further multivariate analysis of the associations between undiagnosed HIV infection and Ecstasy use among MSMW (data not shown in table), those who were 18-29 years old and currently used Ecstasy had higher levels of undiagnosed HIV infection than those who did not use (33.3% vs. 6.7%, $\chi2=6.1$, $p=.014$) whereas there was no association in the other age categories (CMH $\chi2=6.7$, $p=0.010$). Within those incarcerated within the past 12 months, those using Ecstasy had higher levels of undiagnosed HIV (57.1% of users vs. 6.7% non-users, $\chi2=13.25$, $p<.001$) and no association in those not incarcerated (CMH $\chi2=5.4$, $p=.020$). Within those who did not test for HIV in the past 12 months, there was a 66.7% level of undiagnosed HIV infection among Ecstasy users vs. a 13.6% level among non-users ($\chi2=10.4$, $p=.001$) and there was no such significant association within those who did test for HIV within the past 12 months (CMH $\chi2=8.0$, $p=.005$).

DISCUSSION

Two main findings emerged from this analysis. First, 15.1% of MSMW participants tested HIV positive, 73.9% of whom were unaware of their HIV infection. Second, the MSMW of our sample represent a group who are uniquely at risk of HIV infection and transmission. High rates of unprotected sex with male or female, casual or exchange partners, sex while high on drugs and/or alcohol with the last male or female partner, and low rates of discussion of HIV status before sex with male and female partners put MSMW at increased risk of HIV infection and transmission from and to their male and female sex partners. To illustrate the potential risk of HIV infection and transmission between MSMW and their male and female sex partners in Miami-Dade County, note that 44.1% (n=67) of the MSMW in our sample had unprotected anal or vaginal sex with at least one male partner and one female partner in the past 12 months (Table 2). Out of the 67 MSMW who reported unprotected sex with both male and female sex partners in the past 12 months (Table 2), 5.97% (n= 4 of 67) tested HIV positive at the time of the NHBS interview and reported being unaware of their HIV seropositive status (Table 3). NHBS data confirms that HIV seroprevalence is high among both MSM and heterosexual males and females locally, with a 29.3% HIV seroprevalence among MSM in Miami-Dade County (Table 2) and a 6.1% HIV seroprevalence among heterosexually active males and an 8.3% HIV seroprevalence among heterosexually active females in high-risk areas in South Florida (LaLota et al., 2011). In addition, several studies have demonstrated that the female partners of MSMW are more likely than other women to engage in risky drug use and sexual risk behaviors and may have social and sexual networks that involve high rates of risky behaviors (Gorbach et al., 2009; Harawa et al., 2013; Voetsch et al., 2010).

Our finding that MSMW who had tested for HIV within the 12 months prior to the interview had lower rates of undiagnosed HIV infection than those who tested before this 12-month period suggests a need for greater HIV testing and communication about HIV testing among MSMW; a need supported by other research that suggests that MSMW are at greater risk of undiagnosed HIV infection than MSM (Maulsby et al., 2012; Satcher et al., 2007; Young et al., 2011). The finding that only 37.9% of MSMW discussed their and their partner's HIV status before having sex for the first time with a male casual partner and that only 26.1% of MSMW discussed HIV status before having sex with a female casual partner (Table 2) would seem to increase the risk of acquiring and transmitting HIV between local MSMW and their male and female sex partners.

Our finding that MSMW were more likely than MSM to be depressed and have lower perceived social support, and less likely to have told others about their attraction to men or having sex with men, indicates a lack of access to mental health services and social support among local MSMW. Several studies in Miami-Dade County have shown that MSMW experience high levels of psychological distress including depression, anxiety, traumatic stress (Díaz et al., 2001; Kurtz, 2008), and suicidal ideation (Díaz et al., 2001) and are also four times more likely than MSM or MSW to experience intimate partner violence (IPV) victimization and perpetration (Gonzalez-Guarda et al., 2013). In addition, MSMW may experience biphobia, characterized by the stigma and discrimination that bisexual individuals experience from both their interactions with heterosexual and homosexual individuals on the basis of their bisexual orientation and/or identity (Dodge et al., 2012; Friedman et al., 2014a; Friedman et al., 2014b). As such, biphobia presents a unique source of psychological stress for MSMW that might explain

bisexual men's increased risk for mental health problems (Dodge et al., 2012; Friedman et al., 2014a; Friedman et al., 2014b), possibly underlying MSMW's sexual risk behaviors.

Although the use of Ecstasy by MSMW in South Florida has been documented (Friedman et al., 2014a), our finding of the associations between undiagnosed HIV infection and Ecstasy use among MSMW during analysis was unexpected. Specifically, we found that Ecstasy users who are 18-29 years old, Ecstasy users who have been incarcerated in the past 12 months, and Ecstasy users who did not test for HIV within the past 12 months, had significantly higher levels of undiagnosed HIV infection than those who did not use Ecstasy. These findings suggest further research into the connections between the use of Ecstasy and undiagnosed HIV infection levels among MSMW.

Several study limitations should be recognized. These data are from a sample of men recruited from public venues in Miami-Dade County, Florida, and are not necessarily representative of MSMW or MSM in this county or other areas. These data are self-reported and, as such, stigmatized behaviors may have been underreported. The analysis was cross sectional, so time order could not be established.

Implications for Public Health Practice

Our findings indicate that MSMW represent a uniquely susceptible population at risk of HIV infection and transmission in Miami-Dade County, Florida. These findings raise additional concerns because of the high rate of undiagnosed HIV infection and low use of HIV treatment among this population. Our findings suggest a need for efforts to increase HIV testing and treatment among MSMW; efforts that take into consideration the considerable stigma and discrimination surrounding both HIV infection and gay or bisexual sexual orientation often experienced by members of this group. Our findings also suggest possibilities for future research on factors such as partner characteristics, sexual networks and the role of substance use affecting undiagnosed HIV infection among MSMW.

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Table 1. Demographic and Psychosocial Characteristics of MSM and MSMW in NHBS-MSM2, 2008 (N=527)

Characteristics	MSM n (%) n=375*	MSMW n (%) n=152*	$\chi 2$, p-value
Age			11.59, .021
18-22	57 (15.2)	24 (15.8)	
23-29	70 (18.7)	45 (29.6)	
30-39	106 (28.3)	45 (29.6)	
40-49	105 (28.0)	30 (19.7)	
50+	37 (9.9)	8 (5.3)	
Race/ethnicity			29.68, <.001
Non-Hispanic black	48 (12.8)	46 (30.3)	
Non-Hispanic white	47 (12.5)	5 (3.3)	
Hispanic	269 (71.7)	99 (65.1)	
Other	11 (2.9)	2 (1.3)	
Country of origin			16.34, .003
United States	120 (32.0)	74 (48.7)	
Mexico	6 (1.6)	2 (1.3)	
Puerto Rico	16 (4.3)	8 (5.3)	
Cuba	111 (29.6)	25 (16.4)	
Other	122 (32.5)	43 (28.3)	

Education			46.29, <.001
< HS grad	41 (10.9)	37 (24.3)	
HS grad or GED	98 (26.1)	64 (42.1)	
Some college, assoc or technical school	119 (31.7)	38 (25.0)	
College grad	105 (28.0)	12 (7.9)	
Post grad	12 (3.2)	1 (0.7)	
Employment			61.71, <.001
Employed full-time	238 (63.5)	49 (32.2)	
Employed part-time	41 (10.9)	38 (25.0)	
Unemployed	57 (15.2)	57 (37.5)	
Other	39 (10.4)	8 (5.3)	
Sexual Identity			289.10, <.001
Heterosexual or straight	0 (0.0)	16 (10.7)	
Homosexual or gay	325 (86.7)	13 (8.7)	
Bisexual	50 (13.3)	120 (80.5)	
Income (household)			46.07, <.001
0 to $19,999	158 (42.4)	113 (74.3)	
$20,000 to $39,999	124 (33.2)	22 (14.5)	
$40,000 to $74,999	62 (16.6)	15 (9.9)	
$75,000 or more	29 (7.8)	2 (1.3)	
Homeless in past 12 months			91.76, <.001
No	359 (95.7)	98 (64.5)	
Yes	16 (4.3)	54 (35.5)	
Incarcerated in past 12 months			50.07, <.001
No	341(90.9)	100(65.8)	
Yes	34(9.1)	52(34.2)	
Attended drug treatment in past 12 months			
No	365 (97.3)	138 (90.8)	10.66, <.001
Yes	10 (2.7)	14 (9.2)	
Depression (CES-D 10)			15.00, <.001
No	255 (68.0)	76 (50.0)	
Yes	120 (32.0)	76 (50.0)	
Social support			23.62, <.001
LT 3.34	60 (16.0)	47 (30.9)	
LT 3.33 – GT 4.08	96 (25.6)	43 (28.3)	
4.079 – <4.67	113 (30.1)	43 (28.3)	
GT 4.67	106 (28.3)	19 (12.5)	
Told others about attraction to men or sex with men			
Told anyone	366 (97.6)	102 (68.5)	94.89, <.001
Told gay, lesbian or bisexual friends	365 (97.3)	80 (53.7)	158.63, <.001
Told friends who are not gay, lesbian or bisexual	333 (88.8)	64 (42.9)	122.06, <.001
Told family members	312 (83.2)	49 (32.9)	125.96, <.001
Told health care provider	278 (74.5)	39 (26.4)	103.24, <.001

HIV test in past 12 months (excluding positives >12 months ago, MSM n=315, MSMW n=147)			4.05, .044
No	192 (60.9)	75 (51.0)	
Yes	123 (39.0)	72 (49.0)	
HIV test result			11.56, 0.001
NEGATIVE	265 (70.7)	129 (84.9)	
POSITIVE	110 (29.3)	23 (15.1)	
Undiagnosed HIV infection (of those tested HIV positive)			9.32, .002
No	67 (60.9)	6 (26.1)	
Yes	43 (39.1)	17 (73.9)	
Currently on HIV medication (of self-reported HIV positive)			4.07, .044
No	22 (32.8)	5 (71.4)	
Yes	45 (67.2)	2 (28.6)	

%: Column %
*n for some variables may not add to total due to missing data

Table 2. Behavioral Characteristics of MSM and MSMW in NHBS-MSM2, 2008 (N=527)

Characteristics	MSM n (%) n=375*	MSMW n (%) n=152*	$\chi 2$, p-value
Ever injected drugs			13.88, <.001
No	366 (97.6)	137 (90.1)	
Yes	9 (2.4)	15 (9.9)	
Heavy alcohol use in past 12 months**			21.61, <.001
No	217 (57.9)	54 (35.5)	
Yes	158 (42.1)	98 (64.5)	
Used marijuana in past 12 months			19.12, <.001
No	278 (74.1)	83 (54.6)	
Yes	97 (25.9)	69 (45.4)	
Used powdered cocaine in past 12 months			22.23,< .001
No	301 (80.3)	92 (60.5)	
Yes	74 (19.7)	60 (39.5)	
Used crack cocaine in past 12 months			50.56,< .001
No	359 (95.7)	114 (75.0)	
Yes	16 (4.3)	38 (25.0)	
Used Ecstasy in past 12 months			0.94, .333
No	341 (90.9)	134 (88.2)	
Yes	34 (9.1)	18 (11.8)	
High on drugs and/or alcohol during last sex with male partner			23.61, <.001
No	251 (66.9)	67 (44.1)	
Yes	124 (33.1)	85 (55.9)	

High on drugs and/or alcohol during last sex with female partner			
No	n.a.	63 (41.4)	n.a.
Yes	n.a.	89 (58.6)	
Exchanged sex for money or drugs (male or female)			35.73,< .001
No	363 (96.0)	124 (81.6)	
Yes	12 (3.2)	28 (18.4)	
Unprotected sex in past 12 months (male or female)			24.94,< .001
No	141 (37.6)	18 (11.8)	
Yes	234 (62.4)	134 (88.2)	
Unprotected sex with casual or exchange partners (male or female)			10.44,< .001
No	248 (66.1)	57 (37.5)	
Yes	127 (33.9)	95 (62.5)	
Unprotected sex with male AND female partners in the past 12 months			n.a.
No	n.a.	85 (55.9)	
Yes	n.a.	67 (44.1)	
Discussed HIV status before sex with male main partner			2.56, .110
No	32 (29.4)	15 (44.1)	
Yes	77 (70.6)	19 (55.9)	
Discussed HIV status before sex with male casual partner			3.58, .058
No	142 (51.6)	72 (62.1)	
Yes	133 (48.4)	44 (37.9)	
Discussed HIV status before sex with female main partner			n.a.
No	n.a.	20 (52.6)	
Yes	n.a.	18 (47.4)	
Discussed HIV status before sex with female casual partner			n.a.
No	n.a.	82 (73.9)	
Yes	n.a.	29 (26.1)	

%: Column%
*n for some variables may not add to total due to missing data
**5 or more alcoholic drinks in one sitting at least once a month during the past 12 months

Table 3. Undiagnosed HIV Seropositive MSMW by Selected Characteristics in NHBS-MSM2, 2008

Characteristics	HIV+ Undiagnosed n (%) n=17*	$\chi 2$, Fisher's p-value
Age		3.31, .442
18-22	1 (4.2)	
23-29	6 (13.3)	
30-39	4 (8.9)	
40-49	4 (13.3)	
50+	2 (25.0)	

Race/ethnicity		8.60, .042
Non-Hispanic Black	9 (19.6)	
Non-Hispanic White	0 (0.0)	
Hispanic	7 (7.1)	
Other	1 (50.0)	
Sexual identity		0.63, .775
Heterosexual or straight	1 (6.3)	
Homosexual or gay	2 (15.4)	
Bisexual	13 (10.8)	
Homeless in past 12 months		0.27, .601
No	10 (10.2)	
Yes	7 (13.0)	
Incarcerated in past 12 months		0.41, .590
No	10 (10.0)	
Yes	7 (13.5)	
Ever injected drugs		0.34, 1.00
No	16 (11.7)	
Yes	1 (6.7)	
Attended drug treatment in past 12 months		4.69, .053
No	13 (9.4)	
Yes	4 (28.6)	
Depression (CES-D)		1.66, .303
No	11 (14.5)	
Yes	6 (7.9)	
Used alcohol in past 12 months		7.12, .014
No	11 (20.4)	
Yes	6 (6.1)	
Used Ecstasy in past 12 months		5.66, .017
No	12 (9.0)	
Yes	5 (27.8)	
HIV test in past 12 months		5.81, .020
No	13 (18.1)	
Yes	4 (5.3)	
Number of male sex partners in past 12 months		1.40, .281
1-4	9 (9.0)	
5+	8 (15.4)	
Number of female sex partners in past 12 months		0.11, 1.00
1-4	12 (11.8)	
5+	5 (10.0)	
Exchanged sex for money or drugs (male or female)		1.32, .322
No	12 (9.8)	
Yes	5 (17.2)	

Unprotected sex in past 12 months (male or female)		0.00, 1.00
No	2 (11.1)	
Yes	15 (11.2)	
Unprotected sex with casual or exchange partners (male or female)		0.00, 1.00
No	10 (11.2)	
Yes	7 (11.1)	
Unprotected sex with male AND female partners in the past 12 months		3.28, .118
No	13 (15.3)	
Yes	4 (6.0)	
High on drugs and/or alcohol during last sex with male partner		0.07, .801
No	8 (11.9)	
Yes	9 (10.6)	
High on drugs and/or alcohol during last sex with female partner		0.30, .795
No	6 (9.5)	
Yes	11 (12.4)	

%: Row %.
*n for some variables may not add to total due to missing data

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