ADDRESSING PrEP DISPARITIES AMONG YOUNG GAY AND BISEXUAL MEN IN CALIFORNIA

CHRP
California HIV/AIDS Research Program

SEPTEMBER 2016

AUTHORS

Craig A. Pulsipher, MPP, MSW

Jorge A. Montoya, PhD

Aaron Plant, MPH

Phil Curtis

Ian W. Holloway, MSW, MPH, PhD

Arleen A. Leibowitz, PhD

FUNDERS

This study was funded by the California HIV/AIDS Research Program (Grant Number RP11-APLA-022).

ACKNOWLEDGMENTS

This study was conducted by Sentient Research, Inc., and the California HIV/AIDS Policy Research Center at UCLA/APLA Health, through a generous grant from the University of California HIV/AIDS Research Program. Additional support was provided by the UCLA Center for HIV, Identification, Prevention and Treatment Services (CHIPTS). We would like to express our gratitude to all participants in this study, as well as other researchers who provided critical input into this report. We also thank Vera Valentine for graphic design.

ABOUT THE CALIFORNIA HIV/AIDS RESEARCH PROGRAM

The California HIV/AIDS Research Program fosters outstanding and innovative research that responds to the needs of all people of California, especially those who are often under served, by accelerating progress in prevention, education, care, treatment, and a cure for HIV/AIDS. The California HIV/AIDS Research Program supports two Collaborative HIV/AIDS Policy Research Centers, for research and policy analysis that addresses critical issues related to HIV/AIDS care and prevention in California. These centers include the University of California, Los Angeles; APLA Health; Los Angeles LGBT Center; University of California, San Francisco; San Francisco AIDS Foundation; and Project Inform.

Pulsipher CA, Montoya JA, Plant A, Curtis P, Holloway IW, Leibowitz AA. Addressing PrEP Disparities among Young Gay and Bisexual Men in California. September 2016.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

INTRODUCTION

Young gay, bisexual, and other men who have sex with men (YMSM), particularly black and Latino YMSM, are at highest risk for HIV in California and across the United States. The Centers for Disease Control and Prevention estimates that if current rates persist, half of all black—and a quarter of all Latino—gay and bisexual men could be infected with HIV in their lifetimes.

Pre-exposure prophylaxis (PrEP) is a highly effective HIV prevention intervention that could drastically reduce the number of new HIV infections among YMSM. PrEP uses a well-established antiretroviral medication, Truvada, to block HIV infection in at-risk HIV-negative individuals. When taken as prescribed, Truvada is proven to be over 90 percent effective at preventing HIV.

Recent studies have shown PrEP awareness and uptake to be low among at-risk populations in California and across the United States for a number of reasons, including concerns about side effects, perceived high cost, limited access, and PrEP-related stigma. If barriers to PrEP use among YMSM are not addressed, the benefits of this HIV prevention strategy will not be fully realized.

METHODS

An online survey was conducted from July 9, 2015 through August 20, 2015 to examine current levels of PrEP awareness and use, likelihood of use, as well as various attitudes and perceived barriers to PrEP uptake among YMSM in California. YMSM were recruited through banner ads on several popular "hook-up" apps and websites. Individuals were eligible if they were HIV-negative, a California resident, 18–29 years of age, identified as a biological male, and indicated that the gender of their sex partners included males. Given the disproportionate impact of HIV among black and Latino YMSM, this study focused specifically on outcomes for these groups in comparison to their white counterparts. Differences among 18–21 year olds, 22–25 year olds, and 26–29 year olds were also assessed.

SAMPLE

The final analytic sample included 602 YMSM. Most identified as Latino (40.4%), followed by black (32.2%), and white (27.4%). In terms of age, a plurality were 22–25 years old (41.5%), followed by 18–21 years old (29.9%) and 26–29 years old (28.6%). The overwhelming majority of respondents indicated their sexual orientation as gay (83.2%) followed by bisexual (14.8%). The majority of respondents (97.8%) identified as male with the remainder indicating another gender identity. The majority reported a modest income of $60,000 or less (73.1%) in the last year with few reporting an income of $60,000 or more (12.1%).

RESULTS

About 1 in 10 respondents reported having used PrEP (9.6%). The majority (90.3%) of respondents were PrEP naïve, never having used PrEP. PrEP use was significantly higher among white respondents (13.9%) compared to Latino respondents (6.6%). PrEP use among black respondents was 9.8%, though not significantly different from white and Latino respondents. PrEP use was significantly higher among 22–25 year olds (14.0%) and 26–29 year olds (9.3%) compared to PrEP use among 18–21 year olds (3.9%). PrEP use was significantly higher among respondents with annual incomes of $30,000 or higher (13.0%) compared to PrEP use among respondents with annual incomes of $29,000 or less (9.9%).

Nearly three-quarters (73.0%) of PrEP naïve respondents were aware of PrEP. PrEP awareness was significantly higher among respondents identifying as white (87.3%) compared to black (62.9%) and Latino (71.8%) respondents. PrEP awareness was significantly lower among 18–21 year olds (59.0%) in comparison to 22–25 year olds (78.1%) and 26–29 year olds (81.4%). PrEP awareness was significantly higher among gay-identified respondents (77.5%) compared to bisexual identified respondents (52.3%). Similarly, a significantly greater percentage of respondents whose sex partners were only men (75.8%) were aware of PrEP compared to respondents with both men and women as sex partners (60.2%).

Sources of PrEP Awareness and Perceived PrEP Knowledge

PrEP naïve respondents who were aware of PrEP (n=397) had primarily heard about PrEP through sources other than their medical providers. These included social media (56.7%), online or the Internet (49.4%), and friends (46.6%) with about a quarter mentioning sex partners (25.9%), LGBT community organizations (25.4%), and HIV/AIDS organizations (25.2%) as other sources. The majority indicated they did not have enough information to make a decision about using PrEP (70.5%) and did not know where to get PrEP if they wanted to start taking it (61.0%), with Latinos being significantly more likely to indicate lack of knowledge in comparison to white respondents.

Likelihood of Taking PrEP among PrEP Naïve Respondents

PrEP naïve respondents (n=544) were asked to consider some information about PrEP that included facts about the medication, the purpose of the medication, efficacy, dosage, side effects, and required medical follow-ups. Respondents were then asked to indicate their likelihood of taking PrEP if it were made available to them. The majority of respondents provided ratings of *extremely likely* and *very likely* (55.9%) with significantly more Latinos (63.4%) providing these ratings compared to whites (49.3%). Over half of black respondents provided ratings of *extremely likely* and *very likely* (51.4%), though not significantly different from white or Latino respondents.

PrEP Attitudes and Perceived Barriers Among PrEP Naïve Respondents

PrEP naïve respondents were asked to provide agreement ratings for a series of statements related to general attitudes and beliefs about PrEP as well as barriers to PrEP use. Significant racial/ethnic and age group differences are highlighted below.

General Attitudes and Beliefs—The majority of respondents agreed that PrEP use should be encouraged (88.6%) and that taking PrEP would be a good way to protect them from getting HIV (89.7%). However, black respondents were significantly less likely than white respondents to agree that taking PrEP would be a good way to protect them from getting HIV.

Access Issues— Less than a third of respondents agreed that they wouldn't be able to take PrEP because they don't have health insurance (30.1%) or don't know how to enroll in health insurance (31.5%). However, black and Latino YMSM were significantly more likely to agree with these statements than whites. In addition, the majority of respondents agreed that they did not know where to go to get PrEP (59.3%) or how to find a doctor who could give them a PrEP prescription (56.4%), with black and Latino YMSM being significantly more likely to agree with these statements than white YMSM.

Concerns About Cost—The majority (58.9%) of respondents agreed that they would not be able to afford PrEP, with significantly more Latinos agreeing with this statement in comparison to black respondents.

Efficacy Beliefs—The majority (58.4%) of respondents agreed that they were concerned that PrEP is only partially effective.

Provider Comfort and Medical Mistrust—Roughly a third of participants (35.5%) agreed that they did not trust drug companies, with 26–29 year olds being significantly more likely to agree with this statement than 18–21 year olds. Few respondents (14.2%) agreed that they did not trust doctors or healthcare providers. There were no significant racial/ethnic differences with regard to these statements.

Concerns About Side Effects—The majority (63.4%) of respondents agreed that they were concerned about side effects or feeling sick from taking PrEP.

Stigma and Social Norms—The majority of respondents disagreed that they would be concerned about family (55.0%), friends (72.7%), or sex partners (76.9%) finding out if they were to begin taking PrEP. However, 18–21 year olds were significantly more likely to agree that they would be concerned about family members finding out if they were to begin taking PrEP than 22–25 year olds and 26–29 year olds. Black and Latino respondents were significantly more likely to agree that they were concerned about sex partners finding out than whites.

Sexual Risk Concerns—The majority (70.5%) of respondents disagreed that they would use condoms less if they were to begin taking PrEP. The majority (64.4%) of respondents agreed that they think people who use PrEP take more sexual risks.

RECOMMENDATIONS

1. Targeted education campaigns and interventions are needed to increase PrEP awareness and uptake, especially among black and Latino, low-income, and non-gay identified YMSM.

Our study results showed high levels of PrEP awareness among YMSM in California, but we found significant racial/ethnic and age disparities that demonstrate the need for targeted education campaigns to increase PrEP awareness among YMSM of color, particularly those who are younger. PrEP education and outreach efforts must also be mindful of the specific needs of non-gay identified YMSM as well as men who have sex with men and women. Just under 10% of YMSM in this study had ever used PrEP and younger, low-income, YMSM of color were less likely to be early adopters of PrEP. Given the array of social and structural barriers that may prevent these communities from accessing PrEP (e.g., discrimination, family rejection, lack of stable housing, unemployment, prohibitive immigration policies), targeted strategies are needed to increase PrEP uptake that take these barriers into account.

2. Culturally responsive and linguistically appropriate interventions are needed to increase PrEP uptake among YMSM, particularly Latino YMSM.

The majority of YMSM in this study demonstrated favorable attitudes toward PrEP and indicated a high likelihood of using PrEP if it were made available to them. We found that Latino YMSM were significantly more likely than white YMSM to be interested in taking PrEP if it were available. This finding is particularly interesting given that Latino respondents who were already aware of PrEP were least likely to have enough information about PrEP and least likely to know where to access PrEP compared to other racial/ethnic groups. Culturally responsive and linguistically appropriate interventions are needed to increase PrEP uptake among this population.

3. PrEP access points must be available throughout the state, particularly in communities of color, and provider directories should be widely publicized.

We found that over half of all PrEP naïve respondents did not know where to go to get a PrEP prescription or how to find a doctor who could give them a PrEP prescription, with black and Latino respondents being more likely to lack this information in comparison to whites. It is vital to ensure that a sufficient number of PrEP access sites are available throughout the state, particularly in highly impacted communities of color. Several California jurisdictions have developed directories that list contact information for local medical providers that offer PrEP (e.g., pleaseprepme.org, getprepla.com). These directories must continue to be updated regularly and widely publicized.

4. PrEP navigation services tailored to the needs of YMSM of color are essential, and must include screening for and enrollment in health coverage.

Our study results showed that black and Latino YMSM were more likely than whites to agree that lack of health insurance could be barrier to PrEP use. The Affordable Care Act has greatly reduced the number of uninsured individuals in California. In 2015, however, 1 in 4 of the state's remaining uninsured was between the age of 25 and 34, and more than half were Latino.10 California recently funded several community-based organizations to provide PrEP navigation services, which will identify individuals interested in PrEP, conduct financial screenings and insurance enrollment, and refer qualified individuals to a PrEP-friendly medical provider. PrEP navigation services must be accessible throughout the state and programming should be tailored to meet the needs of YMSM of color.

5. PrEP education must provide clear and consistent information on side effects and efficacy.

Regardless of race/ethnicity and age, the majority of YMSM in this sample had concerns about side effects from taking PrEP as well as concerns about PrEP's efficacy. YMSM need clear and consistent messaging with regards to the side effects and efficacy of PrEP so they can make informed decisions about whether or not PrEP is appropriate for them.

6. California should use public funds to help pay for PrEP, including PrEP-related clinical ancillary services.

YMSM in this study identified cost as a major barrier to PrEP use. Long-term success of PrEP will require YMSM to have access to PrEP services at low or no cost. Other states, including New York, Washington, and Colorado, have implemented programs to reduce cost-sharing associated with the medication, clinical ancillary services, or both. The California Legislature recently approved the development of a similar PrEP affordability program.

7. California's laws addressing medical confidentiality must be widely publicized, especially for YMSM on another person's health plan.

YMSM ages 18–21 years old were more likely than their older counterparts to be concerned about family members finding out if they were to begin taking PrEP. These results highlight the importance of ensuring confidential access to PrEP for YMSM, particularly those still living with their families or accessing medical care through someone else's insurance. In 2013, California lawmakers enacted the Confidential Health Information Act to address privacy concerns of individuals insured as dependents on a parent's or partner's health plan. YMSM, medical providers, and PrEP navigators must be informed of patient rights regarding confidential health care.

8. Education campaigns should be developed that challenge stereotypical assumptions about who is an appropriate candidate for PrEP.

Regardless of race/ethnicity and age, YMSM in this study believed that PrEP users engage in more sexual risk behaviors. Education campaigns should be developed that challenge these beliefs, as empirical data suggest risk compensation (i.e., reduction in other prevention behaviors, such as condom use, due to reliance on PrEP) among PrEP users is not universal. These education efforts should help normalize PrEP use among YMSM.

9. PrEP outreach and education efforts must follow the market—online.

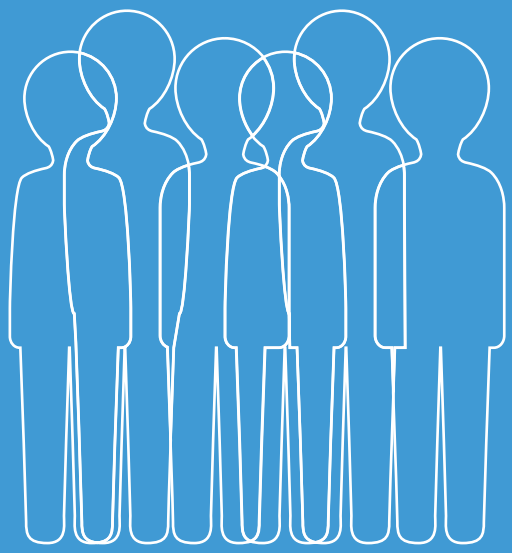
Over half of PrEP naïve respondents learned about PrEP through social media and just less than half indicated receiving information about PrEP online. YMSM social networking apps and websites (e.g., Grindr, Scruff, Jack'd, etc.) are important channels to disseminate information about PrEP. Smartphone apps and websites that include risk assessment tools, health insurance screening, opportunities to chat with a medical provider, and other PrEP-specific features could also help improve PrEP access among YMSM.

10. Provider education is essential to increasing awareness and uptake of PrEP, including encouraging doctors to talk to patients about their sexual behavior.

Few YMSM in this study reported hearing about PrEP from a doctor. Including questions about sexual behavior in clinical settings and prompting their use through electronic health records systems will help identify patients who may be good candidates for PrEP. In addition, for YMSM who do not engage regularly with a medical provider, HIV test counselors and other front line workers should be encouraged to incorporate brief PrEP questions and PrEP referrals into their services.

CONCLUSION

This study offers important insights into PrEP awareness and uptake among YMSM in California. While PrEP awareness and use appear to be increasing among YMSM overall, significant racial/ethnic and age disparities exist. Given the disproportionate impact of HIV among black and Latino YMSM, PrEP implementation efforts must prioritize increasing education and improving access within these communities. This study also identified a number of barriers that may impede PrEP uptake among YMSM including concerns about confidentiality, side-effects, efficacy, and cost. Failure to address the PrEP-related concerns and barriers experienced by YMSM, particularly black and Latino YMSM, will only serve to exacerbate existing health disparities and limit PrEP's ability to achieve a population-level effect on HIV transmission.



“PrEP has changed my life, taking one worry factor out of my sex life has been such a relief, a spiritual awakening in realizing that sex is a positive act, not a sin or a vulgar act people engage in.”

25 year old, Latino gay male

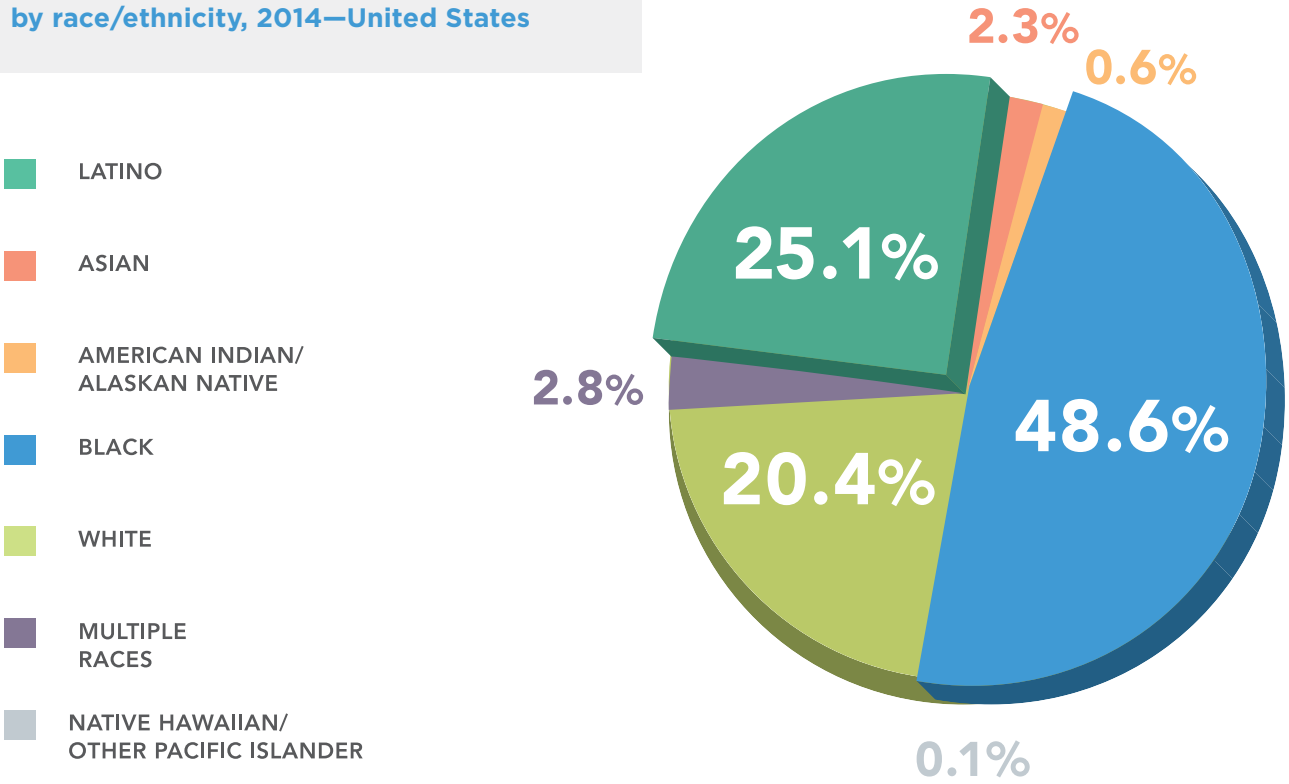
INTRODUCTION

Young gay, bisexual, and other men who have sex with men (YMSM) are at highest risk for HIV in California and across the United States (US). In 2014, roughly 92% of all HIV diagnoses in the US among adolescent males ages 13–24 were attributed to same–sex contact.[1] YMSM are also one of the only risk groups in the US with increasing rates of infection. Between 2002 and 2011, YMSM ages 13–24 experienced a 133% increase in HIV diagnoses.[2]

Racial/ethnic minority YMSM are particularly affected by HIV. Blacks comprised nearly half (48.6%) of 2014 HIV infections among YMSM and Latinos comprised roughly a quarter (25.1%) of new infections, compared to 20.4% for white YMSM (see Figure 1).[1] The Centers for Disease Control and Prevention (CDC) recently estimated that if current HIV diagnoses rates persist, about 1 in 2 black gay and bisexual men and 1 in 4 Latino gay and bisexual men in the US could be diagnosed with HIV during their lifetime.[3] The HIV epidemic in California reflects similar disparities by behavioral risk factors, age, and race/ethnicity as are seen in the nation as a whole.[4]

HIV disparities among YMSM have persisted for decades despite efforts to reduce new infections through HIV testing, condom distribution, behavioral interventions, and treatment of individuals who are HIV-positive.[5] In 2012, the first biomedical intervention was added to the arsenal of HIV prevention strategies with the Food and Drug Administration's (FDA) approval of Truvada for use as pre-exposure prophylaxis (PrEP). PrEP is an HIV prevention strategy in which HIV-negative individuals take a daily medication to reduce their risk of becoming infected with HIV. PrEP is a highly effective intervention that holds the promise of drastically reducing new HIV infections. Clinical

Figure 1.
Percentage of estimated diagnosed HIV infections among YMSM (13–29 years old) by race/ethnicity, 2014—United States



Source: Centers for Disease Control and Prevention. HIV surveillance report, 2014 [Internet]. Atlanta, GA: Centers for Disease Control and Prevention; 2015 [cited 2016 Mar 1]. Available from: http://www.cdc.gov/hiv/library/reports/surveillance/.

trials have reported that with high medication adherence, PrEP reduced new HIV infections by 92% among men who have sex with men (MSM),[6] 90% among heterosexually active men and women,[7] and over 70% among persons who inject drugs.[8] Statistical modeling has also projected that taking Truvada seven days a week reduces the risk of HIV infection by 99%, and up to 96% if taken at least four times per week.[9]

The World Health Organization now recommends that all people at substantial risk of HIV should be offered PrEP.[10] PrEP is also a key component of the National HIV/AIDS Strategy which calls for universal access to PrEP for individuals at risk of HIV infection.[11] The CDC recently estimated that reaching national targets for HIV testing and treatment and scaling up use of PrEP could reduce new HIV infections in the US by as much as 70% by 2020.[12] Increasing awareness and use of PrEP, particularly among YMSM of color, is an important public health goal.

Numerous studies have been conducted examining awareness, intention to use, and actual use of PrEP among multiple samples of MSM in the US before and after the FDA's approval of Truvada.[13-25] PrEP awareness has generally increased across study samples from 2006 through 2015 ranging from as little as 12.5% to as much as 86%. Self-reported intention or likelihood of using PrEP has generally been higher than PrEP awareness, ranging in studies from 39.3% to as much as 81%. Actual PrEP use among MSM in these studies has been virtually non-existent (2% or less in most studies), but studies conducted in 2015 have demonstrated that PrEP use is increasing among MSM in some jurisdcitions.[16, 19, 25] Additional research is needed to better understand PrEP awareness, intention to use, and actual use among YMSM, especially YMSM of color.

While YMSM have generally expressed interest in using PrEP, recent studies have identified a number of barriers that may prevent YMSM from accessing this prevention strategy.[14, 15, 26-28] These barriers include low awareness, concerns about side effects, misconceptions and mistrust regarding PrEP, perceived high cost, lack of access to comprehensive health insurance, and PrEP-related stigma. Given the disproportionate impact of HIV among YMSM, it remains vital to better understand their concerns and eliminate barriers that may impede PrEP uptake. Further, failure to address the specific concerns of vulnerable black and Latino YMSM may exacerbate existing disparities within these communities. Thus, this study sought to examine current levels of PrEP awareness and use, likelihood of use, as well as attitudes and barriers to PrEP uptake among YMSM in California, with a particular focus on highly-impacted YMSM of color.

METHODS

An online survey was conducted from July 9, 2015 through August 20, 2015 to examine current levels of PrEP awareness and use, likelihood of use, as well as various attitudes and perceived barriers to PrEP uptake among YMSM in California. Perceived barriers that were measured included accessibility, concerns about cost, efficacy beliefs, provider comfort and medical mistrust, concerns about side effects, stigma and social norms, sexual risk concerns, as well as various attitudes and beliefs about PrEP. Associations of demographics, sexual risk behaviors, healthcare access, awareness, use, and likelihood of using PrEP were also assessed.

YMSM were recruited through banner ads on several popular "hook-up" apps and websites. Individuals were eligible to complete the survey if they were HIV-negative, a California resident, 18 through 29 years of age, identified as a biological male, and indicated that the gender of their sex partners included males. Given the disproportionate impact of HIV among black and Latino YMSM, this study focused specifically on outcomes for these groups in comparison to their white counterparts. The number of respondents for other ethnic groups was too small to draw any reliable conclusions; consequently these groups were excluded from the final analysis. Differences among 18–21 year olds, 22–25 year olds, and 26–29 year olds were also assessed.

Descriptive statistics were conducted using frequency distributions and measures of central tendency. Pearson chi-square tests were utilized for bivariate comparisons followed by post hoc chi-square tests for comparisons where one or more variables had three or more response categories. Binary logistic regressions were utilized for multivariate analysis of outcomes with two or more predictors with the inclusion of odds ratios and 95% confidence intervals for each model.

SAMPLE

A total of 3,868 responses to the survey were recorded. Of these, 1,254 individuals were excluded because they did not meet the eligibility criteria and 419 were identified as duplicate responses. Of the remaining 2,195 responses, 19 individuals did not provide informed consent, 1,497 did not complete the screener, and 77 did not complete the entire survey. This resulted in a final analytic sample of 602 YMSM. A plurality of respondents identified as Latino (40.4%), followed by black (32.2%), and white (27.4%) (Table 1). The age of respondents was well distributed across three age groups from 18–29 years of age, with a plurality being 22–25 years of age (41.5%), followed by 18–21 years (29.9%) and 26–29 years (28.6%). The overwhelming majority of respondents indicated their sexual orientation as gay (83.2%) followed by bisexual (14.8%) and a majority also indicated sex with men only (82.6%) with the remaining indicating sex with both men and women (17.4%). The majority of respondents (97.8%) identified as male with the remainder indicating another gender identity. The majority reported a modest income of $60,000 or less (73.1%) in the last year with few reporting an income of $60,000 or more (12.1%). A plurality of respondents resided in the Los Angeles region (45.7%) with the next largest portion residing in the Bay Area (23.1%) followed by the Inland Empire (11.1%), Central Valley (7.8%), and San Diego/ Imperial (6.5%) regions. Relatively few respondents in our sample resided in the Central Coast (1.8%) and Northern California (1.2%) regions. A plurality of respondents indicated full-time employment (43.3%) followed by others indicating part-time employment (25.4%), full-time student (21.8%), and unemployed (9.5%).

TABLE 1. **Sample characteristics for all respondents, PrEP experienced respondents, and PrEP naïve respondents.**

		TOTAL SAMPLE	USED/EXPERIENCED	NON-USER/NAÏVE
		(N=602)	(N=58)	(N=544)
		COLUMN %	ROW %	ROW %
ETHNICITY	White	165 (27.4%)	23 (13.9%)	142 (86.1%)
	Black	194 (32.2%)	19 (9.8%)	175 (90.2%)
	Latino	243 (40.4%)	16 (6.6%)	227 (93.4%)
AGE GROUP	18-21	180 (29.9%)	7 (3.9%)	173 (96.1%)
	22-25	250 (41.5 %)	35 (14.0%)	215 (86.0%)
	26-29	172 (28.6%)	16 (9.3%)	156 (90.7%)
SEXUAL IDENTITY	Homosexual/Gay	501 (83.2%)	56 (11.2%)	445 (88.8%)
	Bisexual	89 (14.8%)	1 (1.1%)	88 (98.9%)
	Heterosexual/Straight	3 (0.5%)	0 (0.0%)	3 (100%)
	Other	5 (0.8%)	1 (20.0%)	4 (80.0%)
	Decline	4 (0.7%)	0 (0.0%	4 (100%)
GENDER OF SEX PARTNERS	Men Only	497 (82.6%)	51 (10.3%)	446 (89.7%)
	Men and Women	105 (17.4%)	7 (6.7%)	98 (93.3%)
*INCOME IN LAST YEAR	$29k or less	274 (45.5%)	27 (7.2%)	346 (92.8%)
	$30k to $59k	166 (27.6%)	24 (17.1%)	116 (82.9%)
	$60k or more	73 (12.1%)	7 (15.9%)	37 (84.1%)
REGION	Bay Area	139 (23.1%)	22 (15.8%)	117 (84.2%)
	Central Coast	11 (1.8%)	1 (9.1%)	10 (90.9%)
	Central Valley	47 (7.8%)	3 (6.4%)	44 (93.6%)
	Inland Empire	67 (11.1%)	1 (1.5%)	66 (98.5%)
	Los Angeles	275 (45.7%)	26 (9.5%)	249 (90.5%)
	Northern California	7 (1.2%)	0 (0.0%)	7 (100%)
	San Diego/Imperial	39 (6.5%)	4 (10.3%)	35 (89.7%)
	Not provided	17 (28.2%)	1 (5.9%)	16 (94.1%)
EMPLOYMENT STATUS	Full-time	252 (43.3%)	30 (11.9%)	222 (88.1%)
	Part-time	148 (25.4%)	11 (7.4%)	137 (92.6%)
	Full-time student	127 (21.8%)	8 (6.3%)	119 (93.7%)
	Unemployed	55 (9.5%)	8 (14.5%)	47 (85.5%)
CURRENT GENDER IDENTITY	Male	589 (97.8%)	57 (9.7%)	532 (90.3%)
	Female	4 (0.7%)	0 (0.0%)	4 (100.0%)
	Trans Female/Trans Woman	2 (0.3%)	0 (0.0%)	2 (100.0%)
	Gender Queer/Non-Conforming	4 (0.7%)	1 (25.0%)	3 (75.0%)
	Something Else	2 (0.3%)	0 (0.0%)	2 (100.0%)
	Decline to answer	1 (0.2%)	0 (0.0%)	1 (100.0%)

* "Don't know" and "Decline" responses excluded.

FINDINGS

About 1 in 10 respondents in this study reported having used PrEP (9.6%; 58/602). The majority (90.3%; 544/602) of respondents were PrEP naïve, never having used PrEP. Below we provide a closer examination of PrEP naïve respondents followed by a brief discussion of respondents who had previously used or were currently using PrEP at the time of the survey (PrEP experienced).

PrEP NAÏVE RESPONDENTS

The majority (59.7%) of PrEP naïve respondents indicated having a regular doctor or healthcare provider. When asked how often their doctor asked them about their sexual behavior, a minority (13.8%) said their provider discussed their sexual behavior at every medical visit with the remaining saying this was discussed at *some visits* (30.5%), discussed at *one visit* (24.6%), and *never* discussed (31.1%). However, when asked how comfortable they were about discussing their sexual behavior with their provider, the majority indicated they were *comfortable* and *very comfortable* (61.2%). The majority (72.4%) of PrEP naïve respondents also indicated having health insurance or health coverage with a plurality having employer sponsored private insurance (28.9%) followed by insurance through someone else's employer (26.6%), Medi-Cal or Medicaid (26.6%), private insurance through Covered California (6.1%), private insurance (5.6%), student health insurance (5.6%), Medicare (2.5%), veteran's benefits (1.3%), or some other type of coverage (1.3%). A significantly greater percentage of white respondents indicated having health insurance (84.5%) compared to blacks (65.1%) and Latinos (70.5%). Among those without insurance, less than half (44.7%) had tried to enroll in health coverage and a majority (62.7%) did not know where to go to enroll in health coverage.

In terms of risk behaviors, a large majority (79.2%) of PrEP naïve respondents had multiple sex partners (2 or more partners) in the last 6 months with men in this group averaging 7.3 partners (median = 4.0) in the last 6 months (see Table 2). When asked about condomless receptive anal sex in the last 6 months, about half indicated this occurred 1 or more times (51.5%) with an average of 3.1 times (median=1.0). When asked about their frequency of condom use for anal sex in the last 6 months, about one-third (32.2%) indicated *all of the time* with the remainder indicating *most of the time* (22.2%), *occasionally* (18.9%), *rarely* (17.1%), and *never* (9.6%). When asked about history of sexually transmitted infections (STIs), nearly 2 in 10 (19.5%) PrEP naïve respondents reported being diagnosed with an STI in the past year.

TABLE 2. Risk behaviors among PrEP naïve respondents.

		PrEP Naïve Respondents (N=544) COLUMN %
NUMBER OF SEX PARTNERS IN LAST 6 MONTHS	1 or less	113 (20.8%)
	2 or more	431 (79.2%)
	Mean (Median)	7.3 (4.0)
CONDOMLESS RECEPTIVE ANAL SEX IN LAST 6 MONTHS	0 times	264 (48.5%)
	1 or more times	280 (51.5%)
	Mean (Median)	3.1 (1.0)
FREQUENCY OF CONDOM USE IN THE LAST 6 MONTHS	Never	52 (9.6%)
	Rarely (about 1 out of 4 times)	93 (17.1%)
	Occasionally about half the time)	103 (18.9%)
	Most of the time (about 3/4 times)	121 (22.2%)
	All of the time	175 (32.2%)
STI DIAGNOSIS IN PAST YEAR	Yes	106 (19.5%)
	No	438 (80.5%)
TIME OF LAST STI TEST	Less than 6 months ago	250 (46.0%)
	Between 6 months and 1 year ago	130 (23.9%)
	Between 1 year and 2 years ago	62 (11.4%)
	More than 2 years ago	30 (5.5%)
	Never been tested	72 (13.2%)
TIME OF LAST HIV TEST	Less than 6 months ago	271 (49.8%)
	Between 6 months and 1 year ago	123 (22.6%)
	Between 1 year and 2 years ago	49 (9.0%)
	More than 2 years ago	28 (5.1%)
	Never been tested for HIV	73 (13.4%)

When asked about their last STI test, a plurality indicated testing *less than six months ago* (46.0%), followed by *between six months and one year ago* (23.9%), *between one year and two years ago* (11.4%), *more than 2 years ago* (5.5%), and *never been tested* (13.2%). Similarly, when asked about their last HIV test, a plurality of PrEP naïve respondents indicated testing for HIV *less than 6 months ago* (49.8%), followed by *between 6 months and one year ago* (22.6%), *between one year and two years ago* (9.0%), *more than two years ago* (5.1%), and *never been tested* (13.4%).

PrEP Awareness among PrEP Naïve Respondents

PrEP awareness was assessed by asking PrEP naïve respondents to indicate if they had ever heard of "PrEP or pre-exposure prophylaxis." Nearly three-quarters (73.0%) of PrEP naïve respondents in our study were aware of PrEP. PrEP awareness was significantly higher among respondents identifying as white (87.3%) compared to black (62.9%) and Latino (71.8%) respondents (see Table 3). PrEP awareness was significantly lower among younger respondents ages 18–21 years old (59.0%) in comparison to older 22–25 year olds (78.1%%) and 26–29 year olds (81.4%).

TABLE 3. PrEP awareness by demographics among PrEP naïve respondents.

		UNAWARE (N=147) ROW %	AWARE (N=397) ROW %
ETHNICITY	White	18 (12.7%)	124 (87.3%)
	Black	65 (37.1%)	110 (62.9%)
	Latino	64 (28.2%)	163 (71.8%)
AGE GROUP (MEAN = 23.3)	18–21	71 (41.0%)	102 (59.0%)
	22–25	47 (21.9%)	168 (78.1%)
	26–29	29 (18.6%)	127 (81.4%)
SEXUAL IDENTITY	Homosexual/Gay	100 (22.5%)	345 (77.5%)
	Bisexual	42 (47.7%)	46 (52.3%)
	Heterosexual/Straight	2 (66.7%)	1 (33.3%)
	Other	1 (25.0%)	3 (75.0%)
	Decline	2 (50.0%)	2 (50.0%)
GENDER OF SEX PARTNERS	Men Only	108 (24.2%)	338 (75.8%)
	Men and Women	39 (39.8%)	59 (60.2%)
*INCOME IN LAST YEAR	$29k or less	109 (31.5%)	237 (68.5%)
	$30k to $59k	22 (19.0%)	94 (81.0%)
	$60k or more	2 (5.4%)	35 (94.6%)
REGION	Bay Area	27 (23.1%)	90 (76.9%)
	Central Coast	4 (40.0%)	6 (60.0%)
	Central Valley	11 (25.0%)	33 (75.0%)
	Inland Empire	18 (27.3%)	48 (72.7%)
	Los Angeles	71 (28.5%)	178 (71.5%)
	Northern California	3 (42.9%)	4 (57.1%)
	San Diego/Imperial	6 (17.1%)	29 (82.9%)
	Not provided	7 (43.7%)	9 (56.2%)

* "Don't know" and "Decline" responses excluded.

In terms of sexual orientation, a significantly larger percentage of gay identified respondents (77.5%) were aware of PrEP compared to bisexual identified (52.3%). Similarly, a significantly larger percentage of respondents whose sex partners were men only (75.8%) were aware of PrEP compared to respondents with both men and women as sex partners (60.2%). The percentage of PrEP aware respondents increased as annual income increased from $29,000 or less (68.5%) to $60,000 or more (94.6%). There were no significant regional differences with regard to PrEP awareness.

Factors Related to PrEP Awareness among PrEP Naïve Respondents

The relationship of multiple factors to PrEP awareness among PrEP naïve respondents were examined concurrently to determine the influence of each individually while controlling for the influence of the others (see Table 4). Ethnicity, age, sexual orientation, health insurance coverage, number of sex partners, and condom use were significantly associated with PrEP awareness. The odds of black respondents being aware of PrEP were less than half (0.41 times) of white respondents. The odds of respondents ages 22–25 and 26–29 years old being aware of PrEP were more than two and a half times (2.84 and 2.66 times, respectively) that of respondents ages 18–21 years. The odds of gay identified respondents being aware of PrEP were four and one-half times (4.55 times) that of respondents identifying as bisexual. The odds of respondents with health insurance being aware of PrEP were more than two and one-half times (2.80 times) that of respondents without health insurance. In terms of risk, the odds of respondents with 2 or more sex partners being aware of PrEP were more than twice (2.29 times) that of respondents with one sex partner or less in the last 6 months and the odds of respondents who always use condoms being aware of PrEP were twice (2.12 times) that of respondents who did not always use a condoms in the last 6 months.

TABLE 4. **Assessment of multiple factors for PrEP awareness among PrEP naïve respondents.**

		Predictors of PrEP Awareness Among PrEP Naïve Respondents (N=459) ODDS RATIO (95% CI)
ETHNICITY	White	Ref
	Black	0.41 (0.19 – 0.88)
	Latino	0.72 (0.35 – 1.50)
AGE GROUP	18-21	Ref
	22-25	2.84 (1.54 – 5.24)
	26-29	2.66 (1.34 – 5.28)
SEXUAL ORIENTATION	Bisexual	Ref
	Gay	4.55 (2.46 – 8.43)
INCOME IN LAST YEAR	$29k or less	Ref
	$30k to $59k	1.44 (0.74 – 2.79)
	$60k or more	4.68 (0.89 – 24.56)
REGION	Los Angeles	Ref
	Bay Area	1.36 (0.70 – 2.65)
	Central Coast	0.31 (0.06 – 1.60)
	Central Valley	1.35 (0.53 – 3.45)
	Inland Empire	1.17 (0.54 – 2.50)
	Northern California	0.59 (0.06 – 6.29)
	San Diego/Imperial	1.91 (0.55 – 6.57)
HEALTH INSURANCE COVERAGE	No	Ref
	Yes	2.80 (1.62 – 4.81)
NUMBER OF SEX PARTNERS IN LAST 6 MONTHS	1 or less	Ref
	2 or more	2.29 (1.28 – 4.09)
CONDOM USE FREQUENCY IN LAST 6 MONTHS	Not Always	Ref
	Always	2.12 (1.20 – 3.73)
DOCTOR VISITS IN PAST YEAR	0 times	Ref
	1 time	0.71 (0.31 – 1.65)
	2 ore more times	1.07 (0.50 – 2.28)
EMPLOYMENT STATUS	Full-time	Ref
	Part-time	0.61 (0.32 – 1.16)
	Full-time student	0.82 (0.40 – 1.67)
	Unemployed	1.06 (0.40 – 2.79)

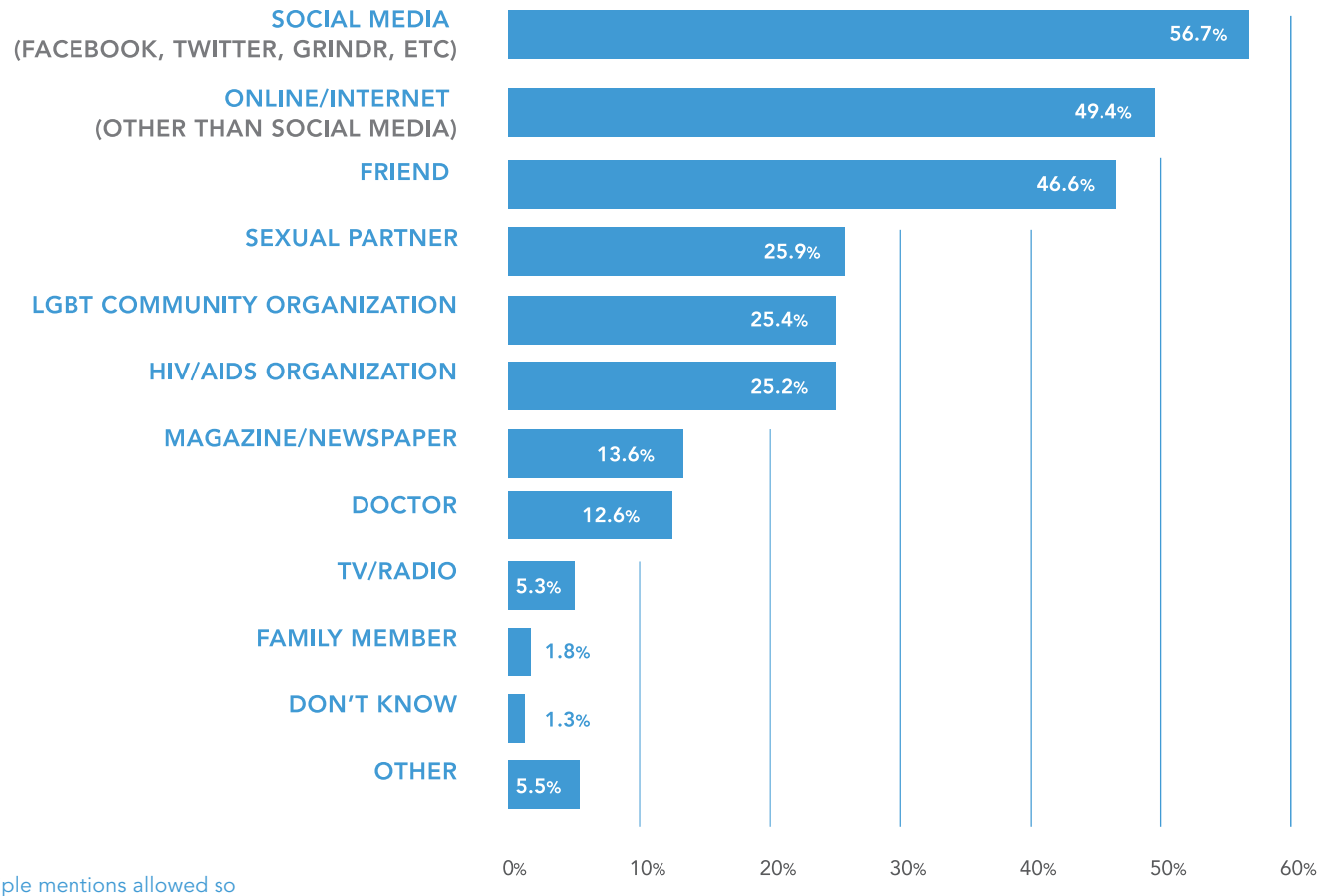
*Values highlighted in blue denote statistically significant associations between a factor and the outcome.

PrEP Naïve Respondents Who Were Aware of PrEP

PrEP naïve respondents who were aware of PrEP (n=397) had primarily heard about PrEP through sources other than their medical providers. These included social media (56.7%), online or the Internet (49.4%), and friends (46.6%) with about a quarter mentioning sex partners (25.9%), LGBT community organizations (25.4%), and HIV/AIDS organizations (25.2%) as other sources (see Figure 2). Fewer mentions as sources of PrEP awareness were made for print media such as newspapers or magazines (13.6%), a doctor (12.6%), television or radio (5.3%), and family members (1.8%).

The large majority (84.9%) of PrEP naïve respondents who were aware of PrEP indicated they had never talked to their doctor or healthcare provider about PrEP. Similarly, when asked if they had enough information about PrEP to make a decision about using it, the majority (70.5%) indicated they did not with a significantly greater percentage of Latinos (77.3%) indicating a lack of information compared to whites (66.1%). And when asked if they would know where to get PrEP if they wanted to start taking it, the majority (61.0%) also indicated they did not with a significantly greater percentage of Latinos (69.3%) not knowing where to get PrEP compared to whites (49.2%). Though not significantly different from whites and Latinos, the majority of black respondents indicated not having enough information about PrEP (65.5%) and not knowing where to get PrEP (61.8%).

Figure 2. Source of PrEP awareness among PrEP naïve respondents who were aware of PrEP (n=397).



*Multiple mentions allowed so percentages may not add to 100%

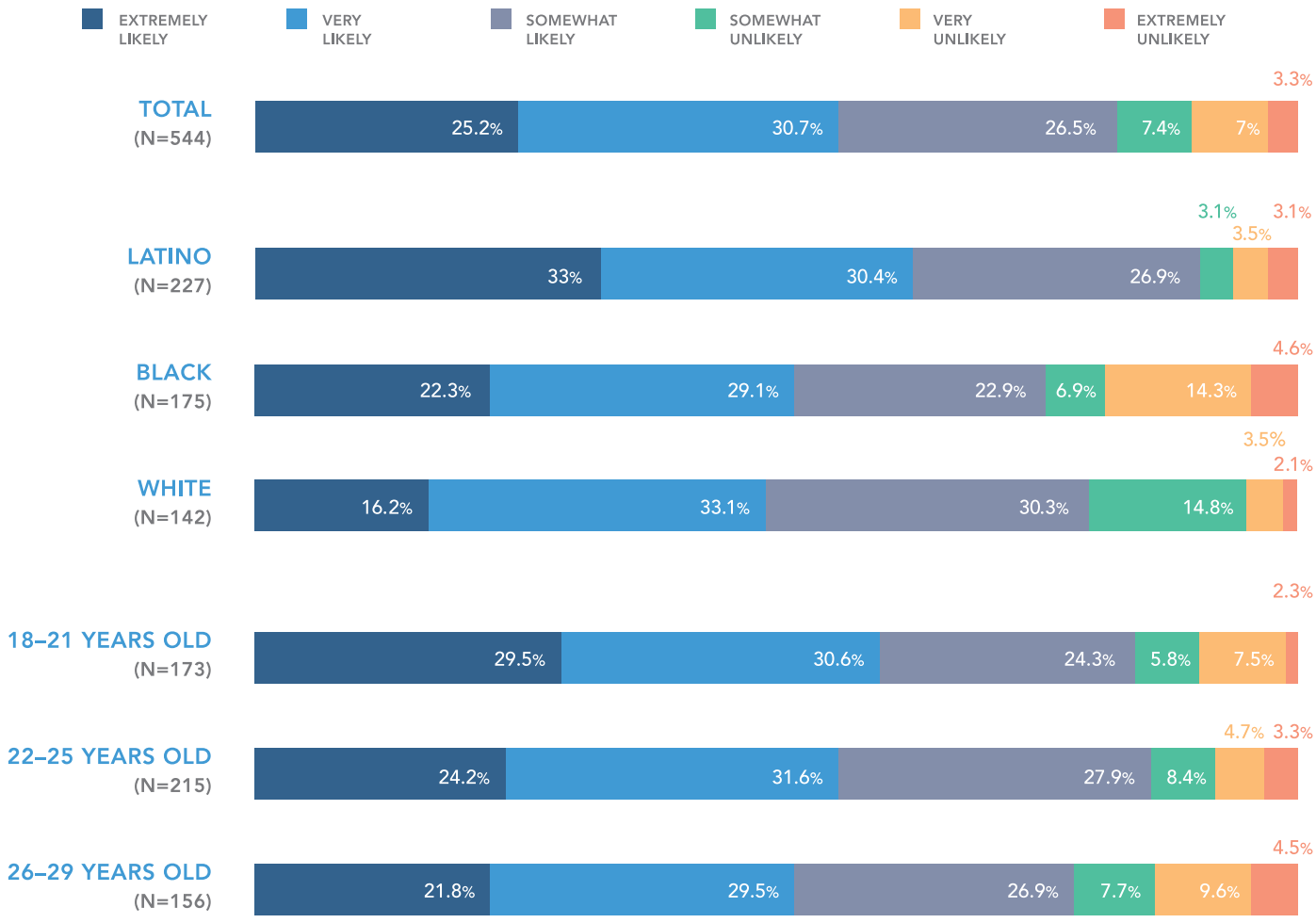
Likelihood of Taking PrEP among PrEP Naïve Respondents

PrEP naïve respondents (n=544) were asked to consider some information about PrEP that included facts about the medication, the purpose of the medication, efficacy, dosage, side effects, and required medical follow-ups (see Panel 1 for specific information provided to respondents). Subsequently, respondents were asked to provide a rating from extremely unlikely to extremely likely on a 6-point scale to indicate the likelihood of taking PrEP if it were made available to them. The majority of respondents provided ratings of *extremely likely* and *very likely* (55.9%) with significantly more Latinos (63.4%) providing these ratings compared to whites (49.3%; see Figure 3). Although not significantly different from whites or Latinos, half of black respondents provided ratings of *extremely likely* and *very likely* (51.4%). There were no significant age group differences for these ratings.

Panel 1.
Information provided to respondents before assessing likelihood of PrEP use.

- PrEP, or pre-exposure prophylaxis, is a way for people who don't have HIV to take a medication in order to lower their risk of getting HIV.
- The medication that is currently used for PrEP is also known as Truvada. It is a combination of two medications that have been used to treat people living with HIV for many years.
- PrEP is extremely effective. When taken every day, PrEP can lower the risk of getting HIV by 92–99%.
- PrEP should be taken every day to be most effective, but it is still very effective even if you occasionally miss a dose.
- Most people who take PrEP don't have any side effects. Some people have minor side effects, such as nausea, headaches, or weight loss, but they usually go away after a few weeks.
- People who take PrEP are required to see a doctor every 2–3 months for follow-up.
- PrEP does not prevent other sexually transmitted diseases (STDs) such as gonorrhea, chlamydia, and syphilis.

Figure 3. Likelihood rating for taking PrEP by race/ethnicity and age groups.



PrEP Attitudes and Perceived Barriers Among PrEP Naïve Respondents

PrEP naïve respondents were asked to provide agreement ratings for a series of statements on a 4-point scale from *strongly disagree* to *strongly agree*. Statements are grouped into separate tables (see Tables 5a through 5h) that represent a family of issues around use of PrEP. These issues include general attitudes and beliefs, access issues, concerns about cost, efficacy beliefs, provider comfort and medical mistrust, concerns about side effects, stigma and social norms, and sexual risk concerns. Significant racial/ethnic and age group differences are denoted for each table.

TABLE 5a. General attitudes and beliefs about PrEP use among PrEP naïve respondents (n=544).

	TOTAL	RACE/ETHNICITY			AGE GROUP		
	PrEP NAÏVE RESPONDENTS (N=544) COLUMN %	WHITE (N=142) COLUMN %	BLACK (N=175) COLUMN %	LATINO (N=227) COLUMN %	18–21 (N=173) COLUMN %	22–25 (N=215) COLUMN %	26–29 (N=156) COLUMN %
Taking PrEP would be a good way to protect myself from getting HIV.[a]							
DISAGREE	56 (10.3%)	9 (6.3%)	26 (14.9%)	21 (9.3%)	18 (10.4%)	21 (9.8%)	17 (10.9%)
AGREE	488 (89.7%)	133 (93.7%)	149 (85.1%)	206 (90.7%)	155 (89.6%)	194 (90.2%)	139 (89.1%)
PrEP would help me worry less about getting HIV.							
DISAGREE	104 (19.2%)	26 (18.4%)	37 (21.3%)	41 (18.1%)	30 (17.5%)	41 (19.1%)	33 (21.3%)
AGREE	437 (80.8%)	115 (81.6%)	137 (78.7%)	185 (81.9%)	141 (82.5%)	174 (80.9%)	122 (78.7%)
PrEP use should be encouraged to prevent the spread of HIV.							
DISAGREE	62 (11.4%)	12 (8.5%)	26 (15.0%)	24 (10.6%)	21 (12.1%)	23 (10.8%)	18 (11.5%)
AGREE	480 (88.6%)	130 (91.5%)	147 (85.0%)	203 (89.4%)	152 (87.9%)	190 (89.2%)	138 (88.5%)

* Ratings of strongly disagree and disagree are collapsed into disagree and ratings of strongly agree and agree are collapsed into agree in this table.

[a] Significant differences between white and black respondents.

The majority (89.7%) of respondents agreed with the statement *Taking PrEP would be a good way to protect myself from getting HIV* (see Table 5a). However, agreement with this statement was significantly lower among blacks (85.1%) in comparison to white respondents (93.7%). The majority of respondents also agreed with the statements *PrEP would help me worry less about getting HIV* (80.8%) and *PrEP use should be encouraged to prevent the spread of HIV* (88.6%).

TABLE 5b. Access issues about PrEP use among PrEP naïve respondents (n=544).

	TOTAL	RACE/ETHNICITY			AGE GROUP		
	PrEP NAÏVE RESPONDENTS (N=544) COLUMN %	WHITE (N=142) COLUMN %	BLACK (N=175) COLUMN %	LATINO (N=227) COLUMN %	18–21 (N=173) COLUMN %	22–25 (N=215) COLUMN %	26–29 (N=156) COLUMN %
I don't know where to get a PrEP prescription. [a, b, c]							
DISAGREE	221 (40.7%)	78 (54.9%)	72 (41.1%)	71 (31.4%)	60 (34.7%)	93 (43.5%)	68 (43.6%)
AGREE	322 (59.3%)	64 (45.1%)	103 (58.9%)	155 (68.6%)	113 (65.3%)	121 (56.5%)	88 (56.4%)
I don't know how to find a doctor who can give me a PrEP prescription [a, c]							
DISAGREE	237 (43.6%)	81 (57.0%)	76 (43.4%)	80 (35.2%)	65 (37.6%)	102 (47.4%)	70 (44.9%)
AGREE	307 (56.4%)	61 (43.0%)	99 (56.6%)	147 (64.8%)	108 (62.4%)	113 (52.6%)	86 (55.1%)
I don't know how to enroll in health insurance so I can start taking PrEP [a, c]							
DISAGREE	372 (68.5%)	118 (83.1%)	111 (63.8%)	143 (63.0%)	112 (65.1%)	154 (71.6%)	106 (67.9%)
AGREE	171 (31.5%)	24 (16.9%)	63 (36.2%)	84 (37.0%)	60 (34.9%)	61 (28.4%)	50 (32.1%)
I wouldn't be able to take PrEP because I don't have health insurance [a, c]							
DISAGREE	380 (69.9%)	114 (80.3%)	115 (65.7%)	151 (66.5%)	120 (69.4%)	157 (73.0%)	103 (66.0%)
AGREE	164 (30.1%)	28 (19.7%)	60 (34.3%)	76 (33.5%)	53 (30.6%)	58 (27.0%)	53 (34.0%)

* Ratings of strongly disagree and disagree are collapsed into disagree and ratings of strongly agree and agree are collapsed into agree in this table.

[a] Significant differences between white and black respondents.

[b] Significant differences between Latino and black respondents.

[c] Significant differences between Latino and white respondents.

The majority of respondents agreed with the statements *I don't know where to go to get a PrEP prescription* (59.3%) and *I don't know how to find a doctor who can give me a PrEP prescription* (56.4%) with a significantly lower percentage of white respondents agreeing with these statements (45.1% and 43.0%) in comparison to black (58.9% and 56.6%) and Latino respondents (68.6% and 64.8%; see Table 5b). A significant difference was also observed between blacks and Latinos for agreement with the statement *I don't know where to go to get a PrEP prescription* (58.9% vs. 68.6%). Conversely, the majority of respondents disagreed with the statements *I don't know how to enroll in health insurance so I can start taking PrEP* (68.5%) and *I wouldn't be able to take PrEP because I don't have health insurance* (69.9%) with a significantly greater percentage of white respondents disagreeing with these statements (83.1% and 80.3%) in comparison to black (63.8% and 65.7%) and Latino respondents (63.0% and 66.5%).

TABLE 5c. Cost concerns about PrEP use among PrEP naïve respondents (n=544).

	TOTAL	RACE/ETHNICITY			AGE GROUP		
	PrEP NAÏVE RESPONDENTS (N=544) COLUMN %	WHITE (N=142) COLUMN %	BLACK (N=175) COLUMN %	LATINO (N=227) COLUMN %	18–21 (N=173) COLUMN %	22–25 (N=215) COLUMN %	26–29 (N=156) COLUMN %
I would take PrEP if it was free.							
DISAGREE	69 (12.8%)	19 (13.5%)	28 (16.0%)	22 (9.8%)	27 (15.6%)	24 (11.3%)	18 (11.5%)
AGREE	472 (87.2%)	122 (86.5%)	147 (84.0%)	203 (90.2%)	146 (84.4%)	188 (88.7%)	138 (88.5%)
I wouldn't be able to afford PrEP.[b]							
DISAGREE	223 (41.1%)	62 (43.7%)	82 (46.9%)	79 (35.0%)	74 (43.0%)	87 (40.5%)	62 (39.7%)
AGREE	320 (58.9%)	80 (56.3%)	93 (53.1%)	147 (65.0%)	98 (57.0%)	128 (59.5%)	94 (60.3%)

The majority (87.2%) of respondents agreed with the statement *I would take PrEP if it were free* (see Table 5c). The majority of respondents agreed with the statement *I wouldn't be able to afford PrEP* (58.9%) with significantly more Latinos (65.0%) agreeing with this statement in comparison to black respondents (53.1%).

* Ratings of strongly disagree and disagree are collapsed into disagree and ratings of strongly agree and agree are collapsed into agree in this table.

[b] Significant differences between Latino and black respondents.

TABLE 5d. Efficacy beliefs about PrEP use among PrEP naïve respondents (n=544).

	TOTAL	RACE/ETHNICITY			AGE GROUP		
	PrEP NAÏVE RESPONDENTS (N=544) COLUMN %	WHITE (N=142) COLUMN %	BLACK (N=175) COLUMN %	LATINO (N=227) COLUMN %	18–21 (N=173) COLUMN %	22–25 (N=215) COLUMN %	26–29 (N=156) COLUMN %
I am concerned that PrEP is only partially effective.							
DISAGREE	226 (41.6%)	66 (46.8%)	72 (41.1%)	88 (38.8%)	71 (41.3%)	96 (44.7%)	59 (37.8%)
AGREE	317 (58.4%)	75 (53.2%)	103 (58.9%)	139 (61.2%)	101 (58.7%)	119 (55.3%)	97 (62.2%)
I would take PrEP if it was 100% effective.							
DISAGREE	90 (16.6%)	20 (14.1%)	34 (19.5%)	36 (15.9%)	26 (15.0%)	38 (17.8%)	26 (16.8%)
AGREE	452 (83.4%)	122 (85.9%)	140 (80.5%)	190 (84.1%)	147 (85.0%)	176 (82.2%)	129 (83.2%)

The majority of respondents agreed with the statements *I am concerned that PrEP is only partially effective* (58.4%) and *I would take PrEP if it were 100% effective* (83.4%; see Table 5d). There were no significant racial/ethnic or age group differences with regard to these statements.

* Ratings of strongly disagree and disagree are collapsed into disagree and ratings of strongly agree and agree are collapsed into agree in this table.

TABLE 5e. **Provider comfort and medical mistrust about PrEP use among PrEP naïve respondents (n=544).**

	TOTAL	RACE/ETHNICITY			AGE GROUP		
	PrEP NAÏVE RESPONDENTS (N=544) COLUMN %	WHITE (N=142) COLUMN %	BLACK (N=175) COLUMN %	LATINO (N=227) COLUMN %	18–21 (N=173) COLUMN %	22–25 (N=215) COLUMN %	26–29 (N=156) COLUMN %
I don't trust drug companies.[d]							
DISAGREE	351 (64.5%)	87 (61.3%)	118 (67.4%)	146 (64.3%)	124 (71.7%)	136 (63.3%)	91 (58.3%)
AGREE	193 (35.5%)	55 (38.7%)	57 (32.6%	81 (35.7%)	49 (28.3%)	79 (36.7%)	65 (41.7%)
I don't trust doctors or healthcare providers.							
DISAGREE	464 (85.8%)	118 (83.1%)	151 (86.8%)	195 (86.7%)	148 (85.5%)	183 (85.5%)	133 (86.4%)
AGREE	77 (14.2%)	24 (16.9%)	23 (13.2%)	30 (13.3%)	25 (14.5%)	31 (14.5%)	21 (13.6%)
I would be uncomfortable asking a doctor for a PrEP prescription.							
DISAGREE	374 (68.9%)	94 (66.2%)	123 (70.7%)	157 (69.2%)	110 (63.6%)	152 (71.0%)	112 (71.8%)
AGREE	169 (31.1%)	48 (33.8%)	51 (29.3%)	70 (30.8%)	63 (36.4%)	62 (29.0%)	44 (28.2%)

* Ratings of strongly disagree and disagree are collapsed into disagree and ratings of strongly agree and agree are collapsed into agree in this table.

[d] Significant age group differences between 18–21 and 26–29 year olds.

The majority of respondents disagreed with the statement *I don't trust drug companies* (64.5%) with significantly more 18–21 year olds disagreeing (71.7%) in comparison to 26–29 year olds (58.3%; see Table 5e). The majority of respondents disagreed with the statements *I don't trust doctors or healthcare providers* (85.8%) and *I would be uncomfortable asking a doctor for a PrEP prescription* (68.9%).

TABLE 5f. Side-effect concerns about PrEP use among PrEP naïve respondents (n=544).

	TOTAL	RACE/ETHNICITY			AGE GROUP		
	PrEP NAÏVE RESPONDENTS (N=544) COLUMN %	WHITE (N=142) COLUMN %	BLACK (N=175) COLUMN %	LATINO (N=227) COLUMN %	18–21 (N=173) COLUMN %	22–25 (N=215) COLUMN %	26–29 (N=156) COLUMN %
I am concerned about side effects or feeling sick from taking PrEP.							
DISAGREE	199 (36.6%)	52 (36.6%)	62 (35.4%)	85 (37.4%)	74 (42.8%)	77 (35.8%)	48 (30.8%)
AGREE	345 (63.4%)	90 (63.4%)	113 (64.6%)	142 (62.6%)	99 (57.2%)	138 (64.2%)	108 (69.2%)
Not knowing if there are long-term side effects of taking PrEP makes me very uncomfortable.							
DISAGREE	162 (29.8%)	41 (28.9%)	62 (35.4%)	59 (26.1%)	54 (31.2%)	70 (32.7%)	38 (24.4%)
AGREE	381 (70.2%)	101 (71.1%)	113 (64.6%)	167 (73.9%)	119 (88.8%)	144 (67.3%)	118 (75.6%)
I would take PrEP if there weren't any side effects.							
DISAGREE	155 (28.7%)	39 (27.5%)	54 (31.4%)	62 (27.3%)	53 (30.6%)	62 (29.1%)	40 (25.8%)
AGREE	386 (71.3%)	103 (72.5%)	118 (68.6%)	165 (72.7%)	120 (69.4%)	151 (70.9%)	115 (74.2%)

* Ratings of strongly disagree and disagree are collapsed into disagree and ratings of strongly agree and agree are collapsed into agree in this table.

Nearly two-thirds of respondents agreed with the statement *I am concerned about side effects or feeling sick from taking PrEP* (63.4%; see Table 5f) and *Not knowing if there are long-term side effects of taking PrEP makes me very uncomfortable* (70.2%). At the same time, the majority (71.3%) of respondents agreed with the statement *I would take PrEP if there weren't any side effects.* There were no significant racial/ethnic or age group differences with regard to these statements.

TABLE 5g. Stigma and social norms about PrEP use among PrEP naïve respondents (n=544).

	TOTAL	RACE/ETHNICITY			AGE GROUP		
	PrEP NAÏVE RESPONDENTS (N=544) COLUMN %	WHITE (N=142) COLUMN %	BLACK (N=175) COLUMN %	LATINO (N=227) COLUMN %	18–21 (N=173) COLUMN %	22–25 (N=215) COLUMN %	26–29 (N=156) COLUMN %
I would be concerned about friends finding out if I started taking PrEP.							
DISAGREE	394 (72.7%)	103 (73.0%)	125 (71.8%)	166 (73.1%)	116 (67.1%)	161 (75.2%)	117 (75.5%)
AGREE	148 (27.3%)	38 (27.0%)	49 (28.2%)	61 (26.9%)	57 (32.9%)	53 (24.8%)	38 (24.5%)
I would be concerned about family members finding out if I started taking PrEP. [d, e]							
DISAGREE	299 (55.0%)	73 (51.4%)	102 (58.3%)	124 (54.6%)	81 (46.8%)	124 (57.7%)	94 (60.3%)
AGREE	245 (45.0%)	69 (48.6%)	73 (41.7%)	103 (45.4%)	92 (53.2%)	91 (42.3%)	62 (39.7%)
I would be concerned about sex partners finding out if I started taking PrEP. [a, c, e]							
DISAGREE	416 (76.9%)	125 (88.0%)	128 (74.0%)	163 (72.1%)	122 (70.5%)	174 (81.7%)	120 (77.4%)
AGREE	125 (23.1%)	17 (12.0%)	45 (26.0%)	63 (27.9%)	51 (29.5%)	39 (18.3%)	35 (22.6%)
I would take PrEP if I found out that some of my friends were taking it. [b, c]							
DISAGREE	235 (43.3%)	72 (51.1%)	81 (46.3%)	82 (46.3%)	62 (36.3%)	97 (45.1%)	76 (49.0%)
AGREE	306 (56.6%)	69 (48.9%)	94 (53.7%)	143 (63.6%)	109 (63.7%)	118 (54.9%)	79 (51.0%)

* Ratings of strongly disagree and disagree are collapsed into disagree and ratings of strongly agree and agree are collapsed into agree in this table.

[a] Significant differences between white and black respondents.

[b] Significant differences between Latino and black respondents.

[c] Significant differences between Latino and white respondents.

[d] Significant age group differences between 18–21 and 26–29 year olds.

[e] Significant age group differences between 18–21 and 22 –25 year olds.

The majority of respondents disagreed with the statement *I would be concerned about friends finding out if I started taking PrEP* (72.7%; see Table 5g). The majority of respondents disagreed with the statement *I would be concerned about family members finding out if I started taking PrEP* (55.0%). However, a significantly greater percentage of 22–25 year olds (57.7%) and 26–29 year olds (60.3%) disagreed with this statement in comparison to 18–21 years olds (46.8%). The majority of respondents disagreed with the statement *I would be concerned about sex partners finding out if I started taking* PrEP (76.9%). However, a significantly greater percentage of white respondents disagreed with this statement (88.0%) in comparison to Latino (72.1%) and black respondents (74.0%). In addition, a majority of respondents agreed with the statement *I would take PrEP if I found out that some of my friends were taking it* (56.6%) with a significantly greater percentage of Latinos agreeing with this statement (63.6%) in comparison to black (53.7%) and white respondents (48.9%).

TABLE 5h. Sexual risk concerns about PrEP use among PrEP naïve respondents (n=544).

	TOTAL	RACE/ETHNICITY			AGE GROUP		
	PrEP NAÏVE RESPONDENTS (N=544) COLUMN %	WHITE (N=142) COLUMN %	BLACK (N=175) COLUMN %	LATINO (N=227) COLUMN %	18 – 21 (N=173) COLUMN %	22 – 25 (N=215) COLUMN %	26 – 29 (N=156) COLUMN %
I would use condoms less if I started taking PrEP.							
DISAGREE	382 (70.5%)	90 (63.4%)	126 (72.8%)	166 (73.1%)	117 (68.0%)	151 (70.6%)	114 (73.1%)
AGREE	160 (29.5%)	52 (36.6%)	47 (27.2%)	61 (26.9%)	55 (32.0%)	63 (29.4%)	42 (26.9%)
I am concerned that I would take more sexual risks if I started taking PrEP.							
DISAGREE	292 (53.8%)	75 (52.8%)	105 (60.3%)	112 (49.3%)	84 (48.6%)	117 (54.4%)	91 (58.7%)
AGREE	251 (46.2%)	67 (47.2%)	69 (39.7%)	115 (50.7%)	89 (51.4%)	98 (45.6%)	64 (41.3%)
I think people who take PrEP will take more sexual risks.							
DISAGREE	193 (35.6%)	44 (31.0%)	62 (35.4%)	87 (38.7%)	62 (36.0%)	72 (33.6%)	59 (37.8%)
AGREE	349 (64.4%)	98 (69.0%)	113 (64.6%)	138 (61.3%)	110 (64.0%)	142 (66.4%)	97 (62.2%)

* Ratings of strongly disagree and disagree are collapsed into disagree and ratings of strongly agree and agree are collapsed into agree in this table.

The majority of respondents disagreed with the statements *I would use condoms less if I started taking PrEP* (70.5%) and *I am concerned that I would take more sexual risks if I started taking PrEP* (53.8%; see Table 5h). Nearly two-thirds (64.4%) of respondents agreed with the statement *I think people who take PrEP will take more sexual risks*. There were no significant racial/ethnic or age group differences with regard to these statements.

Factors Related to Likelihood of Taking PrEP among PrEP Naïve Respondents

The relationship of multiple factors to the likelihood of taking PrEP were examined concurrently to determine the influence of each individually while controlling for the influence of the others among PrEP naïve respondents. Ethnicity, income, region, employment status, condomless receptive anal sex, having enough information about PrEP, knowing where to get PrEP, and some attitudes were significantly associated with the likelihood of taking PrEP (see Table 6). The odds of Latinos taking PrEP were twice (2.21 times) that of white respondents, although there were no significant differences in the odds of taking PrEP between black respondents and their white counterparts. The odds of taking PrEP among respondents reporting an income of $60,000 or more were less than half (0.39 times) of those reporting an income of $29,000 or less. The odds of taking PrEP among respondents residing in the Inland Empire region were twice (2.22 times) that of respondents residing in Los Angeles. The odds of full-time students taking PrEP were twice (2.04 times) that of respondents with full-time employment. The odds of taking PrEP among respondents reporting condomless receptive anal sex in the last 6 months were almost twice (1.89 times) that of respondents reporting no condomless receptive anal sex in the last 6 months. The odds of taking PrEP among those reporting to have enough information about PrEP were more than twice (2.55 times) that of respondents not having enough information about PrEP. Conversely, the odds of taking PrEP among those who knew where to get PrEP were only about half (0.45 times) that of those who didn't know where to get PrEP.

Seven agreement statements were included in the analysis to assess their relationship with the likelihood of taking PrEP. These agreement statements assessed potential barriers to PrEP use that included long-term side effects, stigma, sexual risk concerns, medical mistrust, efficacy, cost, and comfort with medical provider. Agreement with two key attitudinal statements was associated with the likelihood of taking PrEP. The odds of taking PrEP among respondents that agreed with *Not knowing if there are long-term side effects of taking PrEP makes me very uncomfortable* and *I don't trust doctors or healthcare providers* was about half (0.53 and 0.41 times, respectively) that of respondents that disagreed with these statements.

TABLE 6. Assessment of multiple factors among PrEP naïve respondents and the likelihood of taking PrEP.

High Likelihood of Taking PrEP Among PrEP Naive (N=450)		ODDS RATIO (95% CI)
ETHNICITY	White	Ref
	Black	1.20 (0.66–2.19)
	Latino	2.21 (1.24–3.97)
AGE GROUP	18–21	Ref
	22–25	1.25 (0.71–2.22)
	26–29	1.20 (0.64–2.25)
SEXUAL ORIENTATION	Bisexual	Ref
	Gay	1.73 (0.95–3.17)
INCOME IN LAST YEAR	$29k or less	Ref
	$30k to $59k	1.31 (0.7 –2.29)
	$60k or more	0.39 (0.16–0.97)
REGION	Los Angeles	Ref
	Bay Area	1.01 (0.58–1.75)
	Central Coast	0.44 (0.09–2.22)
	Central Valley	1.25 (0.55–2.82)
	Inland Empire	2.22 (1.08–4.59)
	Northern California	2.76 (0.26–28.85)
	San Diego/Imperial	2.44 (0.93–6.42)
HEALTH INSURANCE COVERAGE	No	Ref
	Yes	0.75 (0.43–1.29)
NUMBER OF SEX PARTNERS IN LAST 6 MONTHS	1 or less	Ref
	2 or more	1.36 (0.77–2.39)
DOCTOR VISITS IN PAST YEAR	0 times	Ref
	1 time	1.11 (0.52–2.40)
	2 or more times	1.30 (0.65–2.60)
EMPLOYMENT STATUS	Full-time	Ref
	Part-time	0.96 (0.54–1.71)
	Full-time student	2.04 (1.05–3.95)
	Unemployed	1.18 (0.50–2.81)

(cont.)

CONDOMLESS RECEPTIVE ANAL SEX IN LAST 6 MONTHS	No	Ref
	Yes	1.89 (1.17–3.03)
STI DIAGNOSIS IN THE PAST YEAR	Yes	Ref
	No	0.70 (0.40–1.22)
PREP AWARE	No	Ref
	Yes	1.05 (0.60–1.86)
HAVE ENOUGH INFORMATION ABOUT PREP	No	Ref
	Yes	2.55 (1.46–4.44)
KNOW WHERE TO GET PREP	No	Ref
	Yes	0.45 (0.27–0.76)
NOT KNOWING IF THERE ARE LONG-TERM SIDE EFFECTS OF TAKING PREP MAKES ME VERY UNCOMFORTABLE	Disagree	Ref
	Agree	0.53 (0.32–0.90)
I WOULD BE CONCERNED ABOUT FRIENDS FINDING OUT IF I STARTED TAKING PREP	Disagree	Ref
	Agree	0.90 (0.53–1.54)
I AM CONCERNED THAT I WOULD TAKE MORE SEXUAL RISKS IF I STARTED TAKING PREP	Disagree	Ref
	Agree	0.76 (0.48–1.21)
I DON'T TRUST DOCTORS OR HEALTHCARE PROVIDERS	Disagree	Ref
	Agree	0.41 (0.22–0.78)
I AM CONCERNED THAT PREP IS ONLY PARTIALLY EFFECTIVE	Disagree	Ref
	Agree	0.68 (0.43–1.09)
I WOULDN'T BE ABLE TO AFFORD PREP	Disagree	Ref
	Agree	1.20 (0.73–1.96)
I WOULD BE UNCOMFORTABLE ASKING A DOCTOR FOR A PREP PRESCRIPTION	Disagree	Ref
	Agree	0.73 (0.45–1.18)

*Values highlighted in blue denote statistically significant associations between a factor and the outcome.

PrEP EXPERIENCED RESPONDENTS

Approximately 1 in 10 (9.6%; 58/602) respondents indicated having taken PrEP. PrEP use was significantly higher among white respondents (13.9%) compared to PrEP use among Latino respondents (6.6%; see Table 1). PrEP use among black respondents was 9.8%, though not significantly different from white or Latino respondents. PrEP use was significantly higher among 22–25 year olds (14.0%) and 26–29 year olds (9.3%) compared to PrEP use among 18–21 year olds (3.9%). PrEP use was significantly higher among respondents with annual incomes of $30,000 or higher (13.0%) compared to PrEP use among respondents with annual incomes of $29,000 or less (9.9%). There were no significant regional differences for PrEP use.

When PrEP experienced respondents were asked to rate the importance of various reasons for taking PrEP, the top 5 important reasons included wanting to worry less about getting HIV, having more than one sexual partner, having sex with people whose HIV status was not known, not always using condoms, and having PrEP recommended by a doctor or healthcare provider.

The majority (69.0%; 40/58) of PrEP experienced respondents were currently using PrEP at the time of the survey. Men who were no longer using PrEP (31%; 18/58) cited various reasons for discontinuing PrEP including concerns about the long-term side effects of taking PrEP, not being able to afford the prescription or required medical visits for PrEP, not wanting to visit the doctor on a regular basis for followup, forgetting to take PrEP every day or not wanting to take PrEP every day, using other strategies to reduce their risk of getting HIV instead of using PrEP, having entered into a monogamous relationship, and feeling sick from the side effects of taking PrEP.

Among those currently using PrEP, a plurality (47.5%) indicated no monthly out-of-pocket costs with the remaining indicating $5 to $10 (15.0%), $11 to $30 (17.5%), and $31 or more (20%) dollars in out-of-pocket costs per month. Indeed, a majority (55%) of current PrEP users indicated receiving financial assistance to help pay for their PrEP prescription each month. Among those not receiving financial assistance, half (50%) said they wanted help to pay for PrEP. When current PrEP users were asked about other assistance such as support to help remember to take their PrEP pill, nearly half (45%) said they would like adherence support.

DISCUSSION AND RECOMMENDATIONS

YMSM, and in particular black and Latino YMSM, are most at risk for HIV in California and throughout the US. The CDC now predicts that, if current HIV infection rates continue, half of all black gay and bisexual men and a quarter of all Latino gay and bisexual men could be infected with HIV in their lifetimes.[3] PrEP holds the promise of significantly reducing new HIV infection rates in this and all other at-risk populations, but recent studies have shown that awareness and use of PrEP among YMSM is extremely limited. This study sought to examine current levels of PrEP awareness and use, likelihood of use, as well as attitudes and barriers to PrEP uptake among YMSM in California, with a particular focus on black and Latino YMSM.

1. Targeted education campaigns and interventions are needed to increase PrEP awareness and uptake, especially among black and Latino, low-income, and non-gay identified YMSM.

Our study results showed high levels of PrEP awareness among YMSM in California. Nearly three-quarters (73.0%) of our sample was aware of PrEP, which is significantly higher than several previous studies of PrEP awareness in the US.[14-24] However, this finding is consistent with two more recent studies of PrEP awareness showing that 86% of high-risk MSM in Seattle, Washington and 68% of MSM in the US were aware of PrEP.[16, 19] Together these results provide evidence that PrEP awareness is increasing among YMSM, likely due to expanded education efforts and increased media coverage of PrEP.[29, 30] However, although PrEP awareness in this study was high overall, we found significant racial/ethnic and age disparities. PrEP awareness was significantly lower among black and Latino YMSM compared to white YMSM. PrEP awareness was also significantly lower among YMSM ages 18–21 compared to their older counterparts. These findings demonstrate the need for targeted education campaigns to increases PrEP awareness among YMSM of color, particularly those who are younger.

We also found significant differences in PrEP awareness with respect to respondents' sexual orientation and gender of sex partners. PrEP awareness was significantly higher among gay identified respondents and respondents whose sex partners were only men compared to bisexual identified respondents and respondents whose sex partners were both men and women, respectively. YMSM who are non-gay identifying and those who have sex with both men and women are an important risk group in need of tailored HIV prevention services. Homophobia and social stigma may prevent these individuals from self-identifying as gay or bisexual and serve as barriers to accessing HIV prevention services.[31,32] For example, these individuals may avoid accessing PrEP at a clinic serving primarily gay-identified YMSM out of fear that they will be stigmatized if their same-sex behavior were to be exposed.[33]

> "PrEP needs more visibility, especially in low socioeconomic communities."
>
> 22 year old, black gay male

Less than 10% of YMSM in this study had ever used PrEP, which is significantly higher than rates of PrEP use reported in previous studies of MSM.[13-15, 17, 18, 20-24] However, more recent studies have found higher rates of PrEP use indicating that PrEP use among MSM is increasing.[16, 19, 25] Still, the number of YMSM using PrEP in this study is low given the CDC's recent estimate that 1 in 4 sexually active gay and bisexual men meet criteria for PrEP.[34] We also found significant racial/ethnic, age, and income differences with regard to PrEP use. These results provide evidence that younger, low-income, YMSM of color are less likely to be early adopters of PrEP. These communities may face a number of social and structural barriers that prevent them from accessing PrEP including discrimination, family rejection, lack of stable housing, unemployment, prohibitive immigration policies, and limited education.[35] Targeted strategies are needed to increase PrEP uptake among YMSM that take these barriers into account. For example, a tailored intervention for black MSM was recently shown to be successful in increasing PrEP use and helping participants remain adherent to the medication.[36] Participants in the study received an individualized care plan that included referrals to health care and mental health services or to organizations that could help them with other needs they may have, such as services for housing or drug and alcohol use counseling.[36]

2. Culturally responsive and linguistically appropriate interventions are needed to increase PrEP uptake among YMSM, particularly Latino YMSM.

The majority (55.9%) of YMSM in this study indicated a high likelihood of using PrEP if it were available and also demonstrated favorable attitudes toward PrEP. We found that Latino YMSM were over two times more likely than white YMSM to be interested in taking PrEP if it was available. This finding is particularly interesting given that Latino respondents who were already aware of PrEP were least likely to have enough information about using PrEP and least likely to know where to access PrEP compared to other racial/ethnic groups. In the US, Latino YMSM bear a disproportionate burden of the HIV epidemic and new infection rates among this population continue to rise.[1] Culturally responsive and linguistically appropriate interventions are needed to increase PrEP uptake among this population. For example, interventions aimed at increasing PrEP awareness and use must take into account different attitudes and perceptions of PrEP among distinct sub-populations (e.g., Mexican, Dominican, Puerto Rican) within the Latino community.[37]

3. PrEP access points must be available throughout the state, particularly in communities of color, and provider directories should be widely publicized.

Over half of all PrEP naïve respondents indicated not knowing where to go to get a PrEP prescription (59.3%) or how to find a doctor who could give them a PrEP prescription (56.4%) with black and Latino YMSM being more likely to agree with these statements than whites. It is vital to ensure that a sufficient number of PrEP access sites are available throughout the state, particularly in highly impacted communities of color. Several California jurisdictions have developed directories that list contact information for local medical providers that offer PrEP (e.g., pleaseprepme.org, getprepla.com). Given that many doctors are still unaware of PrEP or uncomfortable prescribing the medication, these directories must continue to be updated regularly and widely publicized.

In addition, the majority (70.5%) of respondents who were already aware of PrEP indicated not having enough information to make a decision about using PrEP. This finding is consistent with another recent study which found that, even among YMSM who were aware of PrEP, there was limited understanding of what PrEP is, how it works, as well as its potential side-effects.[38] Although YMSM may have heard of PrEP through friends, social media, and other sources, educational resources are needed that provide them with detailed information to help them make a decision about whether or not they should begin using PrEP. Several resources that provide this information have been developed (e.g., prepfacts.org, PrEP Facts on Facebook), but YMSM may not be aware of their existence. Further, YMSM may require in-person assistance from a doctor or PrEP navigator to help them determine if they are an appropriate candidate for PrEP.

> "I don't know how to get it or where to find it. Do I just ask my doctor? That's the info that needs to be spread."
>
> 21 year old, black gay male

4. PrEP navigation services tailored to the needs of YMSM of color are essential, and must include screening for and enrollment in health coverage.

We found that being enrolled in health insurance was significantly associated with PrEP awareness and knowing where to get PrEP. In fact, the odds of respondents with health insurance being aware of PrEP and knowing where to get PrEP were nearly three times that of respondents without health insurance. These findings are consistent with a recent study showing that being insured was significantly associated with PrEP use.[25] We also found that black and Latino YMSM were more likely than whites to indicate that lack of health insurance would serve as a barrier to PrEP access.

The Affordable Care Act has greatly reduced the number of uninsured individuals in California. In 2015, however, 1 in 4 of the state's remaining uninsured was between the age of 25 and 34, and more than half (57%) were Latino.[39] It remains vital to ensure that YMSM, particularly YMSM of color, are provided with information and resources to help them enroll in comprehensive health coverage. California must also expand access to health coverage for all Californians regardless of immigrations status. YMSM may also require additional assistance to navigate the complex health care system and patient assistance programs that are available to help pay for PrEP. California recently funded several community-based organizations to provide PrEP navigation services, which will identify individuals interested in PrEP, conduct financial screenings and insurance enrollment, refer qualified individuals to a PrEP-friendly medical provider, and monitor adherence. PrEP navigation services must be accessible throughout the state and programming should be tailored to meet the needs of YMSM.

5. PrEP education must provide clear and consistent information on side effects and efficacy.

Consistent with previous studies, YMSM in this sample indicated having concerns about both short- and long-term side effects from taking PrEP [14, 26] Clinical studies have demonstrated few side effects associated with PrEP use.[6-8] In fact, a recent analysis of five major PrEP studies concluded that Truvada for PrEP compares favorably to aspirin in terms of user safety.[40] Given the high level of concern among YMSM overall, it is critical to provide accurate information about the short- and long-term side effects of PrEP so they can make informed decisions about whether or not PrEP is appropriate for them.

The results of this study indicate that YMSM also have concerns about PrEP's efficacy. Over half (58.4%) of the sample was concerned that PrEP is only partially effective and approximately 8 in 10 (83.4%) said they would take PrEP if it were 100% effective. Despite evidence indicating that PrEP is up to 99% effective when taken as prescribed, YMSM are concerned that PrEP cannot guarantee that they will remain HIV-negative. These concerns were likely amplified following the release of a recent study showing that an individual became infected with a multi-drug-resistant strain of HIV despite very consistent adherence to PrEP.[41] YMSM need clear and consistent messaging with regards to PrEP's high efficacy in order to help address these concerns, particularly from their medical providers and other public health experts.

> "My biggest concern is long-term health impacts of PrEP since there aren't (to the best of my knowledge) any long-term studies on the effects of PrEP in [HIV-negative] people."
>
> 27 year old, white gay male

6. California should use public funds to help pay for PrEP, including PrEP-related clinical ancillary services.

Affordability was also identified as a major barrier to PrEP use among YMSM in this sample, particularly among Latinos. Over half (58.9%) of respondents felt they would not be able to afford PrEP, and nearly 9 in 10 (87.2%) indicated they would take PrEP if it was free. Several previous studies have identified cost as a major concern for YMSM, particularly for those who are uninsured.[14, 26, 28] Indeed, there are a number of costs associated with PrEP that could impede access to the intervention for those with limited financial resources. In addition to the cost of the medication, PrEP use generally requires quarterly visits to a medical provider for HIV and STI screening, treatment for STIs, medical monitoring, assorted labs, and counseling. Out-of-pocket expenses for these clinical ancillary costs can render PrEP cost prohibitive for uninsured and underinsured individuals. Long-term success of PrEP will require YMSM to have access to these services at low or no cost. Although several patient assistance programs are available to help cover the costs of the medication for low-income individuals, these programs do not help pay for doctors'

visits and lab copays associated with PrEP use. Other states, including New York, Washington, and Colorado, have implemented programs to reduce cost-sharing associated with the medication, clinical ancillary services, or both. The California Legislature recently approved the development of a similar PrEP affordability program.

> "I am afraid about whether I can afford PrEP once my insurance ends in late August. Please make PrEP accessible to everyone, especially low income communities of color."
>
> 25 year old, Latino gay gender queer

Contrary to findings from previous studies, the majority of respondents indicated that they were not distrustful of drug companies or healthcare providers.[27] However, the odds of taking PrEP among respondents who were distrustful of doctors or healthcare providers was about half that of those who were not. This finding is consistent with a recent qualitative study of black YMSM, which found that some participants believed PrEP is part of a conspiracy or that taking PrEP may cause HIV infection.[27]

7. California's laws addressing medical confidentiality must be widely publicized, especially for YMSM on another person's health plan.

The majority of YMSM in this study indicated that they would not be concerned about friends, sex partners, or family members finding out if they were taking PrEP. This is reassuring given results from previous studies showing that some YMSM fear using PrEP will lead to gossip from their peers and would avoid using PrEP due to the embarrassment it would cause.[27, 28] However, black and Latino YMSM were significantly more likely than white YMSM to be concerned about sex partners finding out if they were to begin taking PrEP which may reflect some PrEP-related stigma within these communities. In addition, YMSM ages 18–21 years old in the present study were more likely than their older counterparts to be concerned about family members finding out if they were to begin taking PrEP. Minors 12 years of age and older are able to provide consent for PrEP services in California. When an individual accesses PrEP, however, confidential information about these services can be communicated on a number of insurance documents including Explanation of Benefits (EOBs) forms, claims denials, claims acknowledgments, and requests for additional information among others.[42] Research indicates that concerns about confidentiality can prevent young adults from accessing sensitive health care services, even if they are unaware of these insurance company billing communications.[43] In 2013, California lawmakers enacted the Confidential Health Information Act to address privacy concerns of individuals insured as dependents on a parent's or partner's health plan.[44] Specifically, the law allows individuals to submit a confidential communications requests to their health plan when seeking sensitive services such as PrEP under another person's policy. When a confidential communications request is submitted, the health plan is required to communicate with the individual directly about the sensitive services they receive instead of sending information to the main policy holder. YMSM, medical providers, and PrEP navigators must be informed of patient rights regarding confidential health care, including the ability to submit a confidential communications request to their health plan. Targeted education campaigns for YMSM and public education at clinics, community colleges, and universities should be supported.[43]

> "Many people, like myself, aren't out to family members, which can potentially be discouraging when trying to acquire such medicine, especially when under the insurance of those very family members."
>
> 22 year old, Latino gay male

8. Education campaigns should be developed that challenge stereotypical assumptions about who is an appropriate candidate for PrEP.

Regardless of race/ethnicity and age, YMSM in this study were concerned that PrEP use will lead to increased sexual risk behaviors. Nearly half (46.2%) of respondents were concerned they would take more sexual risks if they were to begin taking PrEP and nearly two-thirds (64.4%) felt that PrEP users take more sexual risks. These findings are consistent with previous studies, which found that YMSM are concerned PrEP will lead to increased sex without condoms and fear being labeled as promiscuous if they begin using PrEP.[26-28] Similarly, a recent qualitative study of black YMSM found that some participants did not view themselves as appropriate candidates for PrEP because they do not fit stigmatized stereotypes.[27] Education campaigns should be developed that challenge these beliefs among YMSM, as empirical data suggest risk compensation (i.e., reduction in other prevention behaviors, such as condom use, due to reliance on PrEP) among PrEP users is not universal.[45] These education efforts should help normalize PrEP use, and make it clear that PrEP is not only appropriate for those who are at highest risk for HIV.[27]

9. PrEP outreach and education efforts must follow the market—online.

Over half (56.7%) of PrEP naïve respondents learned about PrEP through social media and just less than half (49.4%) indicated receiving information about PrEP online. Social media apps and websites, such as Facebook, Twitter, Instagram, and Snapchat, are embedded in American culture. Nearly two-thirds (65%) of adults in the US use social networking sites and young people between the ages of 18 and 29 are the heaviest social media users.[46] In addition, there are a number of social networking apps and websites used predominantly by YMSM including Grindr, Scruff, and Jack'd among others. These apps and websites are important channels to disseminate information about PrEP among YMSM. Given that most electronic devices now have geolocation software, these apps and websites can also be used to provide location-specific information about where to access PrEP. Smartphone apps and websites that include risk assessment tools, health insurance screening, opportunities to chat with a medical provider, and other PrEP-specific features could also help improve PrEP access among YMSM. Community-based organizations and government agencies should form partnerships with social networking app and website companies in efforts to increase PrEP awareness and uptake.

10. Provider education is essential to increasing awareness and uptake of PrEP, including encouraging doctors to talk to patients about their sexual behavior.

Few YMSM in this study reported hearing about PrEP from a doctor and the large majority (84.9%) of YMSM who were already aware of PrEP indicated they had never talked to their doctor or healthcare provider about PrEP. These findings are concerning given that the majority of YMSM in this study were engaging in behaviors that put them at risk for HIV and may have benefited from a discussion with their doctor about PrEP. Research indicates that doctors rarely discuss sexual behavior with their patients.[47] In fact, nearly half (47%) of a nationally representative sample of gay and bisexual men reported that they never discussed their sexual orientation with a doctor.[47] Thus, it is important to not only educate providers about the benefits of PrEP, but also to encourage them to talk to patients about their sexual behavior. We found that the majority (61.2%) of PrEP naïve respondents indicated they were comfortable or very comfortable discussing their sexual behavior with their doctor. Including questions about sexual behavior in clinical settings and prompting their use through electronic health records systems will better facilitate the identification of patients that may be good candidates for PrEP.[48] In addition, for YMSM who do not engage regularly with a medical provider, HIV test counselors and other front line workers should be encouraged to incorporate brief PrEP questions and PrEP referrals into their services. The city of West Hollywood now requires that all HIV testing providers have information on display regarding PrEP as part of a comprehensive HIV prevention strategy.[49]

> "All doctors need to be informed about PrEP. It took me four or five different doctors before I found one that knew what PrEP was."
>
> 24 year old, white gay male

LIMITATIONS

The results of this online study must be considered in the context of several limitations. First, the non-experimental and cross-sectional design of the study does not allow us to draw any causal inferences about any of the outcomes including PrEP awareness, PrEP use, intention to use PrEP, or barriers to PrEP uptake. However, we are able to assess significant associations between these outcomes and respondent demographics as well as several key measures. Second, this study is based on a convenience sample of YMSM recruited from popular YMSM sexual networking apps and websites. Because there is no demographic information about individuals who did not respond to the online survey, it is unknown if these individuals differed from those who responded so that there may be a selection bias. Consequently, these results may not be generalizable to the YMSM population in California. Third, study measures in the survey are based on self-reported responses that may introduce respondent error in interpreting questions and response sets as well as the potential for a social desirability bias. However, great care was taken in the development of the survey to ensure the language was easy to understand and the survey was self-administered anonymously, reducing the potential for socially desirable responses. Finally, this study focused solely on PrEP awareness and uptake among black, Latino, and white YMSM. Additional research is needed to better understand the needs of other racial/ethnic groups.

CONCLUSION

This study offers important insights into PrEP awareness and uptake among YMSM in California. While PrEP awareness and use appear to be increasing among YMSM overall, significant racial/ethnic and age group disparities exist. Given the disproportionate impact of HIV among black and Latino YMSM, PrEP implementation efforts must prioritize increasing education and improving access within these communities. This study also identified a number of barriers that may impede PrEP uptake among YMSM including concerns about side-effects, efficacy, and cost. Many of these concerns were identified by the majority of YMSM regardless of race/ethnicity and age. PrEP education efforts must provide clear and consistent information on side effects and efficacy, and California should use public funds to help pay for PrEP. YMSM also have unique privacy concerns and California's laws addressing medical confidentiality must be widely publicized. Given the complex nature of the health care system in the US, YMSM will need assistance from doctors and PrEP navigators to determine if they are appropriate candidates for PrEP, enroll in health coverage, identify a PrEP-friendly provider, apply for patient assistance programs, and access ongoing adherence support. Educating medical providers about who is an appropriate candidate for PrEP and encouraging them to discuss sexual behavior with their patients are also essential to increasing PrEP awareness and uptake among YMSM. Failure to address the PrEP-related concerns and barriers experienced by YMSM of color will only serve to exacerbate existing health disparities and limit PrEP's ability to achieve a population-level effect on HIV transmission.

1. Centers for Disease Control and Prevention. HIV surveillance report, 2014 [Internet]. Atlanta, GA: Centers for Disease Control and Prevention; 2015 [cited 2016 Mar 1]. Available from: http://www.cdc.gov/hiv/library/reports/surveillance/.

2. Johnson AS, Hall HI, Hu X, Lansky A, Holtgrave DR, Mermin J. Trends in diagnoses of HIV infection in the United States, 2002–2011. JAMA 2014;312:432–4.

3. Centers for Disease Control and Prevention. Lifetime risk of HIV diagnosis in the United States [Internet]. Atlanta, GA: Centers for Disease Control and Prevention; 2016 [cited 2016 Feb 29]. Available from: http://www.cdc.gov/nchhstp/newsroom/docs/factsheets/lifetime-risk-hiv-dx-us.pdf.

4. Centers for Disease Control and Prevention. NCHHSTP Atlas, 2013 [Internet]. Atlanta, GA: Centers for Disease Control and Prevention; 2014 [cited 2015 Dec 7]. Available from: http://gis.cdc.gov/GRASP/NCHHSTPAtlas/main.html.

5. Sullivan PS, Carballo-Diéguez A, Coates T, Goodreau SM, McGowan I, Sanders EJ, Smith A, Goswami P, Sanchez J. Successes and challenges of HIV prevention in men who have sex with men. The Lancet. 2012;380(9839):388-99.

6. Grant RM, Lama JR, Anderson PL, McMahan V, Liu AY, Vargas L, Goicochea P, Casapía M, Guanira-Carranza JV, Ramirez-Cardich ME. Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. N Engl J Med. 2010;363(27):2587-99.

7. Baeten JM, Donnell D, Ndase P, Mugo NR, Campbell JD, Wangisi J, Tappero JW, Bukusi EA, Cohen CR, Katabira E. Antiretroviral prophylaxis for HIV prevention in heterosexual men and women. N Engl J Med. 2012;367(5):399-410.

8. Choopanya K, Martin M, Suntharasamai P, Sangkum U, Mock PA, Leethochawalit M, Chiamwongpaet S, Kitisin P, Natrujirote P, Kittimunkong S. Antiretroviral prophylaxis for HIV infection in injecting drug users in Bangkok, Thailand (the Bangkok Tenofovir Study): a randomised, double-blind, placebo-controlled phase 3 trial. The Lancet. 2013;381(9883):2083-90.

9. Anderson PL, Glidden DV, Liu A, Buchbinder S, Lama JR, Guanira JV, McMahan V, Bushman LR, Casapía M, Montoya-Herrera O. Emtricitabine-tenofovir concentrations and pre-exposure prophylaxis efficacy in men who have sex with men. Sci Transl Med. 2012;4(151):151ra25.

10. World Health Organization. WHO expands recommendation on oral pre-exposure prophylaxis of HIV infection (PrEP): World Health Organization; 2015 [cited 2016 Mar 25]. Available from: http://www.who.int/hiv/pub/prep/policy-brief-prep-2015/en/.

11. White House Office of National AIDS Policy. National HIV/AIDS strategy for the United States: updated to 2020 [Internet]. Washington, DC: White House Office of National AIDS Policy; 2015 [cited 2016 Mar 25]. Available from: https://www.aids.gov/federal-resources/national-hiv-aids-strategy/nhas-update.pdf.

12. Centers for Disease Control and Prevention. As many as 185,000 new HIV infections in the U.S. could be prevented by expanding testing, treatment, PrEP [Internet]. Atlanta, GA: Centers for Disease Control and Prevention; 2016 [cited 2016 Mar 25]. Available from: http://www.cdc.gov/nchhstp/newsroom/2016/croi-press-release-prevention.html.

13. Barash EA, Golden M. Awareness and use of HIV pre-exposure prophylaxis among attendees of a seattle gay pride event and sexually transmitted disease clinic. AIDS Patient Care STDS. 2010;24(11):689-91.

14. Bauermeister JA, Meanley S, Pingel E, Soler JH, Harper GW. PrEP awareness and perceived barriers among single young men who have sex with men in the United States. Current HIV Research. 2013;11(7):520-7.

15. Brooks RA, Landovitz RJ, Regan R, Lee S-J, Allen VC. Perceptions of and intentions to adopt HIV pre-exposure prophylaxis among black men who have sex with men in Los Angeles. Int J STD AIDS. 2015;26(14):1040-8.

16. Delaney KP, Sanchez T, Bowles K, Oraka E, DiNenno EA, Sullivan PS. Awareness and use of PrEP appear to be increasing among internet samples of US MSM. Conference on Retroviruses and Opportunistic Infections (CROI 2016); Boston, MA: CROI; 2016.

17. Dolezal C, Frasca T, Giguere R, Ibitoye M, Cranston RD, Febo I, Mayer KH, McGowan I, Carballo-Diéguez A. Awareness of post-exposure prophylaxis (PEP) and pre-exposure prophylaxis (PrEP) is low but interest is high among men engaging in condomless anal sex with men in Boston, Pittsburgh, and San Juan. AIDS Educ Prev. 2015;27(4):289-97.

18. Eaton LA, Driffin DD, Bauermeister J, Smith H, Conway-Washington C. Minimal awareness and stalled uptake of pre-exposure prophylaxis (PrEP) among at risk, HIV-negative, black men who have sex with men. AIDS Patient Care STDS. 2015;29(8):423-9.

19. Hood JE, Buskin SE, Dombrowski JC, Kern DA, Barash EA, Katzi DA, Golden MR. Dramatic increase in preexposure prophylaxis use among MSM in Washington state. AIDS. 2016;30(3):515-9.

20. Krakower DS, Mimiaga MJ, Rosenberger JG, Novak DS, Mitty JA, White JM, Mayer KH. Limited awareness and low immediate uptake of pre-exposure prophylaxis among men who have sex with men using an internet social networking site. PLoS One. 2012;7(3):e33119.

21. Liu AY, Kittredge PV, Vittinghoff E, Raymond HF, Ahrens K, Matheson T, Hecht J, Klausner JD, Buchbinder SP. Limited knowledge and use of HIV post-and pre-exposure prophylaxis among gay and bisexual men. J Acquir Immune Defic Syndr. 2008;47(2):241-7.

22. Mayer KH, Oldenburg CE, Novak DS, Elsesser SA, Krakower DS, Mimiaga MJ. Early adopters: correlates of HIV chemoprophylaxis use in recent online samples of US men who have sex with men [Epub ahead of print]. AIDS Behav. 2015. doi:10.1007/s10461-015-1237-1

23. Mimiaga MJ, Case P, Johnson CV, Safren SA, Mayer KH. Preexposure antiretroviral prophylaxis attitudes in high-risk Boston area men who report having sex with men: limited knowledge and experience but potential for increased utilization after education. J Acquir Immune Defic Syndr. 2009;50(1):77-83.

24. Rucinski KB, Mensah NP, Sepkowitz KA, Cutler BH, Sweeney MM, Myers JE. Knowledge and use of pre-exposure prophylaxis among an online sample of young men who have sex with men in New York City. AIDS Behav. 2013;17(6):2180-4.

25. Scanlin KK, Salcuni PM, Edelstein ZR, Daskalakis DC, Mensah NP, Tsoi B, Myers J. Increasing PrEP use among men who have sex with men, New York City, 2013-2015. Conference on Retroviruses and Opportunistic Infections (CROI 2016); Boston, MA: CROI; 2016.

26. Kubicek K, Arauz-Cuadra C, Kipke MD. Attitudes and perceptions of biomedical HIV prevention methods: voices from young men who have sex with men. Arch Sex Behav. 2015;44(2):487-97.

27. Mutchler MG, McDavitt B, Ghani MA, Nogg K, Winder TJ, Soto JK. Getting PrEPared for HIV prevention navigation: young black gay men talk about HIV prevention in the biomedical era. AIDS Patient Care STDS. 2015;29(9):490-502.

28. Smith DK, Toledo L, Smith DJ, Adams MA, Rothenberg R. Attitudes and program preferences of African-American urban young adults about pre-exposure prophylaxis (PrEP). AIDS Educ Prev. 2012;24(5):408-21.

29. Barro J. San Francisco official says he takes Truvada to prevent H.I.V., and more gay men should, too New York, NY: The New York Times; 2014 [2016]. Mar 25]. Available from: http://www.nytimes.com/2014/09/18/upshot/san-francisco-politician-says-hes-on-pill-to-prevent-hiv.html.

30. Karlamangla S. County backs drugs for HIV prevention, but health officials have concerns Los Angeles, CA: Los Angeles Times; 2015. Available from: http://www.nytimes.com/2014/09/18/upshot/san-francisco-politician-says-hes-on-pill-to-prevent-hiv.html.

31. Kennamer JD, Honnold J, Bradford J, Hendricks M. Differences in disclosure of sexuality among African American and White gay/bisexual men: Implications for HIV/AIDS prevention. AIDS Educ Prev. 2000;12(6):519-31.

32. Zea MC, Reisen CA, Díaz RM. Methodological issues in research on sexual behavior with Latino gay and bisexual men. Am J Community Psychol. 2003;31(3-4):281-91.

33. Benoit E, Pass M, Randolph D, Murray D, Downing Jr MJ. Reaching and engaging non-gay identified, non-disclosing Black men who have sex with both men and women. Culture, Health & Sexuality. 2012;14(9):975-90.

34. Smith DK, Van Handel M, Wolitski RJ, Stryker JE, Hall HI, Prejean J, Koenig LJ, Valleroy LA. Vital signs: Estimated percentages and numbers of adults with indications for preexposure prophylaxis to prevent HIV acquisition–United States, 2015. Morbidity and Mortality Weekly Report. 2015;64(46):1291-5.

35. Levy ME, Wilton L, Phillips II G, Glick SN, Kuo I, Brewer RA, Elliott A, Watson C, Magnus M. Understanding structural barriers to accessing HIV testing and prevention services among black men who have sex with men (BMSM) in the United States. AIDS Behav. 2014;18(5):972-96.

36. Wheeler DP, Fields S, Nelson LE, Wilton L, Hightow-Weidman L, Shoptaw S, Magnus M, Beauchamp G, Watkins P, Mayer KH. HTPN 073: PrEP uptake and use by black men who have sex with men in 3 US cities. Conference on Retroviruses and Opportunistic Infections (CROI 2016); Boston, MA: CROI; 2016.

37. Garcia D, Betancourt G, Scaccabarrozzi L. The state of HIV/AIDS among Hispanics/Latinos in the US and Puerto Rico [Internet]. New York, NY: Latino Commission on AIDS; 2015 [cited 2016 Mar 25]. Available from: https://www.fpcouncil.com/sites/fpcouncil.com/files/files/HIVbrief2015_Eng.pdf.

38. Pérez-Figueroa RE, Kapadia F, Barton SC, Eddy JA, Halkitis PN. Acceptability of PrEP uptake among racially/ethnically diverse young men who have sex with men: The P18 Study. AIDS Educ Prev. 2015 Apr;27(2):112.

39. Fronstin P. California's uninsured: coverage expands, but millions left behind Oakland, CA: California Health Care Foundation; 2016 [cited 2016 Mar 25]. Available from: http://www.chcf.org/~/media/MEDIA%20LIBRARY%20Files/PDF/PDF%20C/PDF%20CaliforniaUninsured2016.pdf.

40. Kojima N, Klausner JD. Is emtricitabine-tenofovir disoproxil fumarate pre-exposure prophylaxis for the prevention of human immunodeficiency virus infection safer than aspirin? Open Forum Infectious Diseases. 2016;3(1):ofv221. doi:10.1093/ofid/ofv221

41. Knox DC, Tan DH, Harrigan R, Anderson PL. HIV-1 infection with multiclass resistance despite preexposure prophylaxis (PrEP). Conference on Retroviruses and Opportunistic Infections (CROI 2016); Boston, MA: CROI; 2016.

42. Malvin J, Daniel S, Brindis CD. California's Confidential Health Information Act (SB 138): implementation readiness among health insurers and health plans [Internet]. San Francisco, CA: Philip R. Lee Institute for Health Policy Studies, University of California, San Francisco; 2015 [cited 2016 Mar 25]. Available from: http://healthpolicy.ucsf.edu/sites/healthpolicy.ucsf.edu/files/documents/PRL-IHPS-SB138Brief.pdf.

43. Frerich EA, Garcia CM, Long SK, Lechner KE, Lust K, Eisenberg ME. Health care reform and young adults' access to sexual health care: an exploration of potential confidentiality implications of the Affordable Care Act. Am J Public Health. 2012;102(10):1818-21.

44. SB-138 Confidentiality of medical information [Internet]. Sacramento, CA: California Legislative Information; 2013 [cited 2016 Mar 25]. Available from: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140SB138.

45. Teyssier LS, Suzan-Monti M, Castro DR, Hall N, Capitant C, Chidiac C, Tremblay C, Spire B, Molina J-M. PrEP and condom use in high risk MSM in the ANRS IPERGAY trial. Conference on Retroviruses and Opportunistic Infections (CROI 2016); Boston, MA: CROI; 2016.

46. Perrin A. Social media usage: 2005-2015 [Internet]. Washington, DC: Pew Research Center; 2015 [cited 2016 Mar 25]. Available from: http://www.pewinternet.org/2015/10/08/social-networking-usage-2005-2015/.

47. Hamel L, Firth J, Hoff T, Kates J, Levine S, Dawson L. HIV/AIDS in the lives of gay and bisexual men in the United States [Internet]. Menlo Park, CA: Henry J. Kaiser Family Foundation; 2014 [cited 2016 Mar 25]. Available from: http://kff.org/hivaids/report/hivaids-in-the-lives-of-gay-and-bisexual-men-in-the-united-states/.

48. Cahill S, Singal R, Grasso C, King D, Mayer K, Baker K, Makadon H. Do ask, do tell: high levels of acceptability by patients of routine collection of sexual orientation and gender identity data in four diverse American community health centers. PLoS One. 2014;9(9):e107104.

49. WeHo city council is asked to take a stand on controversial HIV prevention drug [Internet]. West Hollywood, CA: WEHOville; 2015 [cited 2016 Mar 25]. Available from: http://www.wehoville.com/2015/06/15/weho-city-council-is-asked-to-take-a-stand-on-controversial-hiv-prevention-drug/.

California HIV/AIDS
Research Program