

MSM at Highest Risk for HIV Acquisition Express Greatest Interest and Preference for Injectable Antiretroviral PrEP Compared to Daily, Oral Medication

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Abstract Men who have sex with men (MSM) account for nearly 70% of new HIV diagnoses, with young black MSM at the highest risk for infection in the United States. Pre-exposure prophylaxis (PrEP) can decrease HIV acquisition in at-risk individuals by over 90%. However, therapeutic efficacy requires a daily pill, posing adherence challenges. Experimental modalities, including injectable PrEP given once every 2 months, may improve adherence among those most in need. To assess interest in and preference for injectable PrEP, an online survey was mounted on two popular MSM sexual networking apps. Differences by age, race, and other characteristics were examined using multinomial logistic regressions. Of 4638 respondents, 73% expressed interest in injectable PrEP and 47% indicated they would prefer an injection (compared to 17% who prefer a daily pill and 36% who were unsure). Within this sample, interest in and preference for injectable PrEP was highest among MSM

at highest risk for HIV infection (i.e., younger age groups, racial/ethnic minorities, those with riskier sexual behavior). As a result, if proven effective in clinical trials, injectable PrEP has the potential to reduce social disparities in HIV transmission among MSM.

Keywords HIV transmission · Men who have sex with men · Youth · Racial/ethnic minorities · Pre-exposure prophylaxis

Introduction

In 2015, nearly 40,000 people were diagnosed with HIV in the United States (U.S.), with men who have sex with men (MSM) accounting for nearly 70% of these infections [1]. Important HIV transmission disparities exist, particularly by race and age. Blacks represent 12% of the U.S. population but account for 40% of HIV cases among MSM. Moreover, while HIV diagnoses among white MSM have fallen by 18% over the last decade, they rose by over 20% among black and Hispanic MSM [2]. Gaps in the age of diagnosis have also grown. Adolescents and young adults (ages 13–29) represent over 40% of all new cases of HIV; 80% of youth diagnoses occur in young men who have sex with men (YMSM) [2]. Black YMSM are at the highest risk for HIV infection in the U.S. Despite this subpopulation being the focus of enhanced HIV prevention initiatives [3], disparities persist.

In addition to behavioral risk reduction, pharmacological pre-exposure prophylaxis (PrEP) has the potential to effectively curtail new transmissions by protecting uninfected individuals from HIV transmission [4, 5]. Currently, the only U.S. FDA-approved and recommended formulation of PrEP is the once daily, oral antiretroviral combination pill consisting of tenofovir disoproxil fumarate and emtricitabine (TDF/

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FTC). When taken as prescribed, PrEP users can decrease their risk for HIV infection by over 90% compared to non-users [4]. However, maximizing the efficacy of PrEP can only be achieved through consistent medication adherence. In the intention-to-treat analysis of the 2010 iPrEx study, PrEP lowered HIV transmission among MSM and transgender women by 44% [6]. Further, the as-treated analysis for iPrEx demonstrated that participants with TDF/FTC blood levels indicative of four or more pills per week had 92% lower transmission [6]. This was subsequently supported by findings from the 2015 open-label extension (iPrEx OLE), which found that no participants with TDF/FTC blood levels indicative of four or more pills per week contracted HIV, demonstrating the importance of good adherence [7].

The CDC estimates that almost half a million U.S. MSM are PrEP candidates, however PrEP has not been scaled up to achieve a population-wide impact [8]. In spite of reinforced evidence of PrEP's ability to reduce the risk for HIV acquisition, PrEP uptake initially remained low due to limited awareness and access barriers [9]. Between 2012 and 2015, Gilead Sciences, Inc. (Foster City, CA), the sole manufacturer of TDF/FTC in the U.S., reported nearly 50,000 new PrEP prescriptions, an increase of over 500%, but with prominent discrepancies: only 7.5% of new users were under the age of 25 and only 10% were black [10].

Individuals who initiate daily oral PrEP may continue to face challenges related to adherence, particularly younger people [11]. In order to offset adherence barriers, new PrEP modalities will need to alleviate challenges specific to daily oral therapy, including remembering to take a pill consistently. The safety and acceptability of injectable PrEP, or cabotegravir, has been established [12, 13], and large-scale randomized controlled trials comparing injectable PrEP to a daily oral pill is underway to establish its efficacy among MSM (i.e., HPTN 083) and heterosexual women (i.e., HPTN 084) [14]. Injectable PrEP has the potential to prevent unintended dosing interruptions because an injection would only be required once every 2 months according to the current regimen under study [14]. Few studies have analyzed the perceived acceptability of injectable PrEP, particularly among those subpopulations most at risk for HIV [15–17], and to the best of our knowledge, no studies have examined acceptability of and preferences for injectable PrEP since trials have been undertaken and publicized. Understanding how to facilitate the incorporation of alternative medication regimens into individuals' schedules and lifestyles is essential to reducing HIV transmission.

The aim of this study was to assess differences in interest in and preference for oral versus injectable PrEP, and for reasons for not being interested in injectable PrEP, among a national sample of MSM in the U.S. Moreover, we examined variances in interest and preference by sociodemographics—particularly age and race/ethnicity—and behavioral factors,

given the disproportionate burden of new infections in racial and ethnic minorities and in the young.

Methods

Participants and Procedures

Data were collected from an anonymous online survey of adult (18 years of age or older) members of two MSM social/sexual networking apps. The study protocol and survey, conducted over 10 days in March 2016, was developed in collaboration with researchers at academic institutions, a community health center specializing in the care of MSM, and key personnel working with social/sexual networking platforms. A link to the survey was sent to desktop, mobile web and mobile app users who had been active in the past 90 days. In total, 16,466 members clicked the provided link to the survey, 4638 of whom consented and were eligible. Eligibility included: being 18 years of age or older, being assigned male sex at birth and/or identifying as male (i.e., cis-man, transgender man or transgender woman), ever having sex with another man, and being HIV-uninfected or not knowing one's HIV status. This study was approved by the Institutional Review Board of The Fenway Institute of Fenway Health in Boston, MA.

Study Instrument

In addition to sociodemographics, the measures for this study included history of PrEP use, interest in diverse PrEP modalities, and sexual risk behaviors. Participants took an average of 10 min to complete the survey. At the end of the survey, those who wished to be entered into a raffle for a chance to win one of three iPads were taken to a page separate from their survey responses to provide an email address.

Sociodemographics

Sociodemographics included age, race/ethnicity, health insurance status, education, and employment status.

Sexual and Condom Use Behaviors

Sexual and condom-use behaviors were measured using items adapted from previous MSM research studies [18] and included an inquiry of the number of male sexual partners in the past 3 months. Individuals who reported any intercourse with males in the past 3 months (i.e., “sexually active”) were asked the number of times they had condomless anal sex (CAS) with these partners. Respondents were then classified as: no CAS, one time, or two or more times.

PrEP Use and Modality Preferences

Prior PrEP use was assessed by asking: “Have you ever heard about PrEP (i.e., pre-exposure prophylaxis, medication taken by mouth BEFORE sex as protection against HIV infection)?” Those who responded affirmatively were then asked if they had ever taken PrEP. Participants were also provided with a short description of injectable PrEP: “Another form of PrEP that is currently being tested is an injection, or a shot, given by a doctor or nurse every 2 months. Instead of taking a pill by mouth every day, studies are underway to determine if having a shot every 2 months will offer protection against HIV.” Individuals were then asked how interested they would be in injectable PrEP (categorized into: very/somewhat interested versus neutral or somewhat/very uninterested), reasons they might not be interested in this modality (informed by our prior formative study [19]), level of difficulty of taking injectable PrEP compared to a daily pill as prescribed, and their preference for injectable PrEP compared to a daily, oral pill (categorized into: prefer injectable versus unsure versus prefer daily pill).

Statistical Analysis

Response percentages were calculated overall, as well as by interest in and preference for injectable PrEP, for sociodemographic characteristics and sexual behaviors. Chi squared tests were performed to examine differences in these measures by interest in and preference for injectable PrEP. To examine independent correlates of interest in and preference for injectable PrEP, multivariable binomial and multinomial logistic regression models were fit, respectively. All analyses were done in SAS v9.3.

As is common in online surveys, attrition occurred throughout the questionnaire. As a result, many sociodemographic characteristics, which were asked at the end of the survey, had substantial missing data. However, given the exploratory and descriptive nature of this study, we did not impute missing data, and missing observations were excluded.

Results

Of the 4638 who completed the survey, participants came from all 50 states, Washington DC, and four U.S. territories. Sample characteristics are described in Table 1. Briefly, 10.6% were 18–21 years old, 14.9% were 22–25 years old, and 13.7% were 26–29 years old. Nearly half of the respondents (47.7%) identified as white, 25.1% as black and 11.4% as Hispanic. One in eight (11.9%) did not have any health insurance and 16.1% had public health insurance (e.g., Medicaid/Medicare). More than half (52.8%) reported CAS two

Table 1 Sample characteristics

Measure	N	%
Age (n = 4638)		
18–21	490	10.6
22–25	690	14.9
26–29	636	13.7
30–39	1056	22.8
40–49	772	16.6
50 +	944	21.4
Race/ethnicity (n = 3397)		
White	1619	47.7
Black	854	25.1
Hispanic	386	11.4
Asian/Pacific Islander	244	7.2
Multiracial	244	7.2
Other	50	1.5
Insurance status (n = 3326)		
No insurance	397	11.9
Private	1983	59.6
Public	535	16.1
Other	411	12.4
Educational attainment (n = 3384)		
High school/GED or less	1377	40.7
College graduate	1193	35.2
Graduate/professional degree	814	24.1
Employment status (n = 3355)		
Full-time employment	1243	37.0
Not full-time employment	2112	63.0
Country of birth (n = 3364)		
United States	2976	88.5
Outside United States	388	11.5
Number of condomless anal sex acts, past 3 months (n = 3502)		
0	1281	36.6
1	371	10.6
2 +	1850	52.8
Oral PrEP experienced (n = 4630)		
No	3941	85.1
Yes	689	14.9

or more times in the past 3 months. Approximately 15% reported ever having used oral PrEP.

Interest in Injectable PrEP

Over two-thirds of respondents (73.2%) expressed interest in injectable PrEP; 44.7% were very interested and 28.5% were somewhat interested. Among those not interested in injectable PrEP, common reasons included: concern about long-acting side effects (50.8%), dislike of needles (30.0%), and dislike of having a foreign substance injected into their body (18.4%). Less common reasons were: not

feeling that they need it (14.4%) and not thinking it would work (7.8%). In bivariate analyses (Table 2), individuals who were interested in injectable PrEP were significantly more likely to: be 26–29 years old or 30–39 years old compared to 18–21 years old; be black or Hispanic compared to white; have completed high school or less compared to graduating college; report more CAS; and be oral PrEP experienced. In the multivariable model (Table 2), participants who reported being interested in injectable PrEP had higher odds of: being younger (e.g., aOR 18–21

vs. 50 + = 1.55, 95% CI 1.03–2.32); being black (aOR 1.44, 95% CI 1.14–2.09) or Hispanic (aOR 1.53, 95% CI 1.11–2.09) compared to white; engaging in more CAS (aOR for 2 + vs. 0 = 1.74, 95% CI 1.46–2.08); and previously using oral PrEP (aOR 2.64, 95% CI 2.00–3.49). Those who reported being interested in injectable PrEP had lower odds of: being a college graduate (aOR 0.79, 95% CI 0.64–0.97) compared to having less education than college.

Table 2 Factors associated with interest in injectable PrEP, bivariate and multivariable

Measure	Bivariate		Multivariable	
	N (%)	<i>p</i>	aOR (95% CI)	<i>p</i>
Age				
18–21	306 (63.7)	0.004	1.55 (1.03, 2.32)	0.037
22–25	468 (68.9)		1.54 (1.11, 2.12)	0.009
26–29	447 (71.4)		1.37 (1.00, 1.88)	0.049
30–39	749 (72.2)		1.30 (1.01, 1.68)	0.040
40–49	509 (66.8)		0.99 (0.77, 1.27)	0.940
50 +	650 (66.5)		1.0	
Race/ethnicity				
White	1148 (71.7)	< 0.001	1.0	
Black	670 (79.9)		1.44 (1.14, 1.82)	0.002
Hispanic	304 (80.4)		1.53 (1.11, 2.09)	0.009
Asian/Pacific Islander	178 (73.6)		1.16 (0.79, 1.71)	0.443
Multiracial	181 (74.2)		1.02 (0.72, 1.44)	0.901
Other	37 (75.5)		0.90 (0.45, 1.80)	0.773
Insurance status				
No insurance	300 (76.1)	0.222	1.0	
Private	1453 (73.9)		0.95 (0.71, 1.26)	0.712
Public	407 (78.1)		1.24 (0.89, 1.73)	0.201
Other	309 (76.1)		0.97 (0.69, 1.36)	0.850
Educational attainment				
High school/GED or less	1050 (77.5)	0.014	1.0	
College graduate	854 (72.5)		0.79 (0.64, 0.97)	0.022
Graduate/professional degree	602 (74.6)		0.97 (0.77, 1.23)	0.804
Employment status				
Full-time	916 (74.8)	0.777	1.0	
Not full-time	1569 (75.2)		1.17 (0.97, 1.43)	0.108
Country of birth				
United States	2204 (75.1)	0.955	1.0	
Outside United States	287 (74.9)		0.90 (0.67, 1.20)	0.467
Condomless anal sex acts, past 3 months				
0	842 (67.3)	< 0.001	1.0	
1	288 (79.3)		1.70 (1.27, 2.28)	< 0.0001
2 +	1461 (79.5)		1.74 (1.46, 2.08)	< 0.0001
Oral PrEP experienced				
Yes	563 (82.2)	< 0.001	2.64 (2.00, 3.49)	< 0.0001
No	2566 (66.3)		1.0	

Dependent variable = being very or somewhat interested in injectable PrEP, compared to being neutral, somewhat or very uninterested

Preference for Injectable PrEP Versus Daily Pill

Nearly half (47.2%) of respondents indicated that they would prefer injectable PrEP compared to 16.8% who preferred a daily pill and 36.0% who were unsure; moreover, 47.0% also indicated that injectable PrEP would be less difficult than a daily pill to take as prescribed. In bivariate analyses

(Table 3), participants that preferred injectable PrEP were significantly more likely to: be younger; be black or Hispanic compared to white; have completed high school or less compared to graduating college; be born outside of the U.S.; and engage in more CAS. In the multivariable, multinomial model (Table 3), respondents who reported preferring injectable PrEP to oral PrEP had higher odds of: being younger

Table 3 Factors associated with preference for injectable PrEP, bivariate and multivariable

Measure	Bivariate				Multivariable ^a			
	Prefer injectable PrEP	Unsure	Prefer oral pill	<i>p</i>	Prefer injectable PrEP aOR (95% CI)	<i>p</i>	Unsure aOR (95% CI)	<i>p</i>
Age	N (%)							
18–21	170 (53.3)	96 (30.1)	53 (16.6)	< 0.001	1.71 (1.05, 2.79)	0.031	0.98 (0.58, 1.65)	0.943
22–25	258 (49.3)	185 (35.4)	80 (15.3)		1.71 (1.14, 2.55)	0.010	1.32 (0.87, 1.99)	0.188
26–29	278 (52.2)	175 (32.8)	80 (15.0)		1.97 (1.33, 2.93)	0.001	1.18 (0.78, 1.77)	0.444
30–39	474 (52.7)	311 (34.6)	115 (12.8)		1.94 (1.41, 2.68)	< 0.001	1.19 (0.85, 1.66)	0.303
40–49	280 (43.1)	238 (36.6)	132 (20.3)		1.11 (0.81, 1.51)	0.528	0.87 (0.64, 1.20)	0.403
50 +	327 (38.0)	358 (41.6)	176 (20.4)		1.0		1.0	
Race/ethnicity								
White	635 (42.0)	594 (39.3)	282 (18.7)	< 0.001	1.0		1.0	
Black	423 (52.7)	275 (34.3)	104 (13.0)		1.58 (1.17, 2.12)	0.003	1.30 (0.95, 1.77)	0.097
Hispanic	213 (58.4)	100 (27.4)	52 (14.2)		1.45 (1.00, 2.12)	0.053	0.90 (0.60, 1.36)	0.626
Asian/Pacific Islander	102 (44.2)	94 (40.7)	35 (15.2)		1.18 (0.71, 1.96)	0.513	1.36 (0.81, 2.28)	0.244
Multiracial	113 (49.3)	75 (32.8)	41 (17.9)		1.03 (0.67, 1.57)	0.906	0.84 (0.54, 1.31)	0.438
Other	23 (47.9)	18 (37.5)	7 (14.6)		1.12 (0.46, 2.73)	0.801	1.15 (0.46, 2.85)	0.768
Insurance status								
No insurance	182 (49.1)	137 (36.9)	52 (14.0)	0.511	1.0		1.0	
Private	895 (48.0)	660 (35.4)	310 (16.6)		1.07 (0.74, 1.55)	0.704	0.75 (0.51, 1.10)	0.137
Public	243 (48.2)	182 (36.1)	79 (15.7)		1.11 (0.73, 1.68)	0.639	0.89 (0.58, 1.36)	0.581
Other	163 (43.1)	145 (38.4)	70 (18.5)		0.67 (0.44, 1.04)	0.072	0.73 (0.47, 1.14)	0.168
Educational attainment								
High school/GED or less	649 (51.2)	415 (32.7)	204 (16.1)	0.008	1.0		1.0	
College graduate	497 (44.2)	440 (39.1)	187 (16.6)		0.91 (0.71, 1.18)	0.481	1.20 (0.92, 1.56)	0.178
Graduate/professional degree	357 (46.1)	291 (37.5)	127 (16.4)		0.98 (0.73, 1.32)	0.899	1.12 (0.83, 1.52)	0.465
Employment status								
Full-time	549 (47.4)	412 (35.6)	197 (17.0)	0.815	1.0		1.0	
Not full-time	946 (47.5)	722 (36.3)	322 (16.2)		0.92 (0.72, 1.18)	0.511	0.92 (0.71, 1.18)	0.509
Country of birth								
United States	1299 (46.6)	1021 (36.7)	465 (16.7)	0.051	1.0		1.0	
Outside United States	195 (53.4)	117 (32.1)	53 (14.5)		1.27 (0.88, 1.85)	0.207	1.02 (0.69, 1.52)	0.909
Condomless anal sex acts, past 3 months								
0	513 (43.8)	433 (36.9)	226 (19.3)	0.001	1.0		1.0	
1	165 (48.1)	114 (33.2)	64 (18.7)		1.11 (0.78, 1.57)	0.559	0.84 (0.59, 1.21)	0.358
2 +	873 (49.6)	638 (36.3)	249 (14.1)		1.52 (1.21, 1.91)	< 0.001	1.18 (0.93, 1.49)	0.165
Oral PrEP experienced								
Yes	293 (47.0)	258 (41.4)	72 (11.6)	< 0.001	1.39 (1.02, 1.89)	0.038	1.63 (1.18, 2.23)	0.003
No	1494 (47.2)	1105 (34.9)	564 (17.8)		1.0		1.0	

^aMultinomial regression, dependent variable = preferring injectable PrEP or being unsure, compared to preferring a daily oral pill

(e.g., aOR 18–21 vs. 50 + = 1.71, 95% CI 1.05–2.79); being black (aOR 1.58, 95% CI 1.17–2.12) or Hispanic (aOR 1.45, 95% CI 1.00–2.12) compared to white; engaging in more CAS (aOR for 2 + vs. 0 = 1.52, 95% CI 1.21–1.91); and being oral PrEP experienced (aOR 1.39, 95% CI 1.02–1.89). Compared to those who preferred a daily oral pill, those who reported being unsure about their preference had higher odds of being oral PrEP experienced (aOR 1.63, 95% CI 1.18–2.23).

Discussion

Social inequities in HIV infection are well-documented [1–3]. PrEP has the potential to decrease the number of new infections. However, currently PrEP is only available as a daily pill, and uptake data suggests that those most at risk for HIV, including youth and racial/ethnic minorities, are less likely to initiate PrEP [10]. Among those who initiate PrEP, studies also indicate that adherence is lower for younger and racial/ethnic minority individuals [20]. As such, in order to reduce demographic imbalances in HIV transmission, it is essential to develop diverse, effective prevention modalities that are acceptable to disproportionately affected groups.

Regardless of its efficacy, if injectable PrEP is not acceptable to those most in need, its reach and impact will be limited and may in fact widen sociodemographic gaps. In our study, nearly half expressed a preference for injectable PrEP; a smaller proportion than a study conducted among men in New York City [15] but similar levels to a national study conducted in 2014 [17]. Nearly one-third of respondents reported being unsure about their preference for injectable or oral PrEP, suggesting a need for further PrEP education and outreach, particularly delineating potential advantages and disadvantages of the distinct modalities for individuals and their personal contexts.

Moreover, results of our survey of a large sample of MSM in the U.S. suggest that some subgroups of individuals who are at the highest risk for HIV infection and have the lowest uptake of and adherence to oral PrEP—including black and Hispanic MSM, younger MSM, and individuals with higher behavioral risk—are most likely to be interested in and prefer injectable PrEP to oral PrEP. If the clinical trials demonstrate efficacy of injectable PrEP, and if injectable PrEP access and uptake among younger, black and Hispanic MSM reflects the level of interest that was seen in this study, this new modality could profoundly curtail the HIV epidemic in the U.S.

Given these findings, it is important that promotional efforts for injectable PrEP, if proven efficacious and approved by the FDA, consider how to best engage YMSM and racial/ethnic minorities. Actions may include developing diverse and inclusive advertisements, considering

culturally-relevant motivations for using PrEP, addressing culturally-specific stigma related to PrEP use, and performing focused outreach in communities most affected by HIV [21, 22].

Limitations

Results should be interpreted in light of the limitations. We collected survey data online and based on self-report, which may have introduced non-response bias and social desirability bias. We are not able to assess the potential of differential non-response, and if participation and non-response were not random, our results may not be fully representative of the target population. Social desirability bias may have resulted in misclassification of important measures; however, because this survey was self-administered and anonymous, social desirability is likely limited. There were missing data for some measures; however, levels of missing data were comparable to those observed in other self-administered surveys of MSM online [23, 24]. Moreover, assessment of interest and preferences for injectable PrEP remain hypothetical and may not translate to real-life uptake. Relatedly, when assessing their preference for a daily oral pill versus injectable PrEP, participants were operating under the assumption that oral PrEP is an available medication and injectable PrEP is still experimental. Therefore, those who preferred oral PrEP may have done so because of assumptions about superior safety and efficacy, potentially underestimating interest in and preference for injectable PrEP. Finally, participants were asked to choose between two prevention modalities—daily oral pill and injectable PrEP given every 2 months. Given the state of the research, it is likely that additional options will be available (e.g., on-demand PrEP, rectal gel), likely impacting preferences for and interest in injectable PrEP. This would be an important area for future research.

Conclusions

Among this sample of at-risk MSM recruited online, interest in and preference for injectable PrEP was highest among MSM at highest risk for HIV infection (i.e., younger age groups, racial/ethnic minorities, those with higher sexual risk behavior). As a result, if shown to be effective in ongoing clinical trials and if future uptake follows this current trend, injectable PrEP may be able to lessen social inequities in HIV transmission.

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Compliance with Ethical Standards

Conflicts of interest Dr. Kenneth H. Mayer has received unrestricted research grants from ViiV Healthcare, Inc. and Gilead Sciences. The remaining authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

Informed Consent Informed consent was obtained electronically from all individual participants included in the study. A waiver of documentation of consent was approved by the Fenway Health Institutional Review Board.

References

- Centers for Disease Control and Prevention. HIV surveillance report; vol. 27. 2016 Nov. <https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-report-2015-vol-27.pdf>. Accessed March 2017.
- Centers for Disease Control and Prevention. HIV in the United States: at a glance. 2016 Dec. <https://www.cdc.gov/hiv/statistics/overview/ataglance.html>. Accessed March 2017.
- Hergenrather KC, Emmanuel D, Durant S, Rhodes SD. Enhancing HIV prevention among young men who have sex with men: a systematic review of HIV behavioral interventions for young gay and bisexual men. *AIDS Educ Prev*. 2016;28(3):252–71.
- U.S. Public Health Service. Preexposure prophylaxis for the prevention of HIV infection in the United States: a clinical practice guideline. 2014 May. <https://www.cdc.gov/hiv/pdf/prep/guidelines2014.pdf>. Accessed March 2017.
- World Health Organization. Oral pre-exposure prophylaxis for preventing the acquisition of HIV. In: Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: recommendations for a public health approach, 2nd ed. 2016 Jun. <http://www.who.int/hiv/pub/arv/chapter3.pdf?ua=1>. Accessed March 2017.
- Grant RM, Lama JR, Anderson PL, et al. Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. *N Engl J Med*. 2010;363(27):2587–99.
- Molina JM, Capitant C, Spire B, et al. On-demand preexposure prophylaxis in men at high risk for HIV-1 infection. *N Engl J Med*. 2015;373(23):2237–46.
- Smith DK, Van Handel M, Wolitski RJ, et al. Vital signs: estimated percentages and numbers of adults with indications for pre-exposure prophylaxis to prevent HIV acquisition—United States, 2015. *Morb Mortal Wkly Rep*. 2015;64(46):1291–5.
- Krakower DS, Mimiaga MJ, Rosenberger JG, et al. 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.
- Bush S, Magnuson D, Rawlings MK, Hawkins T, McCallister S, Mera Giler R. Racial characteristics of FTC/TDF for pre-exposure prophylaxis users in the US. Presented at: ASM Microbe; 2016 Jun; Boston.
- Hosek SG, Rudy B, Landovitz R, et al. An HIV preexposure prophylaxis demonstration project and safety study for young MSM. *J Acquir Immune Defic Syndr*. 2017;74(1):21–9.
- Markowitz M, Frank I, Grant R, et al. ECLAIR: Phase 2A safety and PK study of cabotegravir LA in HIV-uninfected men. In: Conference on retroviruses and opportunistic infections (CROI), 22–25 February 2016, Boston. Abstract 106.
- Landovitz R, Li S, Grinsztejn B, et al. Safety, tolerability and pharmacokinetics of long-acting injectable cabotegravir in low-risk HIV-uninfected women and men: HPTN 077. International AIDS Society (IAS), 2017, Paris, France. Abstract 5481.
- U.S. National Institute of Allergy and Infectious Diseases. HPTN 083: a phase 2b/3 double blind safety and efficacy study of injectable cabotegravir compared to daily oral tenofovir disoproxil fumarate/emtricitabine (TDF/FTC), for pre-exposure prophylaxis in HIV-uninfected cisgender men and transgender women who have sex with men. 2016 Feb. <https://www.hptn.org/sites/default/files/2016-05/HPTN%20083-Final%20Version%201.0-02Feb2016.pdf>. Accessed March 2017.
- Meyers K, Rodriguez K, Moeller RW, Gratch I, Markowitz M, Halkitis PN. High interest in a long-acting injectable formulation of pre-exposure prophylaxis for HIV in young men who have sex with men in NYC: a P18 cohort substudy. *PLoS ONE*. 2014;9(12):e114700.
- Greene GJ, Swann G, Fought AJ, et al. Preferences for long-acting pre-exposure prophylaxis (PrEP), daily oral PrEP, or condoms for HIV prevention among U.S. men who have sex with men. *AIDS Behav*. 2017;21(5):1336–49.
- Parsons JT, Rendina HJ, Whitfield TH, Grov C. Familiarity with and preferences for oral and long-acting injectable HIV pre-exposure prophylaxis (PrEP) in a national sample of gay and bisexual men in the U.S. *AIDS Behav*. 2016;20(7):1390–9.
- Mimiaga MJ, Noonan E, Donnell D, et al. Childhood sexual abuse is highly associated with HIV risk-taking behavior and infection among MSM in the EXPLORE Study. *J Acquir Immune Defic Syndr*. 2009;51(3):340–8.
- Biello KB, Hosek S, Drucker MT, et al. Preferences for injectable PrEP among young U.S. cisgender men and transgender women and men who have sex with men. *Arch Sex Behav*. 2017.
- Liu AY, Cohen SE, Vittinghoff E. Preexposure prophylaxis for HIV infection integrated with municipal- and community-based sexual health services. *JAMA Intern Med*. 2016;176(1):75–84.
- Garcia J, Colson PW, Parker C, Hirsch JS. Passing the baton: community-based ethnography to design a randomized clinical trial on the effectiveness of oral pre-exposure prophylaxis for HIV prevention among black men who have sex with men. *Contemp Clin Trials*. 2015;45(Pt B):244–51.
- Golub SA, Gamarel KE, Surace A. Demographic differences in PrEP-related stereotypes: implications for implementation. *AIDS Behav*. 2017;21(5):1229–35.
- Sullivan PS, Khosropour CM, Luisi N, et al. Bias in online recruitment and retention of racial and ethnic minority men who have sex with men. *J Med Internet Res*. 2011;13(2):e38.
- Biello KB, Rosenberger JG, Novak DS, Robertson AM, Mayer KH, Mimiaga MJ. Epidemiology of sexual health in the virtual environment: a multinational online survey of Spanish- and Portuguese-speaking men who use an internet sexual networking site. *AIDS Behav*. 2014;18(9):1675–85.