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Behavioral and Clinical Characteristics of Self-Identified Bisexual Men Living with HIV Receiving Medical Care in the United States—Medical Monitoring Project, 2009–2013

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Abstract

Nationally representative data comparing demographic, risk, and clinical information among bisexual men with other MSM or heterosexuals are lacking. We described differences in demographic characteristics, behaviors, and clinical outcomes among self-identified HIV-positive bisexual, gay, and heterosexual men receiving HIV medical care in the United States. We analyzed data from the 2009–2013 cycles of the Medical Monitoring Project (MMP), a surveillance system that provides nationally representative estimates of behavioral and clinical characteristics of adults with diagnosed HIV in medical care. Altogether, 10% (95% confidence interval [CI] 9–11) of men self-identified as bisexual, 56% (CI 51–61) as gay, and 32% (CI 28–37) as heterosexual. We observed significant differences in demographic factors, clinical outcomes, drug use, and sexual behavior among bisexual men compared with gay and heterosexual men. Providers should consider sexual identities as well as sexual behaviors when developing and implementing prevention programs.

Keywords

Bisexual men; HIV; HIV transmission risk behaviors; gay men; heterosexual men

Background

Gay, bisexual and other men who have sex with men (MSM) represent the majority of new HIV diagnoses in the United States; in 2016, gay and bisexual men accounted for 67% of all new HIV infections and 83% of new HIV infections among men (CDC, 2015). MSM are a heterogeneous group with regards to sexual identity, sexual preference, and sexual behaviors. The term MSM first appeared in publications in 1992 (Lifson, 1992) and was introduced to connote that these men's risk was based on behaviors rather than sexual

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identity or orientation. The ongoing use of the term MSM has been criticized within the gay and public health communities, with many feeling it muddles social meanings (Young & Meyer, 2005) and does not capture the nuanced identities, behaviors, lives, and well-being of men (Truong, Perez-Brumer, Burton, Gipson, & Hickson, 2016). Sexual identities and practices are also known to change over time (Truong et al., 2016). Understanding how bisexual identity relates to sexual behavior could help to identify men at risk for transmitting HIV and inform health-related programs and interventions designed to reduce this risk.

Bisexually identified men have been under-represented in studies of the broader group of MSM, with few studies examining their behavioral characteristics, HIV transmission risk behaviors, and prevention needs. These studies have often been limited by small sample sizes, have focused on selected populations of men (e.g., Latino MSM, HIV-negative men), or use non-representative convenience samples, often in limited geographic areas, thus limiting generalizability (Agronick et al., 2004; Brennan-Ing, Porter, Seidel, & Karpiak, 2014; Crosby, Mena, Geter, & Hickson, 2015). Sexual risk behaviors have sometimes been found to differ between gay and bisexual men, but findings have been mixed (Agronick et al., 2004; Bowers, Branson, Fletcher, & Reback, 2011; Brennan-Ing et al., 2014; Chetwynd, Chambers, & Hughes, 1992; Flores, Bakeman, Millett, & Peterson, 2009; Maulsby, Sifakis, German, Flynn, & Holtgrave, 2013; Stokes, Vanable, & McKirnan, 1997; Weatherburn, Hickson, Reid, Davies, & Crosier, 1998; Williams, Mackesy-Amiti, McKirnan, & Ouellet, 2009). Studies of substance use (Lehavot, Blosnich, Glass, & Williams, 2017; McCabe, West, Hughes, & Boyd, 2013; Prestage, Hammoud, Lea, Jin, & Maher, 2017) also provide mixed results while data on clinical outcomes among bisexually identified men are lacking. Nationally representative data based on sexual identity are needed to understand ongoing risk behaviors and clinical outcomes in bisexual men living with HIV in the United States.

Limited studies have examined mental health (Jorm, Korten, Rodgers, Jacomb, & Christensen, 2002; Ross, Dobinson, & Eady, 2010; Sandfort, Bakker, Schellevis, & Vanwesenbeeck, 2006), physical health (Cochran & Mays, 2007; Sandfort et al., 2006), and healthcare use (Tjepkema, 2008) among bisexual people. Ross et al. found that bisexuality is often dismissed at a structural level and that bisexually identified persons had the legitimacy of their sexual identities questioned. Cochran et al. found minority sexual orientation was associated with some elevation in risk for common health conditions and health limitations. Significant differences in mental health were also associated with bisexual orientation when compared to heterosexual or homosexual orientation (Jorm et al., 2002). Importantly, these studies all concluded that homosexually and bisexually identified men should be considered as separate groups in health-related studies.

To fill this gap, we compared sociodemographics, clinical factors, drug use, and sexual behaviors of self-identified bisexual men with gay and heterosexual men, using data from a nationally representative sample of adults receiving HIV medical care.

Methods

Study design and weighting

We analyzed data from the 2009–2013 cycles of the Medical Monitoring Project (MMP), an HIV surveillance system designed to produce annual, nationally representative estimates of behavioral and clinical characteristics of adults with diagnosed HIV receiving outpatient HIV medical care in the United States. Data were collected via in-person and telephone interviews and medical record abstractions during June 2009-May 2014. MMP methods, including weighting procedures and response rates, have been described in detail elsewhere (CDC, 2014; Iachan et al., 2016). Briefly, during the 2009–2013 cycles, MMP utilized a three-stage, probability-proportional-to-size sampling design in which states and territories were first sampled, followed by facilities providing outpatient HIV medical care in those jurisdictions, then adults with diagnosed HIV. Eligible persons had diagnosed HIV, were aged 18 years or older, and had received outpatient medical care in participating facilities between January and April of the cycle year for which they were sampled. All sampled states and territories participated in every cycle. The facility response rate ranged from 76% to 85% and the patient response rate ranged from 49% to 55%. Data were weighted on the basis of known probabilities of selection at state or territory, facility, and patient levels (Harding, Iachan, Johnson, Kyle, & Skarbinski, 2013) and then weighted to adjust for nonresponse (Heeringa, West, & Berglund, 2010; Särndal & Lundström, 2005).

In accordance with guidelines for defining public health research (CDC, 2010), CDC determined MMP was public health surveillance used for disease control, program, or policy purposes. Local institutional review board approval was obtained at participating states, territory, and facilities when required. Informed consent was obtained from all the interviewed participants.

Participants and measures

Of the 23,125 participants who completed both an interview and a linked medical record abstraction, 16,280 were men who had HIV diagnosed for at least 12 months before interview and were included in the analysis, as behaviors have been shown to change upon learning of one’s diagnosis (Eaton & Kalichman, 2009). Sexual identity was based on self-report and included 1) homosexual, gay or lesbian (henceforth known as gay), 2) heterosexual or straight, and 3) bisexual. All measures reflect self-reported behaviors or experiences in the 12 months before the interview unless otherwise noted.

Demographic characteristics (e.g., age, race/ethnicity, education, poverty status, healthcare coverage, homelessness, incarceration, and time since HIV diagnosis) and behaviors (e.g., number of sex partners, sexual behaviors and condom use, self-reported sexually transmitted infection [STI] testing, and alcohol or any drug use before sex) in the 12 months before the interview were obtained from interviews. Poverty was calculated as a dichotomous variable indicating whether the respondent’s household income was below or above the poverty level (using the DHHS Poverty Guidelines). Any drug use before sex was defined as the use of any injectable or non-injectable drug use before sex. The eight-item Patient Health Questionnaire was used to identify depression (APA, 2000). The ninth question in

the DSM-IV assesses suicidal or self-injurious ideation and was omitted because not all interviewers were trained as mental health providers. Research indicates that the deletion of this question has only a minor effect on scoring because active thoughts of self-harm are uncommon in the general population (Kroenke, Spitzer, & Williams, 2001) and in primary care settings (Corson, Gerrity, & Dobscha, 2004; Razykov, Ziegelstein, Whooley, & Thombs, 2012). The PHQ-8 has been shown to be comparable to the PHQ-9 (Kroenke, Spitzer, Williams, & Lowe, 2010; Wells, Horton, LeardMann, Jacobson, & Boyko, 2013), which includes all nine DSM-IV criteria for depressive disorders and has demonstrated good psychometric properties in detecting major depression in non-psychiatric care settings. Participants were considered to have current major depression if, for "more than half the days" in the preceding two weeks, they met at least five of eight criteria.

Viral suppression (HIV viral load <200 copies/mL) at most recent test, prescription of antiretroviral medications (ART), and HIV staging data based on HIV viral load or a diagnosis of an AIDS-defining opportunistic infection were abstracted from medical records. ART dose adherence, defined as the prevalence of self-reported 100% adherence to ART doses in the past 3 days, was obtained from interviews.

Men were separately asked about sexual behavior with female and male partners and were classified as sexually active if they reported any oral, vaginal or anal sex in the 12 months prior to interview. Condomless vaginal or anal sex was defined as not using a condom for part or all of the time during sex. Discordant vaginal or anal sex was defined as having condomless vaginal or anal sex with a partner of negative or unknown HIV status. Participants were asked if they had disclosed their HIV status to none, some, or all of their sexual partners, male sexual partners, and female sexual partners before first sex with that partner; those who responded "some" or "all" were considered to have disclosed their HIV status to each group of partners. Men who reported having sex with a male partner in the 12 months prior to interview were asked whether they disclosed to different groups of persons (e.g., friends, family members, doctors) that they had ever had sex with men. We restricted analyses on sexual behavior and disclosure of HIV status with sexual partners among sexually active persons.

Data analysis

We estimated weighted proportions and 95% confidence intervals (95% CIs) for sociodemographic factors, clinical outcomes, history of drug use, sexual risk behaviors, and disclosure of HIV status to sex partners, and assessed significant differences between bisexual men and homosexual men, and between bisexual men and heterosexual men. We used Rao–Scott chi-square tests (Lohr, 2009; Rao & Scott, 1981) to assess differences in categorical variables and t-tests to assess differences in continuous variables (Fagerland, 2012) by sexual identity; $P < .05$ signified statistical significance. To account for the large numbers of statistical tests and to mitigate against the chances of a type I error, Bonferroni correction was used to establish a table-wise alpha of 0.05 for each table. An estimate was considered unstable if its coefficient of variation (CV), measured as the standard error of the survey estimate divided by the estimate itself, was greater than 0.30 (National Center of Health Statistics, 2007). These estimates were suppressed. All analyses accounted for the

complex sample design and unequal selection probabilities by using the survey procedures in SAS version 9.3 (SAS Institute, Cary NC).

Results

Sociodemographic characteristics

Altogether, 10% of men self-identified as bisexual, 56% as gay, and 32% as heterosexual (data not shown in table). Among the 1618 men who identified as bisexual, approximately 75% were 40 years or older; among the 9018 men who identified as gay, approximately 75% were 40 years or older; among the 5394 men who identified as heterosexual, approximately 86% were 40 years or older (Table 1). Bisexual men were more likely to identify as non-Hispanic blacks (44% vs. 21%), have less than high school education (15% vs. 7%), and only have public insurance (56% vs. 41%) compared with gay men. Bisexual men were significantly more likely to have household incomes at or below the poverty level (38% vs. 24%), to have experienced homelessness (11% vs. 5%), and to report being incarcerated for >24 hr in the past 12 months (8% vs. 3%) than gay men. The prevalence of white race (29% vs. 18%), higher educational attainment (59% vs. 32%), and having private insurance (21% vs. 14%) were higher in bisexual men than in heterosexual men. Bisexual men were significantly less likely to have incomes below the poverty level (38% vs. 60%) compared with heterosexual men.

Clinical factors

Most bisexual, gay, and heterosexual men had an AIDS diagnosis (71%, 64%, 78%, respectively), but AIDS diagnoses were higher in bisexual men compared with gay men, but lower compared with heterosexual men. In addition, most were virally suppressed at the most recent test (76%, 80%, 75%, respectively) and were prescribed ART (92%, 93%, 94%, respectively) (Table 2). Bisexual men were significantly less likely to report being dose adherent to their antiretroviral medications (86% vs. 89%) and to have documentation of viral suppression at most recent test (76% vs. 80%) compared with gay men.

Most bisexual men received some prevention discussion on ways to protect themselves or their partners from getting HIV or other STIs (61%). Among bisexual men, the prevalence of a 1:1 discussion with a health-care worker (45%) was higher than the prevalence of a discussion with a counselor (31%) or group (15%). Bisexual men were more likely to report having any prevention discussion on ways to protect themselves or their partners from getting HIV or other STIs (61% vs. 53%) compared with gay men. Bisexual men were significantly more likely to have symptoms consistent with major depression (12% vs. 8%) compared with heterosexual men.

Drug use

Binge drinking was reported by 16% of bisexual men, 18% of gay men, and 16% of heterosexual men (Table 3). Almost a third of bisexual men (31%), a third of gay men (33%), and nearly a quarter of heterosexual men (24%) reported using any drugs in the past 12 months. Reported drug use differed between bisexual men and heterosexual men; these differences were primarily driven by non-injection drug use. Few bisexual men (3%), gay

men (3%), or heterosexual men (2%) reported injection drug use. Among sexually active men, bisexual men were significantly more likely to drink alcohol (43% vs. 32%) or use non-injection drugs before or during sex (23% vs. 13%) compared with heterosexual men, but there were no differences compared with gay men (Table 4).

Sexual behavior

Overall, 62% of bisexual men, 73% of gay men, and 56% of heterosexual men reported oral, anal, or vaginal sex with one or more partners in the past 12 months (data not shown). Among sexually active men, approximately 15% of bisexual men, 0.1% of gay men, and 98% of heterosexual men reported sex with women only; 62% of bisexual men, 99% of gay men, and 2% of heterosexual men reported sex with men only; 24% of bisexual men, 0.5% of gay men, and 0.5% of heterosexual men reported sex with both men and women (data not shown). Table 4 presents sexual risk behaviors among sexually active men. Compared with sexually active gay men, sexually active bisexual men had significantly fewer total sexual partners (4.2 vs. 6.1), were less likely to report any condomless sex (37% vs. 47%), any male-male condomless sex (43% vs. 56%) and any male-male discordant condomless sex (12% vs. 18%). Compared with sexually active heterosexual men, sexually active bisexual men were significantly more likely to report any condomless sex (37% vs. 24%) and discordant condomless sex with female partners (19% vs. 13%). Among those tested, 34% of bisexual men reported an STI diagnosis and were significantly more likely to report being diagnosed with an STI (34% vs. 18%) compared with heterosexual men.

Disclosure of same-sex attraction and HIV status

Sexually active bisexual men were significantly less likely to disclose their HIV status to both male and female sex partners (66%) than sexually active gay (72%) and heterosexual (78%) men (Table 5). Among sexually active men with male partners, bisexual men were significantly less likely to disclose their HIV status to male partners (64%) than gay men (72%). Among sexually active men with female partners, bisexual men were significantly less likely to disclose their HIV status to female partners (64%) than heterosexual men (78%). Compared with sexually active gay men, sexually active bisexual men were significantly less likely to tell their friends, families, spouse/partner, health-care workers, and female partners that they had sex with men.

Discussion

To our knowledge, this analysis provides the first population-based comparison of sociodemographics, clinical factors, drug use, and sexual behaviors among HIV-positive men receiving medical care, by self-reported sexual orientation. We found that an estimated 10% of the men in our sample self-identified as bisexual men. There were significant differences among bisexual men by race, education, poverty status, and healthcare coverage compared with gay or heterosexual men. Bisexual men were less likely to be ART dose adherent and virally suppressed compared with gay men. Sexual risk behaviors such as number of partners, condomless anal or vaginal sex, and discordant sex were significantly different in bisexual men compared with gay or heterosexual men. Lastly, bisexual men were

significantly less likely to disclose their same-sex attraction or HIV status compared with gay men.

The use of probability sampling provides a more representative picture of the characteristics of bisexual men living with HIV and how they differ from other men compared to studies with less robust sampling methods. Previous studies of bisexual men have often used non-population-based sampling techniques, such as respondent-driven sampling and venue-based sampling (Agronick et al., 2004). In addition, many have focused only on selected populations of bisexual men such as racial and ethnic minorities (Lauby et al., 2008; Wold et al., 1998) or youth (Shearer, Khosropour, Stephenson, & Sullivan, 2012; Wheeler, Lauby, Liu, Van Sluytman, & Murrill, 2008), or have sampled primarily low-income men (Hightow et al., 2006; Valleroy et al., 2000). Because all of the men in MMP had the same assessment tool and were enrolled from a diverse geographic area, these findings allowed us to explore specific behaviors without having to accommodate for potential biases arising from datasets from different populations of men or from different measurement or data collection techniques. In addition, a recent comparison of MMP to the National HIV/AIDS Surveillance system found the MMP population has similar demographics characteristics with all HIV-diagnosed persons (Buchacz et al., 2015).

Our findings highlight the complexities of examining sexual behavior vs. sexual identity. We found that heterosexually identified men still reported having a mean of two male sex partners and gay-identified men reported having a mean of one female sex partners. Classifying men living with HIV based solely on sexual behaviors has been shown to lead to misclassification (Brennan-Ing et al., 2014). We found a range of patterns of sexual partnerships among bisexually identified men, with 24% reporting sex with both men and women in the past 12 months. There may be benefits to designing HIV prevention strategies that incorporate the needs of self-identified bisexual men, because strategies based only on behaviors may not reach bisexually identified men, who may be distanced from the gay community (Pathela et al., 2006). Operario et al. showed that prevention interventions that assume congruity between self-reported sexual identity and sexual behavior may not reach men who identify as bisexual (Operario, Smith, Arnold, & Kegeles, 2011). Bisexually identifying men may therefore be excluded from effective health promotion interventions targeting gay-identified men, both in terms of access and in terms of the relevance of messages (McAloney-Kocaman et al., 2016). Further, we found that some gay-identified men reported sex with women and some heterosexually identified men reported sex with men. Our results support the assertion of others that prevention campaigns aimed at men, regardless of their sexual identity, may be most effective when they assume that some men will have sex with men and women and address preventing transmission to both their male and their female partners (Montgomery, Mokotoff, Gentry, & Blair, 2003).

Although bisexual men have levels of viral suppression similar to heterosexual men, bisexual men were less likely to be virally suppressed than gay men. A contributing factor may be adherence to ART, which was lower in bisexual men compared with other men. These findings, taken in combination with our finding of some discordant condomless sex with male and female partners, suggest there may be a need to develop interventions tailored to bisexually identified men (Operario et al., 2011) that address the benefits of ART and

adherence in reducing the risk of sexual transmission of HIV. To our knowledge, there are none.

We found differences in sexual behaviors that carry a risk of HIV transmission by sexual identity. In general, bisexual men reported less risky behaviors than gay men but more risky behaviors than heterosexual men. A prior study comparing behaviorally bisexual men to behaviorally gay men showed mixed results (Hightow et al., 2006). We found that bisexual men were significantly more likely to report condomless and discordant sex with their female partners compared to heterosexual men, supporting other research (Goodenow, Netherland, & Szalacha, 2002; Stokes et al., 1997). In addition, we found that even though bisexual men had fewer female partners than heterosexual men, they were less likely to use condoms with their female partners than heterosexual men. Reporting fewer female partners may be a risk reduction strategy for these men. Risk-reduction strategies targeted for bisexually identified men that stress condom use with both male and female partners are needed.

While the majority of all three sexually active groups of men in our population disclosed their HIV status, sexually active bisexual men were less likely to disclose their HIV status to all sexual partners before first sexual contact compared to sexually active gay and heterosexual men. Wheeler and colleagues showed that, in general, black bisexual men were less likely to disclose same-sex behavior with their other sexual partners compared with black gay men (Wheeler et al., 2008). Murphy and colleagues found that HIV-negative men expect men living with HIV to disclose their status (Murphy, de Wit, Donohoe, & Adam, 2015), but our findings suggest this may not always occur, with just over half of sexually active men reporting disclosure to male partners. A systematic review of HIV disclosure interventions (Conserve, Groves, & Maman, 2015) found that only a small number of studies have evaluated an intervention aiming to increase HIV disclosure to sexual partners. Among the efficacious interventions, methods included facilitator-led group interventions, website-based interventions, and video-based interventions. These studies were mainly among MSM, with only one focusing on gay and bisexual men. Risk-reduction interventions that include discussions on HIV disclosure focusing on sexual identity may be needed among all men.

Limitations

This analysis is subject to several limitations. First, MMP data reflect the experiences of adults with diagnosed HIV receiving medical care in the United States, and these results cannot be generalized to persons unaware of their HIV infection or to those not receiving medical care. Sexual and drug use behaviors are likely to differ among persons in care and not in care (Marks, Crepaz, & Janssen, 2006). However, the MMP population have similar demographics characteristics with all HIV-diagnosed persons (Buchacz et al., 2015). Second, our measure of sexual risk behavior lacks refinement. Men who had just one instance of condomless sex in the past 12 months were grouped together with men who may have had multiple encounters of condomless sex, which would carry a greater likelihood of HIV transmission. Third, given less than optimal response rates in these study years, measurement error due to nonresponse bias is possible. However, our estimates were

weighted based on the characteristics of nonresponders to minimize nonresponse bias. In addition, empirical research indicates that low response rates are not necessarily indicative of nonresponse bias, particularly when probabilistic samples are drawn from rigorously constructed frames (Groves & Peytcheva, 2008), as was the case for MMP. Fifth, these data are cross-sectional, so observed associations should not be inferred as evidence of causality. Sixth, sexual and drug use behavior data were collected during face-to-face or telephone interview, so social desirability and recall bias may have led to underreporting of some behaviors (Schroder, Carey, & Vanable, 2003). Seventh, Ferlatte et. al. (Ferlatte, Hottes, Trussler, & Marchand, 2017) reported that participants in national population surveys may under-report sexual minority identities which may have led to misclassification.

Conclusions

Self-identified bisexual men have unique sociodemographic, sex, and drug risk behaviors, and their clinical outcomes are poorer than those of gay men. Our findings expand the limited information of behaviors and outcomes of self-identified bisexual men and may be used to guide effective, comprehensive HIV prevention strategies for self-identified bisexual men. Our findings may be used to inform the development and implementation of effective preventive services and programs tailored for bisexual men. This may include studies in the area of sexual risk reduction and ART adherence to 1) identify the types of services and programs that would best address the particular needs of self-identified bisexual men living with HIV, 2) implement and evaluate programs that most effectively and efficiently reduce risk and promote health among this group, and 3) identify implementation strategies for increasing the reach and scalability of effective interventions. Our results are a first step in filling these gaps by providing population level descriptive information, laying a foundation for future studies and identifying directions for future work.

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Table 1.

Sociodemographic characteristics of self-identified bisexual, gay and heterosexual men with diagnosed HIV in HIV medical care, United States – MMP 2009–2013 (N = 16,280).

	Bisexual Men (n = 1618)		Gay Men (n = 9018)		Bisexual Men compared with Gay Men	Heterosexual Men N = (5394)		Bisexual Men compared with Heterosexual Men
Characteristic	**n**	**Weighted % (95% CI)**	**n**	**Weighted % (95% CI)**	**p-value[a]**	**n**	**Weighted % (95% CI)**	**p-value[a]**
Race/Ethnicity								
White	463	29.4 (24.2–34.6)	4858	55.5 (51.6–59.6)	<.0001	890	17.8 (14.3–21.3)	<.0001
Black/African American	714	44.1 (37.9–50.4)	1883	20.7 (17.2–24.3)		2916	55.3 (48.6–61.8)	
Hispanic/Latino[b]	351	20.4 (17.1–23.8)	1797	18.4 (16.1–20.7)		1395	22.9 (16.9–28.9)	
Multiracial/Other	90	6.0 (4.9–7.5)	480	5.2 (4.6–5.8)		193	4.1 (3.1–4.9)	
Age (years)								
18–29	147	9.0 (7.1–11.0)	747	8.5 (7.5–9.6)	0.3	207	4.0 (3.3–4.8)	<.0001
30–39	251	15.8 (13.7–17.9)	1479	16.7 (15.8–17.6)		533	10.2 (9.2–11.2)	
40–49	545	33.9 (31.5–36.5)	3255	36.1 (34.9–37.2)		1752	32.0 (30.4–33.6)	
50+	675	41.2 (38.3–44.0)	3537	38.7 (37.2–40.3)		2902	53.8 (52.1–55.5)	
Education								
<High School	240	14.6 (12.7–16.4)	661	7.2 (6.5–7.9)	<.0001	1882	33.9 (31.6–36.2)	<.0001
High School or GED	438	26.8 (24.3–29.3)	1814	19.9 (18.6–21.3)		1840	34.1 (32.4–35.9)	
>High School	940	58.6 (55.6–61.6)	6451	72.9 (71.1–74.6)		1668	31.9 (29.4–34.5)	
At or below poverty threshold [c]	617	38.3 (35.4–41.2)	2191	24.2 (22.3–26.1)	<.0001	3167	59.9 (57.5–62.2)	<.0001
Health care coverage								
Any private	282	20.9 (18.3–23.5)	2830	38.1 (35.4–40.7)	<.0001	642	14.3 (12.3–16.4)	<.0001
Public only	785	55.6 (51.9–59.3)	3394	41.4 (38.9–43.9)		3230	66.3 (63.4–69.1)	
Uninsured or RW only[d]	320	23.4 (19.5–27.4)	1529	20.5 (17.7–23.3)		855	19.4 (16.7–22.1)	
Homelessness past 12 months [e]	186	10.9 (8.9–12.9)	480	5.1 (4.6–5.7)	<.0001	645	12.3 (10.9–13.6)	0.3
Ever incarcerated > 24 hours	119	7.6 (6.1–9.2)	241	2.7 (2.3–3.0)	<.0001	460	8.9 (7.9–9.9)	0.2

To account for the large numbers of statistical tests and to mitigate against the chances of a type I error, Bonferroni correction was used to establish a table-wise alpha of 0.05 for this table: the critical value for determining significance in this table is 0.004

[a] Rao-Scott chi Square *p*-value

[b] Respondents were classified as Hispanics or Latinos regardless of their racial category. Participants are classified in only one race/ethnicity category

[c] Poverty guidelines as defined by the Department of Health and Human Services (HHS); the 2008 guidelines were used for participants interviewed in 2009, the 2009 guidelines were used for participants interviewed in 2010, the 2010 guidelines were used for participants interviewed in 2011, the 2011 guidelines were used for participants interviewed in 2012, the 2012 guidelines were used for participants interviewed in 2013, and the 2013 guidelines were used for participants interviewed in 2014. More information regarding the HHS poverty guidelines can be found at http://aspe.hhs.gov/poverty/faq.cfm.

[d] No other health insurance or coverage besides Ryan White

[e] Living on the street, in a shelter, in a single-room-occupancy hotel, or in a car

Table 2.

Clinical outcomes in 12 months prior to interview of self-identified bisexual, gay and heterosexual men with diagnosed HIV in HIV medical care, United States – MMP 2009–2013 (N = 16,280).

	Bisexual Men (n = 1618)		Gay Men (n = 9018)		Bisexual Men compared with Gay Men	Heterosexual Men N = (5394)		Bisexual Men compared with Heterosexual Men
Characteristic	**n**	**Weighted % (95% CI)**	**n**	**Weighted % (95% CI)**	**p-value[a]**	**n**	**Weighted % (95% CI)**	**p-value[a]**
Time since HIV diagnosis								
<5 years	376	24.2 (21.3–26.9)	1736	20.7 (19.5–21.2)	0.004	994	19.2 (17.9–20.6)	0.001
5–9 years	346	20.8 (18.8–22.8)	1772	19.7 (18.7–20.7)		1214	22.3 (21.1–23.4)	
≥10 years	896	55.0 (52.3–57.8)	5510	59.6 (57.9–61.3)		3186	58.5 (56.6–60.4)	
Most advanced stage of disease (ever)								
Stage 1[b]	82	4.9 (3.7–5.9)	739	8.4 (7.6–9.2)		229	4.4 (3.8–5.1)	<.0001
Stage 2[c]	392	24.7 (22.5–26.9)	2443	27.5 (26.4–28.7)		939	17.7 (16.4–18.9)	
Stage 3 (AIDS)[d]	1140	70.5 (68.2–72.7)	5799	64.0 (62.8–65.3)	<.0001	4217	77.9 (76.3–79.4)	
Most recent VL suppressed [e]	1228	76.1 (73.8–78.5)	7253	79.9 (78.9–81.1)	0.0007	4079	75.4 (73.7–77.0)	0.6
Prescribed ART	1479	91.7 (90.2–93.1)	8319	93.1 (92.4–93.8)	0.08	5064	93.6 (93.1–95.2)	0.0005
Dose Adherent	1236	86 (84–88)	7355	89 (88–90)	0.002	4276	87.7 (86.4–88.9)	0.007
Major Depression [f]	190	12 (10–14)	908	10 (9–11)	0.03	441	7.5 (6.9–8.1)	<.0001
Any prevention discussion	717	60.8 (56.9–64.6)	3291	53.0 (49.6–56.5)	0.0001	2583	64.7 (61.9–67.6)	0.01
One on one prevention discussion with healthcare worker[g]	433	45 (40–50)	1976	38 (35–41)	<.0001	1530	49 (45–52)	0.06
One on one prevention discussion with counselor[g]	506	31 (28–34)	2142	23 (21–25)	<.0001	1953	36 (33–39)	0.0004
Group prevention discussion[g]	146	15 (12–18)	615	12 (10–13)	0.01	516	16 (13–18)	0.7

To account for the large numbers of statistical tests and to mitigate against the chances of a type I error, Bonferroni correction was used to establish a table-wise alpha of 0.05 for this table: the critical value for determining significance in this table is 0.003

AIDS: Acquired Immune Deficiency Syndrome; VL: Viral Load; ART: Antiretroviral Therapy

[a] Rao-Scott chi Square *p*-value

[b] HIV infection, stage 1: No AIDS-defining condition and either CD4 count of ≥500 cells/μL or CD4 percentage of total lymphocytes of ≥29%

[c] HIV infection, stage 2: No AIDS-defining condition and either CD4 count of 200–499 cells/μL or CD4 percentage of total lymphocytes of 14–28%

[d] HIV infection, stage 3: (AIDS): Documentation of an AIDS-defining condition or either CD4 count of <200 cells/μL or CD4 percentage of total lymphocytes of <14%. Documentation of an AIDS-defining condition supersedes a CD4 count or percentage that would not, by itself, be the basis for a stage 3 (AIDS) classification

[e] Most recent VL suppressed: Most recent VL < 200 copies/mL

[f] PHQ8 scale; Indicator of major depression based on Kroenke et al.'s (2001) algorithm

[g] Categories not mutually exclusive

Table 3.

Alcohol and drug use behaviors during 12 months before interview among self-identified bisexual, gay and heterosexual men with diagnosed HIV in medical care, United States – MMP 2009–2013 (N = 16,280).

	Bisexual Men (n = 1618)		Gay Men (n = 9018)		Bisexual Men compared to Gay Men	Heterosexual Men N = (5394)		Bisexual Men compared to Heterosexual Men
Characteristic	**n**	**Weighted % (95% CI)**	**n**	**Weighted % (95% CI)**	**p-value[a]**	**n**	**Weighted % (95% CI)**	**p-value[a]**
Binge drinking (past 30 days)	273	16.2 (14.3–18.1)	1672	18.2 (17.4–19.1)	0.06	854	15.6 (14.4–16.7)	0.5
Any drug use	498	30.6 (27.7–33.4)	2986	32.8 (31.2–34.4)	0.1	1238	23.7 (22.2–25.1)	<.0001
Use of any non-injection drugs[b]	482	29.6 (26.9–32.4)	2939	32.3 (30.8–33.9)	0.05	1192	22.9 (21.4–24.5)	<.0001
Use of any injection drugs	50	2.6 (2.2–3.6)	281	2.9 (2.2–3.6)	0.3	133	2.2 (1.4–2.9)	0.3

To account for the large numbers of statistical tests and to mitigate against the chances of a type I error, Bonferroni correction was used to establish a table-wise alpha of 0.05 for this table: the critical value for determining significance in this table is 0.006

[a] Rao-Scott chi Square *p*-value

[b] Includes all drugs that were not injected (i.e. administered by any route other than injection), including legal drugs that were not used for medical purposes

Table 4.

Sexual risk behaviors in 12 months prior to interview among sexually active self-identified bisexual, gay and heterosexual men with diagnosed HIV in medical care, United States – MMP 2009–2013 (N = 10,638).

	Bisexual Men (n = 1006)		Gay Men (n = 6550)		Bisexual Men compared to Gay Men	Heterosexual Men N = (3082)		Bisexual Men compared to Heterosexual Men
Characteristic	**Mean**	**95% CI for Mean**	**Mean**	**95% CI for Mean**	**p-value[a]**	**Mean**	**95% CI for Mean**	**p-value[a]**
Continuous variables								
Mean number total partners	4.2	3.5–4.9	6.1	5.5–6.7	<.0001	1.7	1.5–1.8	<.0001
Mean number of male partners[b]	4.2	3.3–5.0	6.1	5.5–6.7	<.0001	2.3	1.8–2.8	<.0001
Mean number female partners	1.7	1.5–2.0	1.2	1.1–1.4	<.0001	1.7	1.5–1.8	0.8
Categorical variables	n	Weighted % (95% CI)	n	Weighted % (95% CI)	p-value[c]	n	Weighted % (95% CI)	p-value[c]
Condomless anal or vaginal sex	352	37.4 (33.9–40.9)	2916	46.8 (44.4–49.2)	<.0001	733	23.8 (21.9–25.6)	<.0001
Condomless discordant anal or vaginal sex[d]	159	17.0 (14.6–19.4)	1145	18.2 (16.9–19.5)	0.8	437	14.3 (12.7–15.9)	0.05
Any male/male anal sex[e]	689	83.3 (80.4–86.2)	5381	84.0 (82.9–85.2)	0.6	57	80.4 (70.4–90.5)	0.6
Any male/male condomless anal sex[e]	278	43.1 (38.4–47.8)	2910	56.1 (53.4–58.8)	<.0001	23	41.3 (27.9–54.8)	0.06
Any male/male condomless discordant anal sex[e]	96	12.4 (10.2–14.7)	1140	18.2 (16.9–19.5)	<.0001	–	–	–
Any male/female vaginal sex[f]	361	92.1 (89.1–95.1)	64	85.2 (77.2–93.2)	0.06	2888	96.3 (95.6–97.1)	0.0008
Any male/female condomless vaginal sex[f]	99	25.6 (20.2–30.9)	15	20.7 (10.8–30.5)	0.4	698	22.8 (20.9–24.6)	0.3
Any male/female condomless discordant vaginal sex[f]	74	19.1 (14.6–23.6)	–	–	–	410	13.5 (11.9–15.0)	0.008
Exchange sex[g]	52	4.7 (3.2–6.2)	200	3.0 (2.6–3.4)	0.06	149	4.9(4.1–5.7)	0.8
Alcohol use before or during sex	433	43.3 (40.3–46.2)	2863	44.2 (42.7–45.7)	0.3	948	31.8 (29.7–33.9)	<.0001
Use of any non-injection drugs before or during sex	242	23.4 (20.7–26.1)	1629	24.3 (22.7–25.9)	0.4	393	13.3 (11.5–15.1)	<.0001
Use of any injection drugs before or during sex	38	3.4 (1.9–4.8)	219	3.1 (2.2—3.9)	0.2	47	1.4 (0.8–2.0)	0.0003
Diagnosed with STI[h]	106	34.4 (28.7–40.2)	775	34.6 (31.9–37.3)	0.9	138	18.0 (14.4–21.7)	<.0001

To account for the large numbers of statistical tests and to mitigate against the chances of a type I error, Bonferroni correction was used to establish a table-wise alpha of 0.05 for this table: the critical value for determining significance in this table is 0.002

[a] t-test *p*-value

[b] Among heterosexual men with male partners (n = 72)

[c] Rao-Scott chi Square *p*-value

[d] Condomless discordant sex = condomless sex with a negative or unknown HIV status partner

[e] Among men with male partners (bisexual men = 852; gay men = 6532, heterosexual men = 72)

[f] Among men with female partners (bisexual men = 394, gay men = 77, heterosexual men = 3026)

[g] Exchange sex = sex in exchange for things like money, drugs, food, shelter or transportation

[h] Among those tested for any sexually transmitted infection (bisexual men = 320, gay men = 2261, heterosexual men = 735)

–Estimate does not meet standard for statistical reliability

Table 5.

Disclosure of HIV Status before first sex and same-sex attraction in the 12 months prior to interview among sexually active men with diagnosed HIV in medical care, United States – MMP 2009–2013 (N = 10,638).

	Bisexual Men (n = 1006)		Gay Men (n = 6550)		Bisexual Men compared to Gay Men	Heterosexual Men N = (3082)		Bisexual Men compared to Heterosexual Men
Characteristic	**n**	**Weighted % (95% CI)**	**n**	**Weighted % (95% CI)**	**p-value[a]**	**n**	**Weighted % (95% CI)**	**p-value[a]**
Discussed HIV status before first sex								
Discuss HIV status before first sex with all partners	637	66.3 (62.8–69.7)	4556	71.6 (69.9–73.2)	0.004	2351	77.7 (75.8–79.6)	<.0001
Discuss HIV status before first sex with male partners[b]	514	63.7 (59.9–67.5)	4541	71.6 (69.9–73.1)	0.0001	41	58.7 (46.5–70.9)	0.4
Discuss HIV status before first sex with female partners[c]	246	64.4 (59.6–69.2)	40	58.5 (46.0–70.9)	0.4	2316	77.9 (76.1–79.8)	0.0001
Disclosure of same sex attraction								
Told any gay, lesbian or bisexual friends	671	79.5 (76.2–82.9)	5948	92.7 (91.8–93.7)	<.0001	58	83.9 (74.4–93.6)	0.4
Told any friends who are not gay, lesbian or bisexual	536	64.5 (60.1–68.3)	5321	83.1 (81.6–84.6)	<.0001	47	67.4 (53.7–81.1)	0.7
Told any family members	517	63.3 (59.3–67.3)	5146	80.3 (78.7–81.9)	<.0001	46	66.7 (55.7–77.8)	0.5
Told spouse or partner	493	63.1 (59.0–67.1)	4500	77.6 (75.2–79.9)	<.0001	38	58.2 (44.9–71.5)	0.5
Told doctors, nurses, or other healthcare workers	708	85.1 (82.4–87.8)	5940	92.3 (91.4–93.2)	<.0001	58	82.9 (73.7–92.1)	0.6
Told female sex partners[d]	142	59.6 (52.9–66.2)	41	77.6 (65.9–89.2)	0.01	9	65.1 (41.6–88.6)	0.7

To account for the large numbers of statistical tests and to mitigate against the chances of a type I error, Bonferroni correction was used to establish a table-wise alpha of 0.05 for this table: the critical value for determining significance in this table is 0.003

[a] Rao-Scott chi Square *p*-value

[b] Among men with male partners (Bisexual men = 852, Gay men = 6532, Heterosexual men = 72)

[c] Among men with female partners (Bisexual men = 394, Gay men = 77, Heterosexual men = 3026)

[d] Among men with male and female sex partners (Bisexual men = 240, Gay men = 59, Heterosexual men = 16)