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Awareness, Willingness, and Use of Pre-exposure Prophylaxis among Men Who Have Sex with Men in Washington, DC and Miami-Dade County, FL: National HIV Behavioral Surveillance, 2011 and 2014

Rudy Patrick, MPH[1], **David Forrest, PhD**[2], **Gabriel Cardenas, MPH**[2], **Jenevieve Opoku, MPH**[3], **Manya Magnus, PhD, MPH**[1], **Gregory Phillips II, PhD**[4], **Alan Greenberg, MD, MPH**[1], **Lisa Metsch, PhD**[5], **Michael Kharfen**[3], **Marlene LaLota, MPH**[6], and **Irene Kuo, PhD, MPH**[1]

[1]George Washington University Milken Institute School of Public Health, Washington, DC

[2]University of Miami Miller School of Medicine. Miami, FL

[3]District of Columbia Department of Health, Washington, DC

[4]Northwestern University Feinberg School of Medicine, Chicago, IL

[5]Columbia University Mailman School of Public Health, New York, NY

[6]Florida Department of Health, Tallahassee, FL

Abstract

Introduction—Despite the effectiveness of oral PrEP for HIV prevention, knowledge and uptake of this new prevention intervention over time has not been fully studied. Using NHBS data from two urban areas highly impacted by HIV, we examined awareness, use, and willingness to use daily oral PrEP and factors associated with willingness to take oral PrEP among MSM over time.

Methods—MSM from Washington, DC and Miami, FL were recruited in 2011 and 2014 using venue-based sampling. Participants completed behavioral surveys and HIV testing. Awareness, use, and willingness to use oral PrEP were examined. Demographic and behavioral correlates of being “very likely” to use PrEP in 2011 and 2014 were assessed.

Results—PrEP awareness increased from 2011 to 2014 in both cities (DC: 39.1% to 73.8%;Miami: 19.4% to 41.2%), but use remained low in 2014 (DC: 7.7%;Miami: 1.4%). Being very likely to use PrEP decreased over time in DC (61% to 48%), but increased in Miami (48% to 60%). In DC, minority race was associated with increased odds of being very likely to use PrEP, while a reduced odds of being very likely to use PrEP was observed for MSM with 1 or 2-5 partners versus having 6+ partners. In Miami, a higher proportion of White versus Hispanic MSM reported being very likely to use PrEP in 2011, but this observation was reversed in 2014.

Contact author: Irene Kuo, PhD, MPH, Milken Institute School of Public Health, George Washington University, 950 New Hampshire Avenue NW, Suite 500, Washington, DC 20052, Phone: 202-994-0367, Fax: 202-994-0082, ikuo@gwu.edu.

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Preliminary findings from this study were presented at the National HIV Prevention Conference in Atlanta, GA on December 8, 2015.

Conclusion—Geographic differences in awareness, use, and willingness to use PrEP indicate that innovative strategies are needed to educate MSM about this effective prevention strategy.

Keywords

men who have sex with men; pre-exposure prophylaxis; willingness to use PrEP; National HIV Behavioral Surveillance

Introduction

In the United States (U.S.), men who have sex with men (MSM) continue to be disproportionately affected by HIV. While MSM represent only 3-10% of the U.S. population,[1] they account for nearly 60% of new HIV infections.[2] Nationally, young, Black, and Hispanic MSM represent a majority of new infections,[3,4] and these trends persist at the local level in Washington, DC and Miami-Dade County, Florida, two racially and ethnically diverse HIV epicenters.[5,6]

In 2010, data from one of the first studies on the efficacy of HIV antiretroviral medication as HIV prevention provided evidence for the use of pre-exposure prophylaxis (PrEP) for HIV prevention among men who have sex with men.[7] Based on additional evidence from subsequent trials[8-10], the U.S. Food and Drug Administration (FDA) approved Truvada (Tenofovir disoproxil/emtricitabine) for use as once-daily oral PrEP in 2012[11], and the Centers for Disease Control and Prevention (CDC) released clinical recommendations for the use of PrEP in 2014.[12] Although there were initial concerns that PrEP would be ineffective in real-world use due to issues with adherence and risk compensation, PrEP studies outside of clinical trial populations have shown promising results among those with higher levels of adherence and those who remained on the intervention, compared to those who discontinued taking PrEP.[13] Open-label demonstration studies in the U.S. and England have shown high levels of protection against HIV.[14,15] Volk et al. found no new HIV infections among PrEP users attending a clinic in San Francisco, CA, over 388 person-years of follow-up, despite high rates of sexually transmitted infections (STIs) and a reported decrease in condom use among a subset of participants.[16]

Despite these promising findings, initial uptake of PrEP outside of research and demonstration projects has been slow. An analysis of U.S. pharmacy data from 2012 to 2014, found 3,253 unique individuals, 68% of whom were male, had used PrEP.[17] More recent studies, however, have found significant increases in PrEP use, as reported by urban and internet-based samples of MSM. Between 2013 and 2015, PrEP use among MSM in New York City increased from 2.1% to 14.8%.[18] A national internet sample of MSM found significant increases in self-reported PrEP use in MSM in several U.S. cities from 2012-2015.[19] A study of high-risk MSM in Seattle, WA, found the largest reported increase in PrEP use from 5% to 31% between 2012 and 2015, with 23% currently taking PrEP.[20] While these studies reveal increases in PrEP use, there is still much work to be done in light of the estimated 492,000 MSM eligible for PrEP in the US.[21]

Understanding knowledge of and willingness to use PrEP among MSM at high-risk for HIV is an important step to increasing PrEP utilization. To date, few studies have examined

willingness to use PrEP among MSM. Prior to FDA approval in 2012, Mimiaga et al. found that while knowledge of PrEP was low among MSM in Boston, there was a high level of interest in using PrEP.[22] Among MSM in Denver, between 2008 and 2014 awareness significantly increased over time, but less than 50% had ever heard of PrEP in 2014,and willingness to use PrEP did not significantly change over time. [23] A recent study of 206 highly sexually active MSM in New York City, between 2011 and 2013, also found no significant change in willingness, despite a significant increase in awareness of PrEP, from 53% to 72%.[24] In a national study among internet-recruited MSM, a slight increase in self-reported willingness to use PrEP was found between 2012 and 2015,[19] increasing from 39.3% to 49.6%.

Given the increasing rates of HIV among MSM and the need for increased prevention efforts, it is imperative that we better understand the awareness and uptake of PrEP in communities that have been highly impacted by HIV in order to target PrEP-related prevention programming. This study examines changes in awareness of PrEP, self-reported use and degree of willingness to use PrEP among a community-recruited sample of sexually active MSM from 2011 to 2014 in two urban areas highly impacted by HIV—Washington, DC and Miami-Dade County, FL. Demographic characteristics, and sexual and substance use behaviors were assessed as correlates of self-reported willingness to use PrEP in both 2011 and 2014.

Methods

Washington, DC and Miami-Dade County, FL, two urban centers with high HIV prevalence, were funded by the CDC through the Enhanced Comprehensive HIV Prevention Planning Initiative (ECHPP) to maximize uptake of high impact HIV prevention interventions.[25] As a part of this initiative, the Centers for AIDS Research in Washington, DC and Miami-Dade County, FL proposed a collaboration to examine PrEP uptake through the role of both the provider and potential consumers.[26,27] In order to address the latter aim, two measures were added to the supplemental local NHBS questions in both cities to assess willingness to use PrEP and perceptions of condom use behavior if using PrEP.

Data from the CDC National HIV Behavioral Surveillance (NHBS) system conducted in Washington, DC and Miami-Dade County, FL during the 2011 (MSM-3) and 2014 (MSM-4) data collection cycles focusing on MSM were analyzed. The NHBS system began in 2003 and during 2011 and 2014, the years of data collection used in this analysis, NHBS was conducted in 20 cities. NHBS is a serial, cross-sectional behavioral surveillance community survey that is conducted among three populations at highest risk for HIV: MSM, persons who use injection drugs, and heterosexuals at elevated risk for HIV. Recruitment for the MSM cycles in this analysis were completed in 2011 and 2014, and interviews were conducted among men recruited using venue-based time-space sampling (VBS).[28] Briefly, in each city, a sampling frame of all eligible venues was generated using formative research that included all potential public venues from which MSM could be recruited. Eligible venues were those at which at least 50% of the male attendees were MSM (assessed by formative research, including street intercept interviews). Venues and days and times of the week were randomly selected for community-based recruitment on a monthly basis.

Study eligibility included being male assigned at birth and currently identifying as male, 18 years of age or older, having had sex with a man in the past year, and living in the metropolitan statistical area in which the study was conducted. Men were approached and screened by study staff to ascertain eligibility to participate in the survey, and eligible individuals were consented and completed a face-to-face interviewer-administered behavioral survey using a handheld or tablet computer. Questions included demographic characteristics, sexual and drug use risk behaviors, HIV testing behaviors, and utilization of HIV prevention programs. All participants were offered rapid HIV-testing; self-reported and preliminary HIV-positive individuals were confirmed using Western Blot and were immediately referred to care. Individuals received incentives for completing the survey ($25 in Washington, DC and $25 in Miami-Dade County, FL) and for being tested for HIV ($10 in Washington, DC and $25 in Miami-Dade County, FL).

Measures

To assess awareness and use of antiretroviral medications (ARVs) as HIV prevention, participants were asked whether they had “ever heard of people who do not have HIV taking anti-HIV medicines, to keep from getting HIV?” and if they had used PrEP in the last 12 months. Participants who reported any PrEP use in the last 12 months were also asked where they received ARVs (doctor or health care provider, sex partner, friend or relative, internet, or some other location).

To assess willingness to use PrEP, participants were presented with a scenario in which daily oral PrEP was available for free or covered by their health insurance and asked how likely they would be to take it with the following response options: “very likely”, “somewhat likely”, or “not at all likely”. For this analysis, participants responding very likely were considered to be willing to use PrEP, while those responding as being somewhat or not at all likely to use PrEP were coded as not being willing to use PrEP. An additional follow-up question was asked regarding whether participants strongly agreed, agreed, disagreed or strongly disagreed with the statement “If I am taking HIV medicines to prevent HIV infection, I will no longer need to use condoms or practice safer sex.” For this analysis, responses were dichotomized as “strongly agree/agree” and “strongly disagree/disagree.”

Data Analysis

All analyses were stratified by city. Demographic characteristics, sexual risk and drug use behaviors, and HIV testing behaviors, as well as reported awareness, use, and willingness to use PrEP were examined in both 2011 and 2014. For categorical variables, frequencies were reported by cycle year, and χ^2 or Fisher's exact tests were used to assess differences in the distribution of variables across cycle years. Logistic regression was used to generate unadjusted and adjusted odds ratios (ORs and aORs, respectively) and 95% confidence intervals (CI) to assess correlates of being “very likely” vs. “somewhat/not at all likely” to use PrEP. In order to produce comparable models across cities, variables that attained a $p<0.05$ statistical significance in univariate analyses in either city were included in each city's model.

In 2011 and 2014, 503 and 510 eligible MSM completed surveys in Washington, DC and 511 and 534 completed surveys in Miami-Dade County, respectively. For this analysis, the sample was limited to participants who responded to locally-developed questions on willingness to use PrEP. Self-reported HIV-positive individuals were also excluded because this analysis focuses on use of and willingness to use PrEP for HIV prevention. Because HIV rapid test results were given after the survey was finished, individuals who were newly identified as preliminary positive were included in this analysis as their responses were captured prior to disclosure of results. Therefore, in both cities, a total of 602 confirmed HIV-negative or newly diagnosed MSM were included in 2011 (n=323 in Washington, D.C. and n=279 in Miami-Dade County) and 774 were included in 2014 (n=313 in Washington, DC and n=431 in Miami-Dade County). All analyses were completed using SAS version 9.3 (Cary, NC).

Results

As seen in Table 1, in Washington, DC a smaller proportion of MSM in 2011 versus 2014 reported at least some college education (83.9% vs. 91.4%, p=0.004), having received an HIV test in the last 12 months (69.7% vs. 77.3%, p=0.03) and condomless anal sex at last sex (33.4% vs. 42.8%, respectively, p=0.02). In Miami-Dade County, there were several significant demographic differences between MSM respondents from 2011 and 2014. In 2014 compared to 2011, a lower proportion of MSM were 18-24 (20.9% vs. 35.8%, respectively; p<0.0001), but there were increases in the proportions of White MSM (29.5% vs. 18.3%, respectively; p=0.008). The proportion of MSM who reported having received an HIV test in the last 12 months significantly increased from 2011 to 2014 (58.8% vs. 71.2%, respectively; p=0.0006).

Table 2 displays self-reported awareness, use, and willingness to use PrEP for Washington, DC and Miami-Dade County by cycle year. Between 2011 and 2014, there was a significant increase in awareness of “people taking ARVs to prevent HIV acquisition” in both Washington, DC (39.1% vs. 73.8%, respectively; p<0.0001) and Miami-Dade County (19.4% vs. 41.2%, respectively; p<0.0001). Similarly, the reported use of PrEP in the last 12 months increased in both cities from 2011 to 2014, but was only significant in Washington, DC, with an increase in PrEP use from 0% in 2011 to 7.7% in 2014 (p<0.0001). Although low, the proportions of MSM reporting they strongly agreed or agreed that they would no longer need to use condoms if taking PrEP were significantly higher in both jurisdictions between 2011 and 2014 (Washington, DC: 4.7% vs. 8.7%, respectively; p=0.04; Miami-Dade County: 5.3% vs. 9.8%, respectively; p=0.04).

Univariate and multivariate analyses revealed several differences between 2011 and 2014 in both Washington, DC and Miami-Dade County, FL, and results are presented separately by city (Table 3).

Washington, DC

In 2011 the characteristics positively associated with being very likely to use PrEP included: being younger than 35 years (18-24 years: OR=3.40; 95% CI= 1.78, 6.48; 25-34 years: OR=2.04; 95% CI=1.22, 3.39), being Hispanic versus White (OR=3.50; 95% CI= 1.52,

8.05), an annual household income <$20,000 compared to $40,000 or more (OR=2.53; 95% CI=1.22, 5.21), and infrequent binge drinking (<1/week) vs. never drinks (OR=2.57; 95% CI=1.04, 6.37). In the multivariate model, younger MSM (18-24 years old) were more than twice as likely (OR=2.28; 95% CI=1.08, 4.84) to report being very likely to use PrEP compared to MSM 35 years or older. Hispanic MSM also had higher odds of being very likely to use PrEP compared to White MSM (OR=3.85; 95% CI=1.56, 9.51). MSM reporting 2-5 male sexual partners in the last 12 months had reduced odds of being very likely to use PrEP compared to those with 6 or more partners (OR=0.55; 95% CI=0.31, 0.95).

In 2014, MSM reporting fewer than 6 male sexual partners (vs. 6+) had decreased odds of being very likely to use PrEP (1 partner: OR=0.46; 95% CI=0.23, 0.94; 2-5 partners: OR=0.58; 95% CI=0.36, 0.93). When compared to White MSM, Black MSM had higher odds of being very likely to use PrEP; although this was not statistically significant, this was retained in the overall adjusted model. In 2014, the independent correlates of being very likely to use PrEP included being Black (OR=1.80; 95% CI=1.04, 3.13) and having 1 (OR=0.38; 95% CI=0.18, 0.80) or 2-5 (OR=0.45; 95% CI=0.27, 0.75) compared to 6 or more male sexual partners in the last 12 months.

Miami-Dade County

For Miami-Dade County in 2011, there were no significant univariate associations with being very likely to use PrEP. Among MSM in Miami-Dade County, independent correlates in 2011 included being Hispanic (OR=0.39; 95% CI=0.16, 0.93), reporting non-injection drug use in the last 12 months (OR=0.54; 95% CI=0.32, 0.92) and an annual income $20,000-$39,999 vs. ≥$40,000 (OR=1.86; 95% CI=1.01, 3.41).

In 2014, being Hispanic (OR=2.13; 95% CI=1.07, 4.24), and newly identified as HIV-positive (OR=2.83; 95% CI=1.27, 6.30) were associated with being very likely to use PrEP. In 2014, being Hispanic (OR=2.19; 95% CI=1.09, 4.41) and newly identified as HIV positive (OR=2.87; 95% CI=1.27, 6.50) were associated with increased odds of being very likely to use PrEP among MSM.

Discussion

Among community recruited MSM in Washington, DC and Miami-Dade County, FL, awareness and use of PrEP increased from 2011 to 2014. In Washington, DC a lower proportion of MSM reported being very likely to use PrEP in 2014 vs. 2011, while in Miami-Dade County this proportion increased over time. Although awareness of PrEP increased over time in both cities, in 2014 more than 70% of MSM in Washington, DC had heard of people taking ARVs to prevent HIV acquisition, while only 40% had in Miami-Dade County. MSM in Miami-Dade similarly reported a lower proportion of PrEP use than Washington, DC in both 2011 and 2014. Of note, although the majority of MSM across time points in both cities believed they would use condoms and practice safe sex if using PrEP, this sentiment decreased over time, suggesting that other protective behaviors may change with increased PrEP use, as evidenced by recent reports revealing high rates of STI among PrEP users.[14,16,29] This may be of concern, given that behavior changes, such as increased

condomless sex, may continue even if a person discontinues PrEP use, thus potentially resulting in heightened HIV risk over time.

Two years after FDA approval, and nearly four years after release of the iPrEX study results, PrEP use was low in both cities. In 2014, PrEP use among MSM in Miami-Dade County was similar to internet-recruited MSM residing in rural areas[19] and in San Francisco prior to the release of iPrEX data,[30] while Washington, DC was comparable to internet-recruited MSM from Los Angeles and Chicago between 2014 and 2015.[19] Although PrEP use in both cities was low compared to some recent findings among samples of high-risk MSM[20,24], our sample was not limited to MSM exhibiting high-risk behaviors, and thus might be expected to be lower. Slow uptake even with increased awareness in both jurisdictions, may be related to stigma associated with being assumed HIV positive or being labeled “high-risk” as result of using PrEP.[31] The U.S. PrEP Demonstration project found that overall uptake of PrEP was high when offered in STD clinics and a community health center, and that participants from Miami or Washington, DC and those who reported previous knowledge of PrEP were more likely to enroll.[32] These findings indicate the potential for future increases in PrEP use as both cities expand access to and promotion of PrEP.

While other studies have seen slight increases over time in willingness to use PrEP, [19,24] our study found substantial changes in being willing to use PrEP in both cities. The direction of this change varied, with a lower proportion of MSM in Washington, DC and a higher proportion of MSM in Miami-Dade County to report being very likely to use PrEP in 2014 vs. 2011. These differences may be related to the level of awareness around PrEP in each city, since less than 50% of MSM in Miami had heard of PrEP in 2014 compared to over 70% in Washington, DC. Between 2011 and 2014, both Miami-Dade County and Washington, DC were sites for the U.S. PrEP Demonstration Project, which similarly found that participants in Miami-Dade County reported lower PrEP awareness than those in Washington, DC.[32] In addition, Washington, DC was also a site for HPTN 069[33] and HPTN 073.[34] The presence of more PrEP trials before and during data collection in 2014, may partially explain the higher level of awareness of PrEP in Washington, DC relative to Miami-Dade County.

The results of this this study should be considered in the context of its limitations. These samples were recruited using VBS; thus these results may not be generalizable to non-venue attending MSM. These data were not weighted to account for variation in venue attendance or likelihood of being selected, which may have also result in the decreased ability to generalize behaviors across men who do attend venues. This study is based on self-report data which may be affected by recall or social desirability bias, but this is appropriate to outcome measures which include perceptions and are otherwise unmeasurable. Although interviewers were highly trained and routine data quality checks were conducted, there was the possibility of recording errors and intra/inter-interviewer differences in administration. Additionally, increases in awareness and uptake in 2014 may be driven by local PrEP demonstration projects that had already been launched in these respective municipalities, and therefore these data may actually reflect the effects of local public health programming. Lastly, due to data sharing restrictions, we were unable to conduct between city analyses.

To our knowledge, this is one of the first studies to examine degree of willingness to use PrEP among community-recruited MSM over time, prior to large scale public health efforts in each city to increase PrEP uptake.[35,36] Our findings show that although awareness of PrEP may be increasing, use among MSM in Washington, DC and Miami-Dade County remains low. Geographic difference in willingness to use PrEP between 2011 and 2014 highlight the need for regionally tailored PrEP information and behavioral interventions to increase willingness and use among MSM. With the expansion of PrEP services in both jurisdictions, access to PrEP should be explored in future analyses.

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Table 1

Demographic and Behavioral Characteristics of men who have sex with men recruited for NHBS in Washington, DC and Miami-Dade County, FL, 2011 and 2014

	Washington, DC			Miami-Dade County, FL		
	2011 (N=323)	**2014 (N=313)**	**p-value**	**2011 (N=279)**	**2014 (N=431)**	**p-value**
Age (years)			0.0972			**<.0001**
18-24	73 (22.6)	64 (20.4)		100 (35.8)	90 (20.9)	
25-34	136 (42.1)	158 (50.5)		90 (32.3)	189 (43.9)	
35+	114 (35.3)	91 (29.1)		89 (31.9)	152 (35.3)	
Race/ethnicity			0.0813			**0.0078**
White	159 (49.2)	128 (40.9)		51 (18.3)	127 (29.5)	
Hispanic	41 (12.7)	44 (14.1)		195 (70.0)	256 (59.4)	
Black/African-American	90 (27.9)	114 (36.4)		28 (10.0)	38 (8.8)	
Other	33 (10.2)	27 (8.6)		5 (1.8)	10 (2.3)	
Education			**0.0043**			0.0649
HS graduate or less	52 (16.1)	27 (8.6)		86 (30.8)	162 (37.6)	
At least some college	271 (83.9)	286 (91.4)		193 (69.2)	269 (62.4)	
Annual household income	n=321	n=312	0.2516	n=274		**0.0457**
<$10,000-$19,999	47 (14.6)	34 (10.9)		83 (30.3)	170 (39.4)	
$20,000-$39,999	49 (15.3)	42 (13.5)		91 (33.2)	121 (28.1)	
$40,000+	225 (70.1)	236 (75.6)		100 (36.5)	140 (32.5)	
Sexual identity	n=321	n=308	0.362	n=278	n=427	**0.0211**
Gay	283 (88.2)	264 (85.7)		230 (82.7)	322 (74.7)	
Bisexual	38 (11.8)	44 (14.3)		48 (17.3)	105 (24.4)	
HIV test, last 12 months	225 (69.7)	242 (77.3)	**0.0289**	164 (58.8)	307 (71.2)	**0.0006**
Newly identified as HIV-positive	10 (3.1)	15 (4.8)	0.2711	26 (9.3)	40 (9.3)	0.9863
Non-injection drug use, last 12 months	144 (44.6)	164 (52.4)	**0.0487**	144 (51.6)	233 (54.1)	0.5233
Marijuana use, last 12 months	113 (35.0)	133 (42.4)	0.0519	121 (43.4)	182 (42.2)	0.7639
Alcohol use, last 12 months			0.0570			0.0590

	Washington, DC			Miami-Dade County, FL		
	2011 (N=323)	**2014 (N=313)**	**p-value**	**2011 (N=279)**	**2014 (N=431)**	**p-value**
Never drinks	23 (7.1)	11 (3.5)		22 (7.9)	63 (14.6)	
Drinks but never binges *	65 (20.1)	48 (15.3)		86 (30.8)	127 (29.5)	
Infrequent binge drinker (<1/week)	119 (36.8)	133 (42.5)		94 (33.7)	136 (31.6)	
Frequent binge drinker (≥1/week)	116 (35.9)	121 (38.7)		77 (27.6)	105 (24.4)	
Number of male sex partners, last 12 months			0.4445			0.0695
1	55 (17.0)	42 (13.4)		55 (19.7)	70 (16.2)	
2-5	145 (44.9)	145 (46.3)		130 (46.6)	179 (41.5)	
6+	123 (38.1)	126 (40.3)		94 (33.7)	182 (42.2)	
Insertive anal sex at last sex	155 (48.0)	156 (49.8)	0.6403	140 (50.2)	248 (57.5)	0.0543
Condomless anal sex at last sex	108 (33.4)	133 (42.8)	**0.0156**	101 (36.2)	140 (32.6)	0.3172

* Binge drinking was defined as 5 or more drinks in one sitting

Table 2

Reported awareness, use, and willingness to use ARVs as prevention among men who have sex with men from Washington, DC and Miami-Dade, County, FL, 2011 and 2014

	Washington, DC			Miami-Dade County, FL		
	2011 (N=323)	**2014 (N=313)**	**p-value**	**2011 (N=279)**	**2014 (N=431)**	**p-value**
Heard of people taking ARVs to prevent HIV acquisition	126 (39.1)	231 (73.8)	**<.0001**	54 (19.4)	177 (41.2)	**<.0001**
Taken PEP, last 12 months	3 (0.9)	22 (7.0)	**<.0001** *	2 (0.7)	13 (3.0)	0.0577 *
Taken PrEP, last 12 months	0 (0.0)	24 (7.7)	**<.0001** *	1 (0.4)	6 (1.4)	0.2552 *
Location where received ARVs	n=3	n=38		n=3	n=15	
Doctor or health care provider	2 (66.7)	35 (92.1)	0.2711 *	3 (100.0)	11 (73.3)	0.9999 *
Sex partner, friend, or relative	1 (33.3)	2(5.3)	0.2086 *	0 (0.0)	0 (0.0)	--
Internet	0 (0.0)	0 (0.0)	--	0 (0.0)	0 (0.0)	--
Some other location	0 (0.0)	1 (2.6)	0.9999 *	0 (0.0)	4 (26.7)	0.9999 *
If a daily HIV pill to prevent you from getting HIV was available in DC for free or was covered by your health insurance, how likely would you be to take it?			**0.0052**			**0.0003**
Very likely	197 (61.0)	151 (48.2)		134 (48.0)	261 (60.6)	
Somewhat likely	79 (24.5)	99 (31.6)		65 (23.3)	98 (22.7)	
Not at all likely	47 (14.6)	63 (20.1)		80 (28.7)	72 (16.7)	
What is the most you would pay monthly for a daily anti-HIV pill if it were proven to reduce your chances of getting HIV? [US Dollars]						
Median (IQR)	30.0 (10-90)	30 (10-60)	0.1495 **	35 (10-100)	20 (10-50)	**0.0098** **
If I am taking HIV medicines to prevent HIV infection, I will no longer need to use condoms or practice safer sex.	n=320	n=310	**0.0430**	n=246	n=418	**0.0394**
Strongly agree/agree	15 (4.7)	27 (8.7)		13 (5.3)	41 (9.8)	
Strongly disagree/disagree	305 (95.3)	283 (91.3)		233 (94.7)	377 (90.2)	

* Fisher's Exact Test

** Wilcoxon Rank Sum Test

Table 3

Unadjusted and adjusted associations with being very likely to use PrEP if it were free and available (vs. somewhat likely/not at all likely) among men who have sex with men from Washington, DC and Miami-Dade County, FL (2011 and 2014)

	Washington, DC				Miami-Dade County, FL			
	2011 (N=323)		2014 (N=313)		2011 (N=279)		2014 (N=431)	
	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Age (years)								
18-24	3.40 (1.78, 6.48) **	2.28 (1.08, 4.84) *	1.67 (0.87, 3.19)	≠	1.51 (0.85, 2.69)	1.87 (0.95, 3.66)	1.33 (0.78, 2.27)	≠
25-34	2.04 (1.22, 3.39) **	1.66 (0.94, 2.95)	0.81 (0.48, 1.35)	≠	1.23 (0.68, 2.21)	1.43 (0.74, 2.76)	1.44 (0.93, 2.22)	≠
35+	1.00 (--)	1.00 (--)	1.00 (--)	≠	1.00 (--)	1.00 (--)	1.00 (--)	≠
Race/ethnicity								
Black/African-American	1.54 (0.90, 2.62)	1.68 (0.94, 3.02)	1.55 (0.93, 2.57)	1.80 (1.04, 3.13) *	0.58 (0.23, 1.47)	0.36 (0.13, 1.02)	1.84 (0.89, 3.83)	1.87 (0.87, 4.03)
Hispanic	3.50 (1.52, 8.05) **	3.85 (1.56, 9.51) **	0.76 (0.38, 1.53)	0.74 (0.36, 1.51)	0.56 (0.25, 1.25)	0.39 (0.16, 0.93) *	2.13 (1.07, 4.24) *	2.19 (1.09, 4.41) *
Other	1.31 (0.61, 2.81)	1.25 (0.55, 2.83)	0.97 (0.41, 2.23)	1.22 (0.51, 2.91)	0.97 (0.14, 6.78)	0.72 (0.09, 5.47)	1.85 (0.45, 7.65)	1.43 (0.33, 6.14)
White	1.00 (--)	1.00 (--)	1.00 (--)	1.00 (--)	1.00 (--)	1.00 (--)	1.00 (--)	1.00 (--)
Non-injection drug use, last 12 months	1.92 (1.21, 3.05) **	1.57 (0.94, 2.63)	1.10 (0.71, 1.72)	≠	0.66 (0.41, 1.06)	0.54 (0.32, 0.92) *	1.08 (0.73, 1.59)	≠
Number of male sex partners, last 12 months								
1	0.54 (0.28, 1.03)	0.75 (0.36, 1.55)	0.46 (0.23, 0.94) *	0.38 (0.18, 0.80) *	0.86 (0.44, 1.67)	0.87(0.42, 1.79)	0.72 (0.41, 1.27)	0.70 (0.39, 1.24)
2-5	0.58 (0.35, 0.96) *	0.55 (0.31, 0.95) *	0.58 (0.36, 0.93) *	0.45 (0.27, 0.75) **	0.82 (0.48, 1.40)	0.79 (0.45, 1.40)	0.74 (0.48, 1.12)	0.69 (0.44, 1.08)
6+	1.00 (--)	1.00 (--)	1.00 (--)	1.00 (--)	1.00 (--)	1.00 (--)	1.00 (--)	1.00 (--)
Newly identified as HIV-positive	2.64 (0.55, 12.7)	≠	3.10 (0.97, 9.97)	3.12 (0.94, 10.43)	1.09 (0.49, 2.45)	≠	2.83 (1.27, 6.30) *	2.87 (1.27, 6.50) *
Annual household income								
<$10,000-$19,999	2.53 (1.22, 5.21) *	1.86 (0.85, 4.08)	1.29 (0.63, 2.65)	≠	1.69 (0.94, 3.05)	1.75 (0.93, 3.26)	1.03 (0.65, 1.62)	≠
$20,000-$39,999	1.45 (0.76, 2.77)	0.93 (0.46, 1.89)	1.26 (0.65, 2.43)	≠	1.60 (0.90, 2.84)	1.86 (1.01, 3.41) *	1.05 (0.64, 1.73)	≠
$40,000+	1.00 (--)	1.00 (--)	1.00 (--)	≠	1.00 (--)	1.00 (--)	1.00 (--)	≠

	Washington, DC				Miami-Dade County, FL			
	2011 (N=323)		2014 (N=313)		2011 (N=279)		2014 (N=431)	
	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Alcohol use, last 12 months								
Never drinks	1.00 (--)	1.00 (--)	1.00 (--)	≠	1.00 (--)	1.00 (--)	1.00 (--)	≠
Drinks but never binges	1.43 (0.55, 3.71)	1.18 (0.41, 3.35)	1.42 (0.38, 5.29)	≠	0.57 (0.22, 1.47)	0.64 (0.23, 1.80)	0.78 (0.42, 1.45)	≠
Infrequent binge drinker (<1/week)	2.57 (1.04, 6.37) *	1.86 (0.68, 5.12)	0.72 (0.21, 2.49)	≠	0.87 (0.34, 2.21)	0.92 (0.32, 2.62)	0.90 (0.49, 1.67)	≠
Frequent binge drinker (≥1/week)	2.29 (0.93, 5.67)	1.56 (0.55, 4.42)	1.65 (0.48, 5.69)	≠	0.86 (0.33, 2.21)	0.98 (0.33, 2.91)	0.93 (0.49, 1.78)	≠
Marijuana use, last 12 months	1.60 (0.99, 2.60)	≠	1.05 (0.48, 2.30)	≠	0.70 (0.43, 1.13)	≠	0.85 (0.57, 1.25)	≠
Insertive anal sex at last sex	1.40 (0.89, 2.20)	≠	1.09 (0.70, 1.70)	≠	0.99 (0.62, 1.58)	≠	1.12 (0.78, 1.65)	≠
Have health insurance	1.315 (0.71, 2.46)	≠	0.99 (0.46, 2.15)	≠	0.85 (0.53, 1.38)	≠	1.07 (0.72, 1.58)	≠
Seen doctor in past 12 months	0.889 (0.49, 1.61)	≠	0.80 (0.44, 1.45)	≠	0.89 (0.54, 1.47)	≠	1.09 (0.73, 1.63)	≠
Sexual identity								
Gay	0.60 (0.29, 1.27)	≠	0.66 (0.35, 1.26)	≠	1.5 (0.80, 2.83)	≠	1.33 (0.85, 2.07)	≠
Bisexual	1.00 (--)	≠	1.00 (--)	≠	1.00 (--)	≠	1.00 (--)	≠
HIV test, last 12 months	1.42 (0.88, 2.30)	≠	1.02 (0.60, 1.73)	≠	0.90 (0.56, 1.45)	≠	0.91 (0.60, 1.40)	≠
Condomless anal sex at last sex	0.85 (0.53, 1.36)	≠	0.89 (0.57, 1.40)	≠	0.86 (0.52, 1.40)	≠	1.09 (0.72, 1.66)	≠

*p<0.05;

**p<0.01;

***p<0.001;

≠Not included in multivariable model because p>0.05