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Pre-Exposure Antiretroviral Prophylaxis (PrEP) attitudes in high risk Boston area MSM: Limited knowledge and experience, but potential for increased utilization after education

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Abstract

Background—Pre-exposure prophylaxis (PrEP) could protect individuals engaging in repeated high-risk behaviors from HIV infection. Understanding the demographic and behavioral predictors of intent to use PrEP may prove useful to identify clinical trial participants.

Methods—In 2007, 227 HIV-uninfected MSM recruited through modified respondent-driven sampling completed an interviewer-administered survey assessing prior PrEP use and awareness, future intent to use PrEP, demographics, sexual risk, psychosocial variables, and drug/alcohol use. Bivariate and multivariable logistic regression procedures examined predictors of intention to use PrEP.

Results—Mean age of participants was 41 (SD=9.1); 54% were non-white. One participant reported prior off-label PrEP use (medication obtained from his HIV-infected brother). Nineteen percent had previously heard of PrEP, while 74% reported intent to use PrEP if available after being educated about its potential. In multivariable analysis controlling for age and race/ethnicity, significant predictors of intent to use PrEP included: less education (OR=7.7; p=0.04), moderate income (OR=13.0; p=0.04), no perceived side effects from taking PrEP (OR=3.5; p=0.001), and not having to pay for PrEP (OR=4.2; p=0.05).

Discussion—Many New England MSM indicated an interest in using PrEP after learning about its potential, particularly if they could obtain PrEP at no expense and if PrEP had no side effects. Less educated MSM and those who knew less about PrEP and antiretroviral therapy (ART) before entering the study were more open to using ART for prevention once they had received some information suggesting its potential value. Findings suggest careful educational messages are necessary to ensure appropriate PrEP use if clinical trials reveal partial efficacy.

Keywords

Pre-exposure prophylaxis (PrEP); NPEP; HIV/AIDS; MSM; prevention

Introduction

According to the Centers for Disease Control and Prevention (CDC), more than one million people are living with HIV infection in the United States.¹ New approaches to HIV prevention are urgently needed to curb the increasing number of new HIV infections identified annually in the U.S., 53% of which occur among men who report having sex with men (MSM).¹ With recent failures in HIV vaccine and non-specific microbicide trials, increasing attention has been focused on the use of oral chemoprophylaxis to prevent HIV transmission and acquisition. Animal and human studies suggest that antiretroviral drugs may be able to play an important role in reducing the risk of HIV infection either as pre-exposure prophylaxis (PrEP) or non-occupational post-exposure prophylaxis (nPEP).²⁻⁴ At the present time, PrEP efficacy trials are underway among heterosexuals in Botswana, female sex workers in several African countries, and among Thai injection drug users;⁵ in the U.S., expanded PrEP safety studies for MSM are underway in Atlanta, San Francisco, and Boston.

Unlike HIV vaccines, or non-antiretroviral microbicides, PrEP/nPEP drugs are readily available. The extent of preventive antiretroviral use among MSM is limited, although anecdotal reports suggest it is happening and that a few medical providers have prescribed PrEP to their high-risk patients.^{6,7} Other studies have documented PrEP awareness and use to be rare among MSM. For example, Liu and colleagues surveyed 1819 HIV-uninfected MSM in California and found that only 16% of the sample reported awareness of PrEP and less than 1% of the sample had ever used PrEP.⁸ Men who reported unprotected anal sex or sex under the influence of a recreational drug in the past 6 months were more likely to have heard of PrEP.

The success of PrEP will be dependent on behavioral variables such as intentions to use it, acceptability, and adherence. Few studies to date have explored behavioral and demographic constructs of PrEP use, and few have focused on predictors of intentions (i.e., likelihood) to use PrEP in the future among MSM. Given that intentions to engage in a given behavior are a proximal predictor of that behavior, the current study, supported by the Theory of Reasoned Action^{9,10} and the Theory of Planned Behavior,¹¹ sought to elucidate the behavioral and demographic associations of intentions to use PrEP (i.e. if shown to be safe and effective) among MSM. Additionally, understanding the demographic and behavioral predictors of intentions to use PrEP may prove useful to identify trial participants for future efficacy studies or programs for its use.

Methods

Participants and Procedures

Between January and October 2007, 227 participants completed a quantitative survey. Participants were eligible if they were biologic males (males at birth) between 18-60 years of age, HIV-uninfected by self-report, and reported anal sex with a man in the preceding 12 months. All study activities took place at Fenway Community Health (FCH), a freestanding health care and research facility specializing in HIV/AIDS care and serving the needs of the lesbian, gay, bisexual, and transgender community in the greater Boston area.¹² The FCH Institutional Review Board approved the study, and each study participant completed an informed consent process.

Recruitment

The study utilized a modified respondent-driven sampling (RDS) method¹³ which we have used successfully in studies of MSM in the Boston area¹⁴ to recruit a diverse sample of MSM. To begin, four participants were selected to function as recruiter “seeds,” two from a popular

Boston public sex environment and two others via a partner-seeking internet website. To efficiently recruit a sufficiently large sample, 29 additional seeds were selected through the course of the study from partner-seeking websites, FCH referrals, and community outreach. Seeds were evaluated for their commitment to the goals of the study and motivation to recruit up to three eligible peers within their social network, who in turn were asked to recruit a subsequent wave of up to three participants, and so on, until the target sample size had been reached. Participants were compensated 25 dollars for their participation in the study, as well as 20 dollars for each eligible participant they recruited (up to three) who subsequently completed a study survey.

Measures

Demographic, sexual behavior/sexual partner history, sexually transmitted infection (STI) history, and drug use questions were adapted from the Centers for Disease Control and Prevention's HIV Behavioral Surveillance Survey, MSM cycle.¹⁵ Participants were also asked about awareness and use of PrEP and nPEP, as well as the likelihood of using PrEP in the future and the acceptability of side effects. Participants were asked about specific hypothetical scenarios to examine under which conditions participants were more likely to use PrEP; these questions were adapted from prior studies of nPEP conducted at FCH.¹⁶

The CAGE questionnaire, a clinical screening instrument for alcoholism (Cronbach's alpha=0.69), was used to assess alcohol use where a score of two or more indicated a problem with alcohol.¹⁷⁻¹⁹

Depressive symptoms were assessed with the Center for Epidemiologic Studies Depression Scale (CES-D), a validated survey of clinically significant distress as a marker for clinical depression (coefficient alpha=0.90; Cronbach's alpha=0.89).²⁰ The 20 items were scored on a 4-point Likert scale from 0 to 3, with a score of 16 or greater indicative of depressive symptoms.

The HIV Optimism/Skepticism scale was used to assess participant attitudes towards current HIV treatments, with lower scores indicating greater optimism due to the way we scaled this measure (Cronbach's alpha=0.79).²¹

Primary Outcome of Interest

During the informed consent process and again prior to beginning the survey, participants were educated about PrEP. Specifically, participants were read the following information: "PrEP stands for 'Pre-Exposure Prophylaxis', the use of any medicine to prevent a disease before exposure to that disease, such as taking medication before traveling to certain countries to prevent malaria. This term most commonly refers to the use of antiretroviral treatments by people at high risk of exposure to HIV, in an attempt to prevent HIV infection. Consequently, for this survey, we define PrEP as the use of any medication taken **before** having sex as protection against HIV infection."

The survey collected data on PrEP use history and measured intentions to use PrEP as a proximal predictor of subsequent behavior.⁹ Participants were asked to rate the degree to which they were likely to use PrEP in the future to prevent HIV infection using the following question: "If PrEP were available, how likely would you be to use it to prevent HIV infection?" Participants were asked to rate their intention on a ten-point scale: 1 (extremely unlikely) to 10 (extremely likely). Specifically, these data were broken down as follows: 1 (N=7); 2 (N=4); 3 (N=5); 4 (N=4); 5 (N=14); 6 (N=8); 7 (N=16); 8 (N=22); 9 (N=15); and 10 (N=132). Data were coded as 'yes' on this outcome if they reported a likelihood scale score of 8 or more (i.e., "likely", "very likely", and "extremely likely"); data were coded as 'no' on this outcome if

they reported a scale score of 7 (“somewhat likely”) or lower. This was done to provide a conservative estimate of PrEP use intentions.

Data Analysis

For the present paper, SAS version 9.1 (Cary, NC) statistical software was used to perform each analysis, where statistical significance was determined at the $p < 0.05$ level. The distribution and range of each variable, including demographics, by intent (yes/no) to use PrEP in the future was assessed. Chi-square global tests of independence were used to test independent associations between variables. Bivariate logistic regression procedures were conducted to assess the association of having heard of PrEP (i.e., awareness, yes/no) with other variables.

Analysis of intentions to use PrEP—For all variables, bivariate logistic regression analyses were conducted to establish which variables resulted in statistically significant parameter estimates. Multivariable logistic regression analysis was performed to determine the relationship between multiple predictors and intention to use PrEP. Variables with a p -value of < 0.10 in the bivariate models were retained in the final multivariable model.²² The final multivariable model controlled for age and race/ethnicity regardless of their significance in the bivariate models. Because there were multiple indicators of sexual risk-taking (e.g., number of male partners, number of anonymous male partners, number of male partners met via the Internet, and STI history) in this analysis, multicollinearity among these variables was assessed; intercorrelation among the independents above .80 were considered to be problematic. For significant bivariate predictors that were multicollinear with each other, the variable thought to be theoretically most important in the analysis was chosen and retained in the final multivariable model, whereas the others were dropped.²²

Results

Demographics

Participant demographics, stratified by PrEP use intentions are depicted in Table 1. Participants ranged in age from 18 to 60 years (mean = 40.8, SD = 9.1), with 46% of the men being White, 44% Black/African American, 1% American Indian, and 9% identifying as “Other” (e.g. Portuguese/Brazilian, multi-racial). Ten percent were Hispanic/Latino and 7% were born outside of the U.S. Fifty-three percent of the sample had a high school education or less and almost half of the sample (44%) reported an annual income of $< \$12,000$. Sixty-eight percent received health insurance coverage through MassHealth, a state-subsidized health insurance plan, 19% were covered through private insurance, and 10% reported no insurance coverage. Regarding sexual identity, 41% of participants described themselves as homosexual/gay, 40% bisexual, 2% heterosexual/straight, and 16% other (e.g., queer, prefer not to say, do not know), though all participants reported anal sex with at least one other man in the 12 months prior to study enrollment.

Sexual Risk Taking

In the past 12 months, participants reported having had oral or anal (insertive or receptive) sex with an average of 21 male sexual partners (SD = 60), 19% of whom were known to be HIV-infected; over half (52%) of participants reported having had oral, anal, or vaginal sex with an average of 3 female sexual partners (SD = 14.8). The majority of the sample reported unprotected insertive anal (76%) and receptive anal (75%) sex with at least one non-monogamous male partner in the past 12 months.

Substance and Alcohol Use

In the preceding 12 months, MSM reported having sex while using a variety of substances. The most prevalent were: alcohol (71%), marijuana (59%), cocaine (56%), poppers (25%), ecstasy (17%), and crystal methamphetamine (14%). Fifty-three percent of the sample had a problem with alcohol as measured by the CAGE screening instrument. Participants who reported using poppers were more likely to engage in unprotected anal sex (OR=3.3; p=0.05).

PrEP and nPEP Awareness and Use

Overall, only one participant reported prior PrEP use (he obtained medication from his HIV-infected brother), five (2.2%) reported that they knew a friend or sexual partner who had used PrEP and 43 (19%) had previously heard of PrEP. Participants reported learning of PrEP from a variety of sources; the most common included through involvement/participation with HIV prevention research or community outreach/education (44%), the media (21%), friends (14%), and medical providers (14%).

Statistically significant variables associated with having heard of PrEP included: prior nPEP use (OR=12.0; p=0.004); engaging in unprotected anal sex with a non-monogamous male partner in the past 12-months (OR=3.5; p=0.02); using crystal methamphetamine during sex in the past 12-months (OR=2.5; p=0.02); meeting sexual partners on the Internet in the past 12-months (OR=3.4; p=0.0004), higher educational attainment (\geq college degree compared to \leq junior high school; OR=2.5; p=0.001); and higher annual income ($>$ \$60K) compared to the lowest income category ($<$ \$6K) (OR=16.3; p=0.009).

A larger percent of the men (28%) reported that they had previously heard of nPEP. The most common sources included through involvement/participation with HIV prevention research or community outreach/education (27%), medical providers (27%), the media (22%), and friends (20%). Only 3.1% of the respondents reported having used nPEP in the past after a high-risk HIV exposure.

Bivariate and Multivariable Logistic Regression Analysis on Predictors of Future PrEP Use Intentions

Overall, 74% of the sample reported a willingness to use PrEP in the future after being educated about its potential for HIV protection. In bivariate analyses, statistically significant variables that predicted possible future PrEP use included less education (\leq junior high school compared to \geq college degree; OR=10.6; p=0.02), moderate income (annual income of \$24K to \$29,999K) compared to the lowest income category ($<$ \$6K) (OR=5.7; p=0.05), not having previously heard of PrEP prior to study enrollment (OR=2.0; p=0.05), access to free PrEP (OR=3.7; p=0.02), no perceived side effects from taking PrEP (OR=3.0; p=0.006), \leq 10 male sex partners in the 12 months prior to study enrollment (OR=2.6; p=0.002), \leq 10 *anonymous* male sex partners in the 12 months prior to study enrollment (OR=2.6; p=0.007), not meeting sexual partners on the Internet via partner seeking web sites (OR=2.0; p=0.03), identifying as a “bare-backer” (i.e., engaging in anal sex without a condom) (OR=1.9; p=0.06), no STI history (i.e., prior to study enrollment the participant had never been diagnosed with an STI by a healthcare provider) (OR=1.8; p=0.06), marijuana use during sex in the 12 months prior to study enrollment (OR=2.2; p=0.01), and being less optimistic about HIV management (OR=.94; p=0.05) (see Table 2).

In a multivariable model adjusting for age and race/ethnicity, significant unique predictors of possible future PrEP use included: less education (OR=7.7; p=0.04), moderate income (OR=13.0; p=0.04), no side effects from taking PrEP (OR=3.5; p=0.001), and not having to pay for PrEP (OR=4.2; p=0.05). The reference group for this analysis is comprised of individuals who had no intention to use PrEP in the future (see Table 2).

Hypothetical Situations Which Participants are Willing to Use PrEP in the Future

Overall, participants reported high willingness to use PrEP under prescribed situations (Table 3): 86% reported that they would be more likely use PrEP every day if they thought it worked to prevent HIV-infection; 85% reported that they would willing to take PrEP before a 'hot' date and then for 28 days after a risky encounter; 89% reported that they would be willing to take PrEP for all unprotected anal sex. Eighty-eight percent would be willing to take PrEP if it meant taking more than one pill, and 86% would be willing to take PrEP even if it had to be taken more than once a day. All scenarios were predicated under the condition that PrEP use prevented HIV-infection.

Discussion

Although clinical trials of PrEP to prevent HIV transmission among MSM are underway,⁶ the use of antiretroviral therapy (ART) for HIV prevention was unfamiliar in this high risk sample, yet the potential for rapid uptake of PrEP seemed highly feasible. Among this diverse sample of New England MSM, many (74%) indicated an interest in using PrEP after learning about its potential, particularly if they could obtain PrEP at no expense and if no side effects were associated with using PrEP. Corroborating findings from a study examining acceptability of PrEP use among California MSM,⁸ the current study found that MSM with lower educational attainment and those who knew less about PrEP and antiretroviral therapy to start with were more open to using ART for prevention once they had some information that suggested its potential as a useful intervention. More concerning, while nPEP has been recommended after high risk exposures to prevent HIV transmission for more than a decade²³ and clinical experience with nPEP in high risk MSM is extensive^{3,4,16} the current study found that knowledge of, and experience with, nPEP was uncommon, albeit more known to MSM than PrEP.

The findings of infrequent PrEP and nPEP knowledge and use are similar to observations in other studies among MSM, though lower than one study which found 5% prior PrEP use.^{8, 24-26} This suggests that programs of community education are important to optimize appropriate nPEP use, and may be important if future PrEP trials indicate that antiretroviral chemoprophylaxis is effective in decreasing HIV transmission. Significantly, 35% of the MSM who had heard of PrEP reported their source of information was the media or friends, suggesting that careful and accurate reporting on the outcomes of future PrEP safety and efficacy trials is necessary to ensure proper use and understanding among MSM, particularly if PrEP studies show partial efficacy, since behavioral risk compensation could obviate modest protective benefits from these medicines. Concerns have been raised that the behavioral disinhibition associated with widespread availability of PrEP could lead to lower perceptions of risk and reduced motivations to engage in risk reduction, similar to concerns that perceptions of treatment efficacy ("therapeutic optimism") have enhanced recent evidence of increased HIV transmission among MSM.²⁷ In the current study, having heard of PrEP was independently associated with prior nPEP use, unprotected anal sex, crystal methamphetamine use during sex, meeting sexual partners on the Internet, higher education, and higher annual income. Yet although riskier and more affluent MSM were more likely to have ever heard of PrEP, PrEP use remained rare among this sample of New England MSM, which could reflect perceptions that antiretroviral use was associated with more potential harms than benefits. Importantly, these same variables did not predict intent to use PrEP in the future. Intentions to use PrEP in the future were not associated with behavioral risk factors (i.e., unprotected sex or drug use), but instead with less education, moderate income, no side effects from taking PrEP, and not having to pay for PrEP. Thus, if PrEP efficacy is demonstrated, community educational messages will need to be carefully tailored to present all relevant data in an easily accessible manner for MSM of diverse educational and demographic backgrounds.

In assessing willingness to use PrEP in hypothetical situations in the future, the current study found having to take more than one pill for each dose or having to take more than one dose per day were associated with modest decrease in MSM's willingness to use, and the majority still found less convenient regimens acceptable if proven to be well-tolerated and effective. This finding has implications for ensuring adherence to PrEP regimens among MSM in the future.

The present study's limitations include possible bias from socially desirable answers since the survey was interviewer administered. In contrast to traditional RDS, this study did not weight the final sample according to the population being studied, so that inferences about the prevalence of specific conditions in the population could not be assessed. This is because once we achieved our a priori determined sample size we stopped enrollment, which did not allow for recruitment chains to continue and hence interrupted the potential future state of equilibrium. As with other non-probability sampling methods, modified RDS is subject to potential biases and reduced generalizability of the study findings to the wider-MSM population. With regard to recruitment, the non-random selection of initial recruits meant that the origination of seeds could subsequently affect the characteristics of recruits. Finally, although predictors of actual PrEP use could not be assessed, analyses that evaluated intentions to use PrEP in the future is supported by the Theory of Reasoned Action/Planned Behavior,⁹ which has shown that intentions are a proximal predictor of a given health behavior. Moreover, the utility of this theory in predicting HIV prophylactic behavior (i.e., condom use intentions and other HIV risk taking behaviors) has been validated among a variety of populations, including MSM.²⁸⁻³¹

These findings suggest that investigators, public health officials, and the media need to be very careful to plan programs of community education that accurately reflect the results from ongoing and future PrEP efficacy trials, and to anticipate how several key variables, including efficacy, side effect profiles, and cost are explained to at risk populations in order to ensure appropriate PrEP use if studies show partial efficacy.

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Table 1
Demographics by PrEP use intentions

	Whole sample (n=227)	Intending to use PrEP (n=169)	Not intending to use PrEP (n=58)
	% (N)	% (N)	% (N)
Age: Mean (SD)	40.8 (9.1)	40.4 (9.4)	42.0 (8.1)
Depressive symptoms: Mean (SD)	17.71 (13.65)	17.84 (14.09)	17.33 (12.40)
Hispanic/Latino	10.1 (23)	78.3 (18/23)	21.7 (5/23)
Race			
White	46.0 (103)	69.9 (72/103)	30.1 (31/103)
Non-White	54.0 (121)	77.7 (94/121)	22.3 (27/121)
Sexual Identity			
Heterosexual/Straight	2.2 (5)	60.0 (3/5)	40.0 (2/5)
Homosexual/Gay	41.4 (94)	71.3 (67/94)	28.7 (27/94)
Bisexual	40.1 (91)	79.1 (72/91)	20.9 (19/91)
Other	1.8 (4)	50.0 (2/4)	50.0 (2/4)
Prefer not to say	9.3 (21)	76.2 (16/21)	23.8 (5/21)
Don't know	5.3 (12)	75.0 (9/12)	25.0 (3/12)
Education			
≤ Junior high	14.5 (33)	90.9 (30/33)	9.1 (3/33)
Some high school	38.8 (88)	76.1 (67/88)	23.9 (21/88)
High school degree or GED	30.4 (69)	78.3 (54/69)	21.7 (15/69)
≥ College degree	16.3 (37)	48.6 (18/37)	51.4 (19/37)
Annual Income			
< \$6K	29.1 (60)	75.0 (45/60)	25.0 (15/60)
\$6K - \$11,999	19.4 (40)	77.5 (31/40)	22.5 (9/40)
\$12K - \$17,999	13.1 (27)	74.1 (20/27)	25.9 (7/27)
\$18K - \$23,999	9.2 (19)	84.2 (16/19)	15.8 (3/19)
\$24K - \$29,999	8.7 (18)	94.4 (17/18)	5.6 (1/18)
\$30K - \$59,999	14.1 (29)	69.0 (20/29)	31.0 (9/29)
> \$60K	6.3 (13)	30.8 (4/13)	69.2 (9/13)
Healthcare Access			
No insurance	10.1 (23)	82.6 (19/23)	17.4 (4/23)
Private insurance	19.4 (44)	63.6 (28/44)	36.4 (16/44)
Medicaid	15.4 (35)	62.9 (22/35)	37.1 (13/35)
Medicare	12.3 (28)	71.4 (20/28)	28.6 (8/28)
Tricare/Champus	0.4 (1)	0 (0/1)	100 (1/1)
Veterans Admin	7.0 (16)	87.5 (14/16)	12.5 (2/16)
MassHealth	67.8 (154)	76.6 (118/154)	23.4 (36/154)
Awareness of PrEP	18.9 (43)	62.8 (27/43)	37.2 (16/43)
No awareness of PrEP	81.1 (184)	77.2 (142/184)	22.8 (42/184)
If PrEP had side effects			

	Whole sample (n=227)	Intending to use PrEP (n=169)	Not intending to use PrEP (n=58)
Would use	42.5 (96)	62.5 (60/96)	37.5 (36/96)
Would not use	57.5 (130)	83.1 (108/130)	16.9 (22/130)
If PrEP does not cost money			
Would use	94.3 (214)	76.2 (163/214)	23.8 (51/214)
Would not use	5.7 (13)	46.2 (6/13)	53.8 (7/13)
≤ 10 male sex partners in the previous 12-months	69.2 (157)	80.3 (126/157)	19.7 (31/157)
> 10 male sex partners in the previous 12-months	30.4 (69)	60.9 (42/69)	39.1 (27/69)
No previous STI diagnosis	55.1 (125)	77.6 (97/125)	22.4 (28/125)
Previous STI diagnosis	44.9 (102)	70.6 (72/102)	29.4 (30/102)

Table 2
Bivariate and multivariable analysis on predictors of PrEP use intentions (N = 227)

	Odds Ratio (unadjusted)	P-value	Odds Ratio [*] (adjusted)	P-value
Education				
≤ Junior high	10.56	0.01	7.70	0.04
Some high school	3.37	NS	2.46	NS
High school degree or GED	3.80	NS	2.29	NS
≥ College degree	1.00	--	1.00	--
Annual Income				
<\$6K	1.00	--	1.00	--
\$6K – 11,999	1.15	NS	0.97	NS
\$12K – 17,999	0.95	NS	1.26	NS
\$18K – 23,999	1.78	NS	3.32	NS
\$24K – 29,999	5.67	0.05	13.03	0.04
\$30K – 59,999	0.74	NS	2.02	NS
>\$60K	0.15	0.0005	0.76	NS
Awareness of PrEP	1.00	--	1.00	--
No awareness of PrEP	2.00	0.05	1.88	NS
No PrEP side effects	2.95	0.006	3.53	0.0013
PrEP side effects	1.00	--	1.00	--
PrEP does not cost money	3.73	0.02	4.21	0.05
PrEP does cost money	1.00	--	1.00	--
≤ 10 male sex partners in the previous 12-months	2.63	0.002	--	--
> 10 male sex partners in the previous 12-months	1.00	--	--	--
≤ 10 anonymous male sex partners in the previous 12-months	2.56	0.007	--	--
> 10 anonymous male sex partners in the previous 12-months	1.00	--	--	--
Not meeting sexual partners on the Internet	2.00	0.03	--	--
Meeting sexual partners on the Internet	1.00	--	--	--
Identifies as a “barebacker”	1.92	0.06	1.39	NS
Does not identify as a “barebacker”	1.00	--	1.00	--
No previous STI diagnosis	1.81	0.06	1.13	NS
Previous STI diagnosis	1.00	--	1.00	--
Marijuana use during sex in the previous 12-months	2.18	0.01	1.85	NS
No Marijuana use	1.00	--	1.00	--
Being less optimistic about HIV management (continuous, higher scores reflecting lower optimism)	0.94	0.05	0.96	NS

* Final multivariable logistic regression model controlled for age and race/ethnicity.

The following variables were not statistically significant in the bivariate models for PrEP use intention and are not shown in the table: age; race/ethnicity; health care coverage; sexual orientation; depressive symptoms (CES-D); history of nPEP use; alcohol dependence (CAGE questionnaire); substance use

during sex in the past 12-months, including poppers, ecstasy, gamma hydroxybutyrate (GHB), cocaine, ketamine, or crystal methamphetamine; unprotected and serodiscordant unprotected anal sex in the past 12-months; total number of male or female sexual partners; number of people participant knows who have HIV; and number of close friends with HIV.

Table 3
Willingness to take PrEP in the future given a specific hypothetical situation compared by overall PrEP use acceptability (N = 227)

Overall PrEP use acceptability:	Yes (N = 169)		No (N = 58)	
	Yes (%)	No (%)	Yes (%)	No (%)
Be more likely to use it every day if you thought it worked? **	89.8	10.2	74.5	25.5
Take it before a hot date, and be willing to take it daily for 28 days after a risky encounter? ***	89.6	10.4	69.8	30.2
Use it for all unprotected anal sex? ****	94.0	6.0	73.2	26.8
Take it if it meant taking more than one pill per dose? ****	95.8	4.2	63.0	37.0
Take it if the dose had to be taken more than once a day? ****	92.7	7.3	63.6	36.4

Significance is referred to the Chi-square test of independence examining the relationship between overall PrEP use acceptability and the hypothetical situations under which participants would or would not use PrEP in the future.

All scenarios were predicated under the condition that PrEP use prevented HIV-infection.

* p<.05;

** p<.01;

*** p<.001;

**** p<.0001