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Factors Associated With Recent Human Immunodeficiency Virus Testing Among Men Who Have Sex With Men in Puerto Rico, National Human Immunodeficiency Virus Behavioral Surveillance System, 2011

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Abstract

Background—Annual human immunodeficiency virus (HIV) testing is considered a key strategy for HIV prevention for men who have sex with men (MSM). In Puerto Rico, HIV research has primarily focused on injection drug use, yet male-to-male sexual transmission has been increasing in recent years.

Methods—Cross-sectional data from the National HIV Behavioral Surveillance system collected in 2011 in San Juan, Puerto Rico, were analyzed to identify factors associated with HIV testing in the past 12 months (recent testing).

Results—Overall, 50% of participants were tested recently. In the multivariate analysis, testing recently was associated with having multiple partners in the past 12 months (adjusted prevalence ratio [aPR] [4 vs 1 partner] = 1.5; 95% confidence interval [95% CI], 1.2–2.0), visiting a health care provider in the past 12 months (aPR, 1.4; 95% CI, 1.04–1.8), and disclosing male-male attraction/sex to a health care provider (aPR < 1.4; 95% CI, 1.1–1.7).

Conclusions—Human immunodeficiency virus testing was suboptimal among MSM in San Juan. Strategies to increase HIV testing among MSM may include promoting HIV testing for all sexually active MSM including those with fewer partners, increasing utilization of the healthcare system, and improving patient-provider communication.

Globally, gay, bisexual, and other men who have sex with men (collectively referred to as MSM) are disproportionately affected by the human immunodeficiency virus (HIV).¹ In the United States, nearly 50,000 new HIV diagnoses occur each year, of which 62% are associated with male-to-male sexual transmission.² The HIV epidemic among MSM in the

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US mainland is well described, but less is known about the epidemic in US-dependent areas such as Puerto Rico.

In Puerto Rico, over 13,000 people are currently living with HIV and more than 600 are diagnosed annually with the virus.² Human immunodeficiency virus–related research in Puerto Rico has mainly focused on injection drug use (IDU), which was the primary mode of transmission for over a third of persons living with HIV in the country in 2011.² However, male-to-male sexual transmission in Puerto Rico has increased in recent years, with approximately 45% of new HIV diagnoses among males occurring in MSM in 2011.² HIV prevalence among MSM in Puerto Rico is currently estimated at 9%.³

The Centers for Disease Control and Prevention’s (CDC) National HIV Behavioral Surveillance (NHBS) collects data every 3 years on MSM in 20 US metropolitan statistical areas (MSAs) with high AIDS burden including San Juan-Caguas-Guaynabo, Puerto Rico, and monitors demographic characteristics, sex- and drug-related risk behaviors, as well as use of prevention services, such as HIV testing in the past 12 months (recent testing). The 20 MSAs represented approximately 65% of all persons living with AIDS in urban areas with a population of at least 500,000 in 2011.⁴ The San Juan MSA was eligible to participate in NHBS because the jurisdiction was identified as having one of the highest estimated prevalences of persons living with AIDS.⁵ The San Juan MSA includes roughly two thirds of the total population of Puerto Rico and geographically covers half of the island.^{6–8} In 2005, NHBS data on MSM in San Juan showed that 79% reported recent HIV testing.⁵ In 2008, recent HIV testing was only reported by 52% of the sample, suggesting a decrease in testing.⁹ Furthermore, HIV testing did not improve in San Juan in 2011, though testing rates had generally increased across the other NHBS study sites.^{4,9} Increases in HIV testing mainly occurred in cities funded by CDC’s Expanded Testing Initiative and San Juan was not one of the funded sites.^{10,11} In addition, among HIV-positive MSM, awareness of HIV-positive status improved from 2008 to 2011 for nearly all MSAs except San Juan, where awareness did not change from 2008 (28%) to 2011 (23%, $P = 0.59$).³ San Juan also had the lowest percentage of HIV-positive MSM aware of their HIV infection in 2011.³ These health disparities emphasize the need for additional research to identify gaps in current HIV testing practices for MSM in San Juan. This study sought to identify factors associated with HIV testing in the past 12 months among MSM NHBS participants in San Juan in an effort to characterize MSM who are and are not testing as recommended.

MATERIALS AND METHODS

Study Design

This analysis used cross-sectional data from the 2011 cycle of NHBS conducted among MSM (the current survey) in the MSA of San Juan-Caguas-Guaynabo, Puerto Rico. National HIV Behavioral Surveillance participants were recruited using venue-based sampling which has been previously described.^{9,12} Participants were eligible if they had not participated previously in the current survey; were at least 18 years of age, reported being born male, self-identified as male (transgender individuals were ineligible to participate), ever had oral or anal sex with a male, were residents of the San Juan-Caguas-Guaynabo, Puerto Rico MSA, and were able to complete the interview in English or Spanish. Trained interviewers

using handheld computers administered the interview. Anonymous HIV testing was offered to all participants regardless of self-reported HIV status. National HIV Behavioral Surveillance activities were determined to be research in which CDC staff was not directly engaged, and therefore did not require review by the CDC institutional review board. Activities for the current survey were approved by the institutional review boards at the Puerto Rico Department of Health and the University of Puerto Rico.

Outcome Measure and Associated Factors

The main outcome variable of having received an HIV test in the past 12 months was dichotomized as a yes/no variable. Other variables included in this analysis were associated with HIV testing in the literature and consisted of key demographics, recent health care utilization, ever having told a health care provider about attraction to or sex with men, and sex- and substance use-related risk behaviors. Non-injection drug use included past 12-month use of crystal meth, crack cocaine, powdered cocaine, downers, painkillers, hallucinogens, ecstasy, heroin, poppers, gamma-hydroxybutyrate (GHB), and/or ketamine.

Analysis

To align with the current HIV testing guidelines for MSM who are sexually active, we excluded from the analysis men who did not report having at least 1 male anal or oral sex partner in the past 12 months. We further excluded men who self-reported being HIV-positive and men who did not answer the HIV testing questions.

We assessed associations between independent variables and HIV testing in the past 12 months using a generalized estimating equations (GEE) approach using Poisson regression with robust variance estimators to calculate the unadjusted and adjusted prevalence ratios (aPR) and their 95% confidence intervals (CI).¹³ Data were not weighted to account for the sampling design because final validated sampling weights were not available. Score tests were used to determine statistical significance. Variables that showed significance at the 0.10 alpha level in the bivariate GEE models were included in the initial multivariate GEE model. Age, education, and health insurance type were also considered in the initial multivariate model, based on literature supporting their association with HIV testing. Relevant 2-way interaction terms between these independent variables were included in the initial model. Multicollinearity was assessed and when it occurred, one variable was removed for each collinear pair. For selection of the final model, backward elimination was performed with the remaining variables. After including only significant variables in the model, we then assessed the change-in-estimates of the significant variables and goodness-of-fit (quasi-likelihood information criterion) by adding nonsignificant terms back into the model. Statistical significance in the multivariate analysis was determined using an alpha level of 0.05. Analyses were conducted using SAS 9.3 software (SAS Institute, Cary, NC).

Prevention Services Subanalysis

Given that our focus was on highlighting missed opportunities for HIV testing, and HIV prevention services often include testing, we did not include variables related to receipt of prevention interventions as predictors of HIV testing in the multivariate model. Instead, variables representing the use of prevention services were considered in a bivariate

subanalysis to further investigate their possible relationship with recent HIV testing and identify potential gaps between having received prevention services and having tested for HIV in the past 12 months. Variables related to HIV prevention included having been tested for syphilis, having received free condoms, and/or having received an individual or group-related HIV prevention intervention in the past 12 months. Bivariate GEE was applied to determine the associations between prevention variables and receiving an HIV test in the past 12 months.

RESULTS

Overall, 770 men were approached and 628 of these men agreed to determine their eligibility to participate in the NHBS study. Of these, 417 were determined eligible to participate. In total, 395 men who were eligible also consented to the interview and had valid survey responses. We further excluded men who did not report having at least 1 sexual partner in the past 12 months ($n = 32$) as well as men who self-reported being HIV-positive ($n = 8$) and those who did not answer the HIV testing questions ($n = 3$). The final analytical sample included 352 men.

Most participants were between the ages of 18–24 years (31%), had a college education or higher (46%), earned an annual income of US \$19,999 or less (52%), were employed either part- (16%) or full-time (58%), self-identified as homosexual (86%), and had some form of health insurance coverage (78%) (Table 1). In total, half of the participants (50%) had an HIV test in the past 12 months and 82% had ever received an HIV test. Seven percent (7%, $n = 22$) of participants who reported negative or unknown HIV status had a positive HIV test result. Of those who self-reported negative/unknown status but tested positive, less than half (45%, $n = 10$) had been tested for HIV in the past 12 months.

Over a quarter (28%) of participants reported having anal or oral sex with four or more male partners in the past 12 months, yet more than a third (36%) reported having only one male sex partner during this time. While 17% of participants reported using non-injection drugs in the past 12 months, no IDU was reported. Nearly three-quarters (72%) of participants visited a health care provider in the past 12 months. Although over 90% of the sample had ever told someone that they were attracted to or had sex with men, only 49% had ever disclosed male-male attraction/sex to a health care provider.

Bivariate Results

In bivariate analyses (Table 2), having received a recent HIV test was significantly associated with having had multiple male sexual partners in the past 12 months (unadjusted prevalence ratio, PR [4 vs 1], 1.6; 95% CI, 1.2–2.1), having visited a health care provider in the past 12 months (PR, 1.5; 95% CI, 1.1–2.0), having told a health care provider that they are attracted to or have sex with men (PR, 1.5; 95% CI, 1.2–1.8), and having used non-injection drugs in the past 12 months (PR, 1.3; 95% CI, 1.04–1.7). Of those who had 4 or more partners, 61% were recently tested for HIV compared to 38% of those with only 1 partner in the past year. Of those who recently visited a health provider, 55% received a recent HIV test compared to 36% of those who had not recently visited a provider. Fifty-nine percent of men who had disclosed their orientation to a health care provider received a

recent HIV test compared to 40% of men who had not disclosed. Sixty-two percent of those who used non-injection drugs in the past 12 months had been recently tested for HIV, whereas 47% of those who did not use non-injection drugs had been recently tested. Age, education, type of health insurance, condomless anal sex, and having been diagnosed with an STI were not associated with HIV testing in the bivariate analysis.

Multivariate Results

In the final multivariate model (Table 3), recent HIV testing was associated with having multiple male sex partners in the past 12 months (adjusted (a)PR [4 vs 1 partner], 1.5; 95% CI, 1.2–2.0), having visited a health provider in the past 12 months (aPR, 1.4; 95% CI, 1.04–1.8), and having disclosed male-male attraction/sex to a health provider (aPR, 1.4; 95% CI, 1.1–1.7). Three interaction terms were removed during the collinearity assessment; the remaining interaction terms were not significant and were therefore removed from the model. Age, education, health insurance type, and non-injection drug use were not found to be significantly associated with the outcome during the backward elimination approach. Adding these back into the model did not change the point estimates of the 3 significant variables and did not improve model fit. Therefore, a more parsimonious model that dropped the nonsignificant terms was selected as the final model.

Prevention Services Subanalysis

Approximately one fourth of MSM participants (27%) received individual or group prevention, two thirds (68%) received free condoms, and 28% had been tested for syphilis in the past 12 months (Table 4). In bivariate analyses, HIV testing in the past 12 months was associated with having been tested for syphilis, having received free condoms, and having participated in a group or individual HIV prevention intervention in the past 12 months ($P < 0.01$ for each association). However, not all men who received prevention services reported recent HIV testing. Only 80% of men who tested for syphilis, 56% of men who received free condoms, and 72% of men who participated in either an individual or group-level prevention program in the past year also reported HIV testing in the past year.

DISCUSSION

Despite recommendations calling for at least annual HIV testing of MSM, we found that that only 50% of our MSM participants in NHBS in San Juan had been tested in the past 12 months.¹⁴ Recent HIV testing was associated with having a greater number of partners, having visited a health care provider in the past year, and having disclosed male-male attraction/sex to a health care provider. Therefore, men who are not testing annually and would benefit from testing initiatives include those who have fewer partners, have not visited a health provider in the past year, and have not disclosed male-male attraction/sex to a health provider.

The number of sexual partners predicts HIV risk and is an important criterion for HIV-risk assessment and screening.^{15,16} Though the majority of men in our sample who had multiple sex partners received a recent HIV test, still 39% of those with four or more sexual partners did not recently test. In addition to suboptimal testing among those with multiple partners,

we found that men who reported having one male sexual partner in the past year were significantly less likely to have received a recent HIV test. A growing body of literature suggests that many MSM may be contracting HIV through main partnerships.^{17,18} In the United States, 68% of HIV transmissions among MSM are estimated to occur within main partnerships and this is attributed to a higher number of sex acts, more frequent receptive anal sex, and lower condom use.¹⁷ Men who have one main partner may perceive themselves to be at low risk for HIV and not seek HIV testing. This may be especially true among Hispanics/Latinos for whom low perceived HIV risk has been associated with low testing rates and lack of intention to test in the future.¹⁹ If a high percentage of HIV transmissions is occurring between main partners in Puerto Rico as observed elsewhere among MSM, it is of great concern that this group was also the least likely to recently test. This finding may warrant consideration of couples-based testing initiatives in Puerto Rico to increase testing for these men.²⁰ Additionally, future research should aim to better clarify the relationships between partner type, testing and knowledge of HIV status, and sexual risk behaviors for MSM in Puerto Rico.

An important factor for increasing HIV testing is access to and engagement in routine health care. The association we found between recent testing and visiting a health provider in the past year may indicate that MSM who do not regularly seek health care, such as annual check-ups with a provider, also miss opportunities to be offered an HIV test. Though we cannot conclude whether those who did test for HIV in the past year were tested during a regular health visit, our results are consistent with a similar association between annual health visits and recent HIV testing observed among Hispanic/Latino MSM in the US mainland.²¹ Our findings support current HIV testing policies that recommend integration of HIV testing in primary health care settings and suggest that increasing the utilization of health care in general could help to improve recent HIV testing for MSM in Puerto Rico.^{14,22} Encouraging regular physician visits and removing obstacles to accessing health care may be a feasible method to increase recent testing.

Our analysis also shows that having told a health care provider about being attracted to or having sex with men was significantly associated with receiving a recent HIV test. Yet, less than half of participants reported disclosing this information to their health provider. Disclosure of male-male sex to health providers has been associated with being offered an HIV test, emphasizing that physicians should actively inquire about same-sex practices to increase the offering of HIV tests to MSM.²³ Hispanic MSM are significantly less likely to disclose same-sex attraction to health providers than white men, and disclosure has been associated with annual HIV testing among Hispanic MSM.^{21,24} Our results also suggest that disclosure of male-male attraction/sex during patient-provider conversations presents a key opportunity for providers to initiate HIV testing. Human immunodeficiency virus-related stigma has been documented in the health sector in Puerto Rico which may negatively affect disclosure and the offering of HIV testing in clinical settings.^{25,26} Future research and prevention efforts that explore patient-provider interactions and barriers to disclosing male-male attraction/sex for MSM in Puerto Rico may be warranted. Likewise, interventions that encourage MSM to discuss their sexual history with physicians and/or train physicians to sensitively discuss sexual health with MSM may be effective in increasing HIV testing. Curricula on cultural competency for health providers working with MSM have been

developed by the Fenway Institute and the Desmond Tutu HIV Foundation and could be tailored to the Hispanic/Latino context.^{27,28}

Several prevention services we explored were also significantly associated with recent HIV testing, likely indicating overlap of these services. However, large percentages of those who received prevention services in the past year had not received a recent HIV test. Additionally, our result that men diagnosed with an STI in the past year were not more likely to have been HIV tested may further represent a missed opportunity to link STI and HIV services.²⁹ These findings suggest that health systems in Puerto Rico reaching MSM may still need to strengthen the inclusion of HIV testing within existing prevention and STI testing services as part of a comprehensive approach to sexual health.³⁰

This study is subject to several limitations. First, participants were recruited using venue-based sampling which can introduce sampling bias by selecting men who visit venues and possibly oversampling men who visit venues more frequently. These data were not weighted to reflect participants' differing probabilities of being sampled. Therefore, our data may not be representative of all MSM in Puerto Rico, limiting the generalizability of study findings. Though data were not weighted, venue-based sampling does allow for random sampling of venue-day-times in order to minimize bias in samples of venue-visiting MSM. This study may have been subject to social desirability bias, as sexual and other risk behaviors may have been underreported while positive prevention behaviors may have been overreported. If this bias were present, we would anticipate our main outcome of recent HIV testing to have been overestimated, indicating that recent testing may in fact be lower among MSM in San Juan. Despite these limitations, this analysis makes an important contribution to the current literature by being the first study to evaluate HIV testing and associated behaviors among MSM in the San Juan region.

This analysis has provided important insights for future HIV prevention initiatives focusing on HIV testing among MSM in Puerto Rico. Efforts to promote HIV testing should emphasize at least annual HIV testing among all sexually active MSM, including those with fewer partners.¹⁴ Encouraging annual visits to a health provider could increase the uptake of recent HIV testing in the clinical setting. Of particular importance, disclosure of male-male attraction/sex in conversations with health providers will be needed to overcome barriers and support HIV testing in this population. Future research should explore the impact that social constructs such as stigma against HIV and/or same-sex practices may have on the ability of MSM to disclose same-sex behavior in the clinical setting and how disclosure may be best promoted at the patient-provider level. Understanding and incorporating these identified factors into future HIV testing initiatives may help increase awareness of HIV infection and recent HIV testing for MSM in Puerto Rico.

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References

1. Beyrer C, Baral SD, van Griensven F, et al. Global epidemiology of HIV infection in men who have sex with men. *Lancet*. 2012; 380:367–377. [PubMed: 22819660]
2. Centers for Disease Control and Prevention. Diagnosed HIV Infection among Adults and Adolescents in Metropolitan Statistical Areas—United States and Puerto Rico, 2011. HIV Surveillance Supplemental Report. 2013; 18(8) Published 2014.
3. Wejnert C, Le B, Rose CE, et al. HIV infection and awareness among men who have sex with men—20 cities, United States, 2008 and 2011. *PLoS One*. 2013; 8:e76878. [PubMed: 24194848]
4. Centers for Disease Control and Prevention. HIV Risk, Prevention, and Testing Behaviors—National HIV Behavioral Surveillance System, Men Who Have Sex with Men, 20 U.S. Cities, 2011. HIV Surveillance Special Report. 2014; 8
5. Sanchez T, Finlayson T, Drake A, et al. Human immunodeficiency virus (HIV) risk, prevention, and testing behaviors—United States, National HIV Behavioral Surveillance System: men who have sex with men, November 2003–April 2005. *MMWR Surveill Summ*. 2006; 55:1–16.
6. United States Office of Management and Budget. Update of Statistical Area Definitions and Guidance on Their Uses. 2009.
7. U.S. Census Bureau. Annual Estimates of the Population of Metropolitan and Micropolitan Statistical Areas in Puerto Rico: April 1, 2000 to July 1, 2009. 2009.
8. U.S. Census Bureau. Annual Estimates of the Resident Population for Municipios of Puerto Rico: April 1, 2000 to July 1, 2009 (PRM-EST2009-01). 2009.
9. Finlayson TJ, Le B, Smith A, et al. HIV risk, prevention, and testing behaviors among men who have sex with men—National HIV Behavioral Surveillance System, 21 U.S. cities, United States, 2008. *MMWR Surveill Summ*. 2011; 60:1–34.
10. Cooley LA, Wejnert C, Rose CE, et al. Increases in recent HIV testing among men who have sex with men coincide with the Centers for Disease Control and Prevention’s expanded testing initiative. *Clin Infect Dis*. 2015; 60:483–485. [PubMed: 25352589]
11. Cooley LA, Oster AM, Rose CE, et al. Increases in HIV testing among men who have sex with men—National HIV Behavioral Surveillance System, 20 U.S. Metropolitan Statistical Areas, 2008 and 2011. *PloS one*. 2014; 9:e104162. [PubMed: 25180514]
12. MacKellar DA, Gallagher KM, Finlayson T, et al. Surveillance of HIV risk and prevention behaviors of men who have sex with men—a national application of venue-based, time-space sampling. *Public Health Rep*. 2007; 122(Suppl 1):39–47. [PubMed: 17354526]
13. Barros AJ, Hirakata VN. Alternatives for logistic regression in cross-sectional studies: an empirical comparison of models that directly estimate the prevalence ratio. *BMC Med Res Methodol*. 2003; 3:21. [PubMed: 14567763]
14. Branson BM, Handsfield HH, Lampe MA, et al. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. *MMWR Recomm Rep*. 2006; 55(RR-14):1–17. quiz CE11-14.
15. Jaffe HW, Choi K, Thomas PA, et al. National case-control study of Kaposi’s sarcoma and *Pneumocystis carinii* pneumonia in homosexual men: Part 1. Epidemiologic results. *Ann Intern Med*. 1983; 99:145–151. [PubMed: 6603806]
16. Shelton JD, Halperin DT, Nantulya V, et al. Partner reduction is crucial for balanced “ABC” approach to HIV prevention. *BMJ*. 2004; 328:891–893. [PubMed: 15073076]
17. Sullivan PS, Salazar L, Buchbinder S, et al. Estimating the proportion of HIV transmissions from main sex partners among men who have sex with men in five US cities. *AIDS*. 2009; 23:1153–1162. [PubMed: 19417579]
18. Davidovich U, de Wit J, Albrecht N, et al. Increase in the share of steady partners as a source of HIV infection: a 17-year study of sero-conversion among gay men. *AIDS*. 2001; 15:1303–1308. [PubMed: 11426076]
19. Lopez-Quintero C, Shtarkshall R, Neumark YD. Barriers to HIV-testing among Hispanics in the United States: analysis of the National Health Interview Survey, 2000. *AIDS Patient Care STDS*. 2005; 19:672–683. [PubMed: 16232051]

20. Sullivan PS, Stephenson R, Grazer B, et al. Adaptation of the African couples HIV testing and counseling model for men who have sex with men in the United States: an application of the ADAPT-ITT framework. Springerplus. 2014; 3:249. [PubMed: 24877036]
21. Oster AM, Russell K, Wiegand RE, et al. HIV infection and testing among Latino men who have sex with men in the United States: the role of location of birth and other social determinants. PLoS One. 2013; 8:e73779. [PubMed: 24147151]
22. Moyer VA. U.S. Preventive Services Task Force. Screening for HIV: U.S. Preventive Services Task Force Recommendation Statement. Ann Intern Med. 2013; 159:51–60. [PubMed: 23698354]
23. Wall KM, Khosropour CM, Sullivan PS, et al. J Int Assoc Physicians AIDS Care (Chic). 2010; 9:284–288. [PubMed: 20841438]
24. Bernstein KT, Liu KL, Begier EM, et al. Same-sex attraction disclosure to health care providers among New York City men who have sex with men: Implications for HIV testing approaches. Arch Intern Med. 2008; 168:1458–1464. [PubMed: 18625927]
25. Varas-Díaz N, Neilands TB, Malavé Rivera S, et al. Religion and HIV/ AIDS stigma: Implications for health professionals in Puerto Rico. Glob Public Health. 2010; 5:295–312. [PubMed: 20087809]
26. Ruiz-Torres Y, Cintrón-Bou FN, Varas-Díaz N. AIDS-related stigma and health professionals in Puerto Rico. Interam J Psychol. 2007; 41:49–56. [PubMed: 21423837]
27. The Fenway Institute at Fenway Health. [Accessed June 20, 2014] Publications and Presentations. 2013. <http://thefenwayinstitute.org/publications-presentations/>
28. Desmond Tutu HIV Foundation. [Accessed June 20, 2014] Men who have sex with men: An Introductory Guide for Health Workers in Africa Revised Edition. 2011. <http://www.desmondtutihivfoundation.org.za/documents/MSM-Manual.pdf>
29. Said MA, German D, Flynn C, et al. Uptake of testing for HIV and syphilis among men who have sex with men in Baltimore, Maryland: 2004–2011. AIDS Behav. 2015; 19:2036–2043. [PubMed: 26078117]
30. Beyrer C, Sullivan PS, Sanchez J, et al. A call to action for comprehensive HIV services for men who have sex with men. The Lancet. 2012; 380:424–438.

TABLE 1

Selected Characteristics of MSM—San Juan, Puerto Rico, National HIV Behavioral Surveillance: Men Who Have Sex with Men, 2011

Characteristics	Total (N = 352)	
	n	(%)
Demographic		
Age, y		
18–24	110	(31)
25–29	64	(18)
30–39	98	(28)
40	80	(23)
Education		
High school diploma or less	89	(25)
Some college or technical college	100	(28)
College or higher education	163	(46)
Annual household income *		
US \$19,999	181	(52)
US \$20,000 to US \$39,999	100	(29)
US \$40,000	67	(19)
Employment status		
Employed full time	203	(58)
Employed part time	56	(16)
Unemployed	40	(11)
Other †	53	(15)
Health insurance type ‡		
None	77	(22)
Private only §	176	(50)
Public only ¶	60	(17)
Other/multiple	38	(11)
Sexual identity		
Homosexual	301	(86)
Bisexual/heterosexual	51	(14)
Recruitment venue		
Bar	179	(51)
Café or restaurant	24	(7)
Dance club	90	(26)
Social organization	13	(4)
Sex establishment or environment	9	(3)
Other //	37	(11)
Most recent HIV test		
Never	64	(18)

Characteristics	Total (N = 352)	
	n	(%)
Greater than 12 mo ago	113	(32)
Less than or equal to 12 mo ago	175	(50)
HIV NHBS test results ^{**}		
HIV-negative	303	(93)
HIV-positive, newly diagnosed	22	(7)
HIV-related behaviors		
No. male partners, past 12 mo		
1	128	(36)
2	68	(19)
3	57	(16)
4	99	(28)
Condomless anal sex with male partner, past 12 mo		
No	139	(39)
Yes	213	(61)
Female sex partner, past 12 mo		
No	324	(92)
Yes	28	(8)
Non-injection drug use, past 12 mo ^{†, ††}		
No	291	(83)
Yes	60	(17)
Told health care provider that they are attracted to or have sex with men		
No	178	(51)
Yes	174	(49)
Visited health care provider, past 12 mo		
No	97	(28)
Yes	255	(72)
Diagnosed with sexually transmitted infection, past 12 mo		
No	334	(95)
Yes	18	(5)
Total	352	(100) ^{‡‡}

* Four observations were missing for this variable.

[†] Includes full-time students, homemaker, retired, disabled, and other employment not specified.

^{††} One observation was missing for this variable.

[§] Coverage through private insurance policies or employer, TRICARE, CHAMPUS, or membership in a health maintenance organization.

[¶] Coverage through Medicare, Medicaid, or Veterans Administration.

^{//} "Other" recruitment venues included faith-based groups and dance groups.

** HIV-negative participants had self-reported being HIV-negative or unknown during the survey and had a confirmed negative HIV test. Newly diagnosed HIV-positive participants had self-reported being HIV-negative but had a confirmed HIV-positive test result. There were 27 persons who did not consent to HIV testing at the NHBS study event and therefore had missing values.

†† Non-injection drug use included: crystal meth, crack cocaine, powdered cocaine, downers, painkillers, hallucinogens, ecstasy, heroin, poppers, GHB, and ketamine.

†† Percentages may not total to 100 due to rounding.

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TABLE 2
 Factors Associated With Testing for HIV in the Past 12 Months—San Juan, Puerto Rico, National HIV Behavioral Surveillance: Men Who Have Sex with Men, 2011, N = 352

Characteristics	HIV Test in Past 12 mo		Unadjusted Prevalence Ratio	95% CI		P
	n	(%)		Lower	Upper	
Age, y						0.48
18–24	51	(46)	Referent			
25–29	32	(50)	1.1	0.8	1.5	
30–39	55	(56)	1.2	0.9	1.6	
40	37	(46)	1.0	0.7	1.4	
Education						0.11
High school diploma or less	37	(42)	Referent			
Some college or technical college	48	(48)	1.2	0.8	1.6	
College or higher education	90	(55)	1.3	1.0	1.8	
Health insurance type*						0.20
None	32	(42)	Referent			
Private only [†]	97	(55)	1.3	1.0	1.8	
Public only [‡]	28	(47)	1.1	0.8	1.6	
Other/multiple	17	(45)	1.1	0.7	1.7	
No. male partners, past 12 mo						<0.01
1	48	(38)	Referent			
2	41	(60)	1.6	1.2	2.2	
3	26	(46)	1.2	0.8	1.7	
4	60	(61)	1.6	1.2	2.1	
Condomless anal sex with male partner, past 12 mo						0.98
No	69	(50)	Referent			
Yes	106	(50)	1.0	0.8	1.2	
Female sex partner, past 12 mo						0.45
No	163	(50)	Referent			
Yes	12	(43)	0.9	0.5	1.3	
Non-injection drug use, past 12 mo ^{*,§}						0.04

Characteristics	HIV Test in Past 12 mo		Unadjusted Prevalence Ratio	95% CI		P
	n	(%)		Lower	Upper	
No	137	(47)	Referent			
Yes	37	(62)	1.3	1.04	1.7	<0.01
Told health care provider that they are attracted to or have sex with men						
No	72	(40)	Referent			
Yes	103	(59)	1.5	1.2	1.8	<0.01
Visited health care provider, past 12 mo						
No	35	(36)	Referent			
Yes	140	(55)	1.5	1.1	2.0	0.35
Diagnosed with sexually transmitted infection, past 12 mo						
No	168	(50)	Referent			
Yes	7	(39)	0.8	0.4	1.4	
Total	175	(50)				

* One observation was missing for this variable.

[†] Coverage through private insurance policies or employer, TRICARE, CHAMPUS, or membership in a health maintenance organization.

[‡] Coverage through Medicare, Medicaid, or Veterans Administration.

[§] Non-injection drug use included: crystal meth, crack cocaine, powdered cocaine, downers, painkillers, hallucinogens, ecstasy, heroin, poppers, GHB, and ketamine.

Multivariate Model of Testing for HIV in the Past 12 Months— San Juan, Puerto Rico, National HIV Behavioral Surveillance: Men Who Have Sex with Men, 2011, N = 352

TABLE 3

Characteristics	HIV Test in Past 12 mo		Adjusted PR	95% CI		P
	n	(%)		Lower	Upper	
No. male partners, past 12 mo						
1	48	(38)	Referent			<0.01
2	41	(60)	1.6	1.2	2.1	
3	26	(46)	1.2	0.9	1.7	
4	60	(61)	1.5	1.2	2.0	
Visited health care provider, past 12 mo						
No	35	(36)	Referent			0.02
Yes	140	(55)	1.4	1.04	1.8	
Told health care provider that they are attracted to or have sex with men						
No	72	(40)	Referent			<0.01
Yes	103	(59)	1.4	1.1	1.7	
Total	175	(50)				

PR indicates prevalence ratio.

Use of Prevention Services and HIV Testing in the Past 12 Months—San Juan, Puerto Rico, National HIV Behavioral Surveillance: Men Who Have Sex with Men, 2011, N = 352

TABLE 4

Characteristic	Total		HIV Test in Past 12 mo		Unadjusted PR	95% CI		P
	N	(%)	n	(%)		Lower	Upper	
Tested for syphilis, past 12 mo*								<0.01
No	252	(72)	97	(38)	Referent			
Yes	98	(28)	78	(80)	2.1	1.7	2.5	
Received free condoms, past 12 mo								<0.01
No	113	(32)	40	(35)	Referent			
Yes	239	(68)	135	(56)	1.6	1.2	2.1	
Received either individual [†] or group-level [‡] HIV prevention intervention, past 12 mo								<0.01
No	256	(73)	106	(41)	Referent			
Yes	96	(27)	69	(72)	1.7	1.4	2.1	
Total	352	(100) [§]	175	(50)				

*Two observations were missing for this variable.

[†]One-on-one conversation with an outreach worker, a counselor, or a prevention program worker about ways to protect against HIV or other sexually transmitted diseases.

[‡]Small-group discussion about ways to protect against HIV or other sexually transmitted diseases.

[§]Percentages may not total to 100 due to rounding.

PR indicates prevalence ratio.