HHS Public Access

Author manuscript

AIDS Behav. Author manuscript; available in PMC 2021 May 01.

Published in final edited form as:

AIDS Behav. 2020 May ; 24(5): 1304–1311. doi:10.1007/s10461-019-02722-2.

Demographic, behavioral, and geographic differences between men, transmen, and transwomen *currently* on PrEP, *former* PrEP users, and those having *never* used PrEP

Drew A. Westmoreland[1], **David W. Pantalone**[2,3], **Viraj V. Patel**[4], **Donald Hoover**[5], **Denis Nash**[1,6], **Christian Grov**[1,6,*]

[1]Institute for Implementation Science in Population Health (ISPH), City University of New York, USA

[2]Department of Psychology, University of Massachusetts, Boston, MA, USA

[3]The Fenway Institute, Fenway Health, Boston, MA, USA

[4]Division of General Internal Medicine, Montefiore Health System, Albert Einstein College of Medicine, Bronx, New York, USA

[5]Department of Statistics and Biostatistics, Rutgers University, New Brunswick, New Jersey, USA

[6]Graduate School of Public Health and Health Policy, City University of New York, USA

Abstract

Many recent studies have compared men currently taking PrEP to men not taking PrEP. However, less is known about demographic, behavioral, and geographic characteristics of men *formerly*, but not currently, taking PrEP. Using a 2017–2018 U.S. national, internet-based sample (n = 10,504) of men, transmen, and transwomen who have sex with men, we compared three groups based on their PrEP experiences. Results highlight individual-level financial and geo-contextual barriers to PrEP use that can inform prevention efforts to improve PrEP initiation and continuation for both PrEP-naïve and PrEP-experienced individuals, respectively.

Resumen:

Muchos estudios recientes han comparado a hombres que actualmente toman PrEP con hombres que no toman PrEP. Sin embargo, se conoce menos sobre las características demográficas, conductuales y geográficas de los hombres que antes, pero no actualmente, tomaban PrEP. Utilizando una muestra nacional de los EE. UU. obtenida de Internet entre el 2018–2018 (n = 10,504) de hombres, hombres transgénero y mujeres transgénero que tienen sexo con hombres, comparamos tres grupos basado en sus experiencias con PrEP. Los resultados destacan barreras financieras a nivel individual, y barreras geo-contextuales al uso de PrEP que pueden informar los

*Graduate School of Public Health and Health Policy, City University of New York, 55 W. 125th St., 7th Floor mailroom. New York, NY 10027 USA, [cgrov@sph.cuny.edu].

Conflict of interest: The authors declare that they have no conflict of interest.

esfuerzos de prevención para mejorar la iniciación y la continuación de PrEP tanto de individuos sin experiencia previa con PrEP como y aquellos con experiencia, respectivamente.

Keywords

Pre-exposure Prophylaxis, PrEP; Gay and bisexual men; sexual behavior; demographic characteristics

Introduction:

HIV remains a significant public health concern in the United States (U.S.), with an estimated 1.1 million Americans living with HIV.[1] HIV is particularly concerning among young men who have sex with men (MSM) who accounted for 66% of the nearly 40,000 new infections in 2017.[1] More effective public health campaigns, including those aimed at increasing the uptake of bio-behavioral interventions, are needed to effectively reduce the incidence of HIV each year and protect people who are at higher risk of contracting HIV.

Having received Food and Drug Administration (FDA) approval in 2012, anti-HIV medications given to HIV-negative individuals at higher risk for HIV, called pre-exposure prophylaxis (PrEP), have been found to be highly effective at reducing HIV acquisition from sexual contact when taken with high levels of adherence in various studies and across multiple populations.[2] Despite PrEP's proven effectiveness and support from leading public health agencies, PrEP uptake in the U.S. has been slow, with an estimated coverage of only 10% for CDC-indicated at-risk persons.[3,4]

Much research has focused on differences between current PrEP using MSM and MSM who have never used PrEP. However, fewer studies have investigated potential factors associated with PrEP discontinuation, or assessed differences between former and current PrEP users, or MSM not using PrEP.[5] The predominant focus within PrEP research, outside of PrEP use studies and surveillance, has been on the limitations of the medication's effectiveness and barriers to obtaining and maintaining PrEP prescriptions.[6–8] Despite this focus, there is unclear evidence of what contributes to PrEP discontinuation and limited acknowledgement of other individual and geo-contextual factors that may be associated with PrEP use. Therefore, the objectives of this brief report were: (1) to investigate demographic, behavioral, and geographic differences between three categories of PrEP experiences (i.e., never-, former-, and current-users), and (2) to determine the associations of geo-contextual factors with membership in each of these three PrEP groups.

Methods:

The Together 5000 Cohort:

Data were collected as part of enrollment for *Together 5000* (T5K), a U.S. national, internet-based cohort study of men, transmen, and transwomen. The purpose of this cohort is to identify missed opportunities for HIV prevention and PrEP uptake, as well as to build and maintain a cohort using limited interaction techniques (e.g. web-based surveys, mail-in HIV testing kits). Using ads appearing on men-for-men geosocial networking smartphone

applications, recruitment began in October 2017 and concluded in June 2018. The cohort and its enrollment procedures have been fully described elsewhere.[9] Here, we describe the characteristics of the cohort and procedures of the study relevant to the current analyses. Of note, to be eligible for enrollment in T5K participants could not be currently taking PrEP. The other core eligibility criteria for enrollment specified that participants were aged 16 to 49; had at least two male sex partners in the past three months; were not currently participating in an HIV vaccine or PrEP clinical trial; lived in the U.S. or its territories; were not known to be HIV-positive; had a gender identity other than cisgender female; and met at least one other criteria indicating that they engaged in higher risk sexual behaviors which are listed elsewhere.[9]

Study population and outcome definitions:

The study population (n = 10,504) for the current analyses included participants who met all eligibility criteria and were enrolled in the T5K cohort (n = 8,777), and participants who participated in the T5K cohort screening survey and met all inclusion criteria *except* that they were taking PrEP at the time of enrollment (n = 1,727). Of the T5K enrolled participants (n = 8,777), 14% (n = 1,252) had previously taken PrEP but had discontinued use at time of enrollment. These are our "former PrEP users." The remainder of our cohort-enrolled participants (n = 7,525) reported *never* having been on PrEP. These participants were considered to be "PrEP-naïve." As indicated, the third comparison group were those screened participants not enrolled in T5K because they were taking PrEP at time of enrollment (exclusion criteria). These participants constituted the "current PrEP users." These three PrEP experiences—former PrEP users, PrEP-naïve, and current users—defined our categories for analyses.

Covariates:

All covariates used for this report were selected *a priori* from the literature for suspected or known associations with PrEP use and collected as part of the T5K cohort enrollment survey. Covariates included the following demographic characteristics: gender identity (cisgender-male, transfemale, transmale), race/ethnicity, sexual orientation (gay, bisexual, other), employment status, highest level of education, current annual income, zip code, and housing instability in the past five years. Participants also reported on sexual health behaviors related to HIV risk status: last HIV test date and result, experience with PrEP, number of HIV-negative and HIV-positive male sex partners, the number of times having receptive and insertive condomless anal sex (CAS) with a man, and engagement in sex work in the past three months. In addition to directly assessed measures, we used zip code data to create two additional variables: U.S. region of residence and whether or not participants' state of residence had expanded Medicaid under the Affordable Care Act (ACA). The states and the District of Columbia (DC) were coded as having Medicaid expansion if they had adopted the expansion and extended coverage prior to October 2017 (n = 32).[10] States that had not adopted the expansion, were still debating expansion, or had adopted expansion but not yet extended coverage by October 2017 were marked as non-adopters/no coverage (n = 19).[10]

Analyses:

Our first aim was to compare the three groups: (1) current PrEP users (n = 1,727), (2) those who used PrEP in the past but were not on PrEP at time of screening ("former PrEP users," n = 1,252), and (3) those having never used PrEP ("PrEP-naïve individuals," n = 7,525). We calculated descriptive statistics for demographic characteristics for categorical (frequencies, percentages) and continuous (means, standard deviations) variables, and tested for differences between the three PrEP groups—current PrEP users, PrEP naive, and former PrEP users—using chi-squared and t-tests, as appropriate. To account for potential errors related to multiple comparisons, we calculated a conservative Bonferroni-adjusted significance level ($\alpha \approx 0.02$) for multi-group comparisons ($n = 3$); however, two of our comparisons used the same reference group (i.e. PrEP-naïve). We included all variables that were significantly ($p \leq 0.02$) associated with PrEP status in bivariate analyses in subsequent regression analyses to assess the associations of PrEP experience with demographic characteristics, sexual behaviors, and geographic factors.

We used three multivariable, hierarchical (participants nested in regions), adjusted logistic regression models to describe associations of all considered factors, and between- and within-region effects, for three PrEP group comparisons: current PrEP users vs. PrEP-naïve individuals; current PrEP users vs. former PrEP users; and former PrEP users vs PrEP-naïve individuals. We report adjusted odds ratios (aORs), 95% confidence intervals (95% CIs), and p-values for all associations (Table 1). The results presented in-text will focus on the covariate-adjusted model results. Analyses were completed using SAS 9.4.

Results:

Brief description of the sample:

Table I presents results from all analyses. The average age of our participants was 30.9 (SD = 7.9, range 16–49), and the majority of our study participants identified as cisgender-men (97.7%). Nearly half identified as being persons of color (49.9%), and most identified as gay, queer, or homosexual (84.6%). Almost two-thirds (63.3%) were employed full-time, many reported having some college or an associate degree (42.5%), and many made between $20,000 and $49,999 annually (39.6%). Almost half reported living in the South (47.3%) and just over half lived in a Medicaid expansion state (53.2%). One-fifth (20.2%) reported being unstably housed in the past five years, and 14.3% reported having engaged in sex work in the past three months. Just over half (51.1%) reported that their last HIV test had been in the previous six months, and the average number of recent (< 3 months) sexual partners reported during that time was 6.6 (SD = 9.7).

Current PrEP users versus PrEP-Naïve individuals:

Compared to PrEP-naïve (reference group), participants who reported currently using PrEP were older (5-year increase, aOR = 1.20; 95% CI: 1.16–1.24), had earned at least a 4-year college degree (aOR = 1.91; 95% CI: 1.65–2.20, ref. high school diploma or GED), and reported a higher number of male sex partners in the past three months (aOR = 1.02; 95% CI: 1.01–1.03). Participants who reported lower annual income levels (less than $20,000 aOR = 0.47, 95% CI: 0.37–0.59; $20,000 to $49,999 aOR = 0.69, 95% CI: 0.6–0.8, ref.

$50,000 or more), identified as bisexual (aOR = 0.67; 95% CI: 0.62–0.72, ref. gay, queer, or homosexual), experienced being unstably housed in the past five years (aOR = 0.79; 95% CI: 0.65–0.96), last tested for HIV more than six months prior to enrollment, lived in a state without Medicaid expansion (aOR = 0.62; 95% CI 0.5–0.76), and lived in the Midwest (aOR = 0.8, 95% CI : 0.76–0.84 ref. Northeast), West (aOR = 0.8, 95% CI: 0.77–0.83), or other U.S. regions or territories (aOR = 0.48. 95% CI: 0.46–0.5) had lower odds of being current PrEP users compared to PrEP-naive.

Current PrEP users versus former PrEP users:

Compared to former PrEP users (reference group), current PrEP users were older (5-year increase, aOR = 1.19; 95% CI: 1.15–1.23) and had higher numbers of recent male sex partners in the past three months (aOR = 1.02; 95% CI: 1.01–1.03). Participants who identified as gender non-binary (aOR = 0.29; 95% CI: 0.11–0.77, ref. cismen), made less than $50,000 in annual income (less than $20,000 aOR = 0.7, 95% CI: 0.59–0.83; $20,000 to $49,999 aOR = 0.81, 95% CI: 0.69–0.95), were unemployed (aOR = 0.72, 95% CI: 0.6–0.86, ref. employed full-time), had not completed a high school degree (aOR = 0.63, 95% CI: 0.49–0.82), lived in a state without Medicaid expansion (aOR = 0.75, 95% CI: 0.6–0.94), had experienced housing instability in the past five years (aOR = 0.54; 95% CI: 0.43–0.69), had performed sex work in the past three months (aOR 0.73; 95% CI: 0.66–0.82), and tested for HIV more than six months prior to enrollment were less likely to be current PrEP users than former users.

Former PrEP users versus PrEP-naïve individuals:

Our final model compared former PrEP users and PrEP-naïve participants (reference group). Of note, these two groups collectively represent those who ultimately enrolled in the *T5K* cohort, since being a current PrEP user was an exclusion criterion. Compared to participants who reported never using PrEP, former PrEP users had higher odds of identifying as gender non-binary (aOR = 2.03; 95% CI: 1.44–2.86), identifying as a cisgender-male, reporting being unemployed (aOR = 1.43; 95% CI: 1.11–1.83), having at least a 4-year college degree (aOR = 1.5; 95% CI: 1.25–1.79), living in the Northeastern U.S., having experienced housing instability in the past five years (aOR = 1.36; 95% CI: 1.27–1.46), engaging in sex work in the past three months (aOR = 1.25; 95% CI: 1.10–1.43), and reporting higher numbers of receptive CAS acts in the past three months (aOR = 1.00; 95% CI: 1.00–1.01). However, participants who reported making less than $20,000 annually (aOR = 0.79, 95% CI: 0.68–0.92) and those who tested for HIV more than six months prior to enrollment were less likely to be former PrEP users.

Discussion:

The primary aim of this study was to examine demographic, behavioral, and geographic differences between three groups of men, transmen, and transwomen who have sex with men based on their PrEP experiences—current users, former users, and PrEP-naïve. The major contribution of this report is to emphasize the importance of access to PrEP based on our findings. Across all group comparisons, geography played an important role. PrEP-naïve participants had higher odds of residing outside of the Northeastern U.S. compared to

current and former PrEP users. Additionally, current PrEP users had increased odds of residing in a state with Medicaid expansion compared to former PrEP users or PrEP-naïve. In our sample, former PrEP users reported indicators of lower SES status, or transitional SES status, compared to both current PrEP users and PrEP-naïve individuals. Taken together, these findings emphasize the importance of individual and geo-contextual access barriers for affordable healthcare and medication coverage.

When comparing current and former PrEP users with individuals who had never taken PrEP (PrEP-naïve), one interesting finding was that of the relevance of U.S. region of residence. Compared to participants living in the Northeast, participants residing in other U.S. regions had significantly lower odds of being current or former users compared to PrEP-naïve. One potential explanation for this is access and availability of PrEP in those areas. In many states, the number of HIV diagnoses and PrEP-eligible MSM outnumber the amount of PrEP-providing clinics.[11] Northeastern Census regions had higher clinic-to-PrEP-eligible-MSM ratios than other regions. For example, other studies have highlighted the disparities of PrEP access to need in the South. In 2017, the rate of HIV diagnoses was highest in the Southern U.S. region (16.1 per 100,000 persons),[1] however the region contained only a quarter (25.7%) of publicly listed PrEP-providing clinics.[11] Therefore, despite the fact that at-risk Southern residents would benefit greatly from the bio-behavioral prevention provided by PrEP, the South appears to have a large disparity in access to PrEP-providing clinics.[11] In our sample, our Southern study participants had lower odds of being former PrEP users and, although not statistically significant, our data suggest that Southern residents had lower odds of reporting current PrEP use. This finding may be due to the inclusion of Medicaid expansion state as a factor and its correlation with region, particularly the South.

An overlapping issue for PrEP access and availability is healthcare and prescription drug access. Current PrEP users (vs. former PrEP users or PrEP-naïve individuals) were more likely to live in a state with Medicaid expansion. Although the survey participants completed did not assess the *type* of insurance that participants had, it is notable that current users had higher odds of living in a Medicaid expansion state compared to PrEP-naïve and former users. In adjusted models, we did not find significant differences for residing in a Medicaid expansion state or not between former users and PrEP-naïve; however, we observed these differences between former users and PrEP-naïve in bivariate analyses, and 63% of former users were identified as living in a Medicaid expansion state. In the U.S., there are 2.2 million uninsured, non-elderly adults who fall in a Medicaid coverage gap due to lack of Medicaid expansion in their state.[12] Of these 2.2 million adults in the “coverage gap,” 89% live in the South.[12] Similarly, 52.6% of states who have not expanded Medicaid are also in the South. These findings related to region of residence and Medicaid expansion highlight the importance of environmental and social contexts on access to HIV bio-medical prevention interventions.

Another individual-level access barrier particularly impacting former PrEP users is financial instability. Compared to both current PrEP users and PrEP-naïve participants, former PrEP users seem to fit a pattern of lower or transitional SES status. Former PrEP users had higher odds of being unemployed, unstably housed, and engaging in recent sex work. All of these factors point to financial barriers that could prevent individuals from being able to access

appropriate healthcare and PrEP continuously or as needed. However, compared to PrEP-naïve individuals, former users had higher odds of being at least a college graduate, and lower odds of making less than $20,000 annually. These apparent contradictions to lower SES status could indicate that former users were unstably employed or experiencing employment transitions, given the associations of the previous low SES indicators of participants who reported using PrEP in the past. Specifically, unstable employment can create discontinuations in health care coverage and lead to disruptions in access to PrEP. These lapses of healthcare coverage would be particularly problematic for PrEP-eligible individuals who do not have access to alternative forms of affordable healthcare coverage in their states, such as Medicaid expansion.

A few final observations from our results: 1) older participants had a higher odds of currently (compared to former users and naïve) or formerly using PrEP (compared to naïve), 2) participants with higher numbers of recent sex partners had higher odds of currently using PrEP compared to both former PrEP users and PrEP-naive, and 3) participants who tested longer ago had lower odds of currently (compared to former users and naïve) or formerly using PrEP (compared to naïve). First, the results presented and discussed in the previous paragraphs highlight individual (economic) and systemic (lack of access) barriers for PrEP candidates to access and use PrEP, however these barriers may even be more pronounced for young people.[8] There are real structural barriers to getting younger people access to PrEP that go beyond the scope of the current study, however young people are, generally speaking, not financially independent. It is possible they do not have their own health insurance nor money to afford PrEP. For some young people, talking to their parents about PrEP or even feeling comfortable seeking PrEP while financially dependent on their parents is not an option for fear of their family's reactions. The other two findings continue to highlight that encouraging and engaging sexually active men, transmen, and transwomen in routine HIV testing can also provide opportunities to deliver HIV prevention and PrEP education.

Our results should be interpreted in the context of several limitations. First, this study was cross-sectional and only assessed factors associated with PrEP status at screening. In the future, we will be able to track PrEP uptake and discontinuation among those *enrolled* in the cohort; unfortunately, we are unable to track PrEP discontinuation among current (at time of screening) PrEP users (i.e., not eligible/enrolled in the cohort) due to lack of follow-up from failing to meet our cohort eligibility criteria. Second, in prioritizing brevity, our enrollment survey was necessarily limited in scope. Some measures—such as insurance status—were not included on the survey. However, they are included in later assessments and can be used in follow-up studies to longitudinally assess the insurance status of those who use or discontinue use of PrEP. We did assess different ways of determining potential Medicaid eligibility by state income requirements. However, due to the method in which annual income data was collected, this was not informative beyond the measures already included in our models. Despite missing some variables of interest, we were able to assess differences of a number of demographic and sexual behavior factors for three disparate groups of PrEP users to better describe the types of at-risk individuals who are using, not using, and discontinuing use of PrEP.

Conclusions:

Our findings illuminate differences in characteristics and sexual behaviors across these three groups of PrEP experiences. We found behavioral and demographic differences between current PrEP users, former PrEP users, and PrEP-naïve individuals that highlight important broader, geo-contextual access issues affecting PrEP use. Current users were significantly more likely to live in states where Medicaid expansion occurred, and PrEP-naïve individuals were significantly more likely to live in the South, the region most strongly impacted by the ongoing epidemic. Moving forward, our study will track how many former users and PrEP-naïve individuals will begin or restart PrEP use and further contribute to the literature on factors influencing PrEP use and continued use in high-risk populations. These findings also highlight the systemic structural barriers (e.g., income, housing instability) that may be keeping PrEP-naive individuals from uptake and supports the ongoing need to increase access to PrEP, particularly among those most socioeconomically vulnerable—including those who have discontinued PrEP use and remain at risk for HIV infection.

Acknowledgements:

Special thanks to additional members of the T5K study team: Matthew Stief, Caitlin MacCrate, Chloe Mirzayi, Sarah Kulkarni, Gloria Perez, Irvin Parker, & Pedro Carneiro. Thank you to Javier Lopez-Rios, a member of the T5K study team, for translating the abstract into Spanish. Special thanks to Alexa D'Angelo, a member of the T5K study team, and Evan Krueger for editing this report. Thank you to the program staff at NIH: Gerald Sharp, Sonia Lee, and Michael Stirratt. And thank you to the members of our Scientific Advisory Board: Sarit Golub, Gregorio Millett, Michael Camacho, Adam Carrico, Demetre Daskalakis, Sabina Hirshfield, Jeremiah Johnson, Claude Mellins, and Milo Santos. Finally, this work would not be possible without the participation T5K cohort members.

Funding

Together 5,000 was funded by the National Institutes of Health (UG3 AI 133675 - PI Grov). Viraj Patel was supported by a career development award (K23 MH 102118). Other forms of support include the CUNY Institute for Implementation Science in Population Health, the Einstein, Rockefeller, CUNY Center for AIDS Research (ERC CFAR, P30 AI 124414).

References:

1. Centers for Disease Control and Prevention, Division of HIV/AIDS Prevention, National Center for Health Statistics. HIV: Statistics Center. 2019; https://www.cdc.gov/hiv/statistics/overview/ataglance.html. Accessed August 2019.
2. Fonner VA, Dalglish SL, Kennedy CE, et al. Effectiveness and safety of oral HIV preexposure prophylaxis for all populations. AIDS (London, England). 2016;30(12):1973–1983.
3. Siegler AJ, Mouhanna F, Giler RM, et al. The prevalence of pre-exposure prophylaxis use and the pre-exposure prophylaxis–to-need ratio in the fourth quarter of 2017, United States. Annals of Epidemiology. 2018/06/15/ 2018;28(12):841–849. [PubMed: 29983236]
4. Centers for Disease Control and Prevention. US Public Health Service: Preexposure prophylaxis for the prevention of HIV infection in the United States—2017 Update: a clinical practice guideline. Atlanta, GA: U.S. Department of Health and Human Services;2018.
5. Whitfield THF, John SA, Rendina HJ, Grov C, Parsons JT. Why I Quit Pre-Exposure Prophylaxis (PrEP)? A Mixed-Method Study Exploring Reasons for PrEP Discontinuation and Potential Re-initiation Among Gay and Bisexual Men. AIDS and behavior. 2 05 2018;22(11):3566–3575. [PubMed: 29404756]
6. Marcus JL, Hurley LB, Dentoni-Lasofsky D, et al. Barriers to preexposure prophylaxis use among individuals with recently acquired HIV infection in Northern California. AIDS Care. 5 2018;31(5):1–9. [PubMed: 29776321]

7. Morgan E, Ryan DT, Newcomb ME, Mustanski B. High Rate of Discontinuation May Diminish PrEP Coverage Among Young Men Who Have Sex with Men. AIDS and behavior. 5 04 2018;22(11):3645–3648. [PubMed: 29728950]

8. Holloway IW, Dougherty R, Gildner J, et al. Brief Report: PrEP Uptake, Adherence, and Discontinuation Among California YMSM Using Geosocial Networking Applications. Journal of acquired immune deficiency syndromes. 2017 2017;74(1):15–20. [PubMed: 27552158]

9. Grov C, Westmoreland DA, Carneiro PB, et al. Recruiting vulnerable populations to participate in HIV prevention research: findings from the Together 5000 cohort study. Annals of epidemiology. 2019.

10. Henry J Kaiser Family Foundation. Health Reform. 2019; https://www.kff.org/state-category/health-reform/medicaid-and-health-reform-health-reform/. Accessed January, 2019.

11. Siegler AJ, Bratcher A, Weiss KM, Mouhanna F, Ahlschlager L, Sullivan PS. Location location location: an exploration of disparities in access to publicly listed pre-exposure prophylaxis clinics in the United States. Annals of Epidemiology. 2018/05/26/ 2018;28(12):858–864. [PubMed: 30406756]

12. Garfield R, Damico A, Orgera K. The Coverage Gap: Uninsured Poor Adults in States that Do Not Expand Medicaid. 2018 https://www.kff.org/medicaid/issue-brief/the-coverage-gap-uninsured-poor-adults-in-states-that-do-not-expand-medicaid/. Accessed October 29, 2018.

Table 1.

Results from descriptive analyses and heirarchical, multivariable logistic regression analyses comparing participants currently on PrEP, former PrEP users, and PrEP-naïve, Together 5000 (T5K), 2017–2018.

	Total		**Not enrolled**		**Enrolled**				**Model 1**			**Model 2**			**Model 3**		
	***n* = 10,504**		***n* = 1,727**		***n* = 8,777**												
			Currently on PrEP		**Never used PrEP**		**Former PrEP use**			**Current PrEP users vs PrEP-Naïve**			**Current PrEP users vs Former PrEP users**			**Former PrEP vs PrEP-Naïve**	
			n = 1,727		**n = 7,525**		**n = 1,252**			***Ref = PrEP-Naïve***			***Ref = Former PrEP users***			***Ref = PrEP-Naïve***	
Characteristic	***n***	***(%)***	***n***	***(%)***	***n***	***(%)***	***n***	***(%)***		***aOR***	***95% CI***	***p-value***	***aOR***	***95% CI***	***p-value***	***aOR***	***95% CI***	***p-value***
Demographic Characteristics																		
Gender									***									
Cis-man	10259	(97.7)	1705	(98.7)	7343	(97.6)	1211	(96.7)			Ref			Ref			Ref	
Trans-woman	65	(0.6)	2	(0.1)	59	(0.8)	4	(0.3)		0.28	0.10–0.82	0.02	0.39	0.03–5.18	0.48	0.56	0.11–2.75	0.47
Trans-man	63	(0.6)	10	(0.6)	44	(0.6)	9	(0.7)		1.27	0.41–3.88	0.68	0.86	0.44–1.67	0.66	1.34	0.78–2.31	0.28
Non-binary (male at birth)	117	(1.1)	10	(0.6)	79	(1.1)	28	(2.2)		0.82	0.50–1.35	0.43	0.29	0.11–0.77	0.01	2.03	1.44–2.86	<.0001
Race/Ethnicity									***									
White	5264	(50.1)	955	(55.3)	3672	(48.8)	637	(50.9)			Ref			Ref			Ref	
Black or African American	1311	(12.5)	155	(9.0)	1009	(13.4)	147	(11.7)		0.92	0.71–1.18	0.51	0.87	0.74–1.02	0.08	1.01	0.94–1.09	0.82
Latino	2608	(24.8)	381	(22.1)	1932	(25.7)	295	(23.6)		0.95	0.83–1.09	0.45	0.93	0.73–1.20	0.59	0.96	0.77–1.20	0.71
Asian or Pacific Islander	394	(3.8)	83	(4.8)	253	(3.4)	58	(4.6)		0.90	0.77–1.05	0.18	0.81	0.67–0.98	0.03	1.15	0.76–1.73	0.51
Multiracial/ Other	927	(8.8)	153	(8.9)	659	(8.8)	115	(9.2)		1.03	0.82–1.29	0.81	1.15	0.73–1.82	0.55	0.94	0.66–1.32	0.70
Sexual orientation									***									
Gay, Queer, Homosexual	8888	(84.6)	1574	(91.1)	6194	(82.3)	1120	(89.5)			Ref			Ref			Ref	
Bisexual	1488	(14.2)	142	(8.2)	1223	(16.3)	123	(9.8)		0.67	0.62–0.72	<.0001	1.03	0.85–1.26	0.74	0.63	0.49–0.81	0.0003
Other	128	(1.2)	11	(0.6)	108	(1.4)	9	(0.7)		0.60	0.30–1.18	0.14	1.89	0.45–7.96	0.38	0.42	0.22–0.81	0.01

	Total		Not enrolled		Enrolled				Model 1				Model 2			Model 3		
	n = 10,504		*n* = 1,727		*n* = 8,777													
			Currently on PrEP		Never used PrEP		Former PrEP use		Current PrEP users vs PrEP-Naïve				Current PrEP users vs Former PrEP users			Former PrEP vs PrEP-Naïve		
			n = 1,727		n = 7,525		n = 1,252		*Ref = PrEP-Naïve*				*Ref = Former PrEP users*			*Ref = PrEP-Naïve*		
Characteristic	***n***	***(%)***	***n***	***(%)***	***n***	***(%)***	***n***	***(%)***		***aOR***	***95% CI***	***p-value***	***aOR***	***95% CI***	***p-value***	***aOR***	***95% CI***	***p-value***
Employment Status (current)									***									
Full-time	6652	(63.3)	1257	(72.8)	4623	(61.4)	772	(61.7)			Ref			Ref			Ref	
Part-time	1345	(12.8)	185	(10.7)	980	(13.0)	180	(14.4)		1.17	0.99–1.39	0.06	0.95	0.79–1.15	0.60	1.23	0.99–1.53	0.06
Working or full-time student	1492	(14.2)	162	(9.4)	1182	(15.7)	148	(11.8)		1.14	0.99–1.30	0.06	1.10	0.90–1.34	0.36	1.00	0.82–1.22	0.98
Unemployed/ Other	1015	(9.7)	123	(7.1)	740	(9.8)	152	(12.1)		1.09	0.92–1.29	0.32	0.72	0.60–0.86	0.0004	1.43	1.11–1.83	0.005
Highest level of Education									***									
< High school diploma	283	(2.7)	14	(0.8)	238	(3.2)	31	(2.5)		0.75	0.52–1.08	0.12	0.63	0.49–0.82	0.001	1.32	0.92–1.90	0.13
High school diploma or GED	1516	(14.4)	125	(7.2)	1254	(16.7)	137	(10.9)			Ref			Ref			Ref	
Some college or associate degree	4467	(42.5)	518	(30.0)	3440	(45.7)	509	(40.7)		1.22	1.00–1.48	0.05	0.94	0.65–1.37	0.76	1.23	1.00–1.52	0.05
College graduate or higher	4238	(40.3)	1070	(62.0)	2593	(34.5)	575	(45.9)		1.91	1.65–2.20	<.0001	1.31	0.93–1.84	0.13	1.50	1.25–1.79	<.0001
Income									***									
Less than $20,000	3359	(32.0)	292	(16.9)	2703	(35.9)	364	(29.1)		0.47	0.37–0.59	<.0001	0.70	0.59–0.83	<.0001	0.79	0.68–0.92	0.003
$20,000-$49,999	4156	(39.6)	597	(34.6)	3047	(40.5)	512	(40.9)		0.69	0.60–0.80	<.0001	0.81	0.69–0.95	0.01	0.97	0.78–1.19	0.75
$50,000 or more	2989	(28.5)	838	(48.5)	1775	(23.6)	376	(30.0)			Ref			Ref			Ref	
Region									***									
Northeast	1671	(16.0)	396	(23.0)	1007	(13.4)	268	(21.5)			Ref			Ref			Ref	
South	4957	(47.3)	618	(36.0)	3854	(51.4)	485	(38.9)		0.84	0.69–1.02	0.08	1.20	1.00–1.44	0.05	0.64	0.55–0.75	<.0001
Midwest	1472	(14.1)	243	(14.1)	1050	(14.0)	179	(14.3)		0.80	0.76–0.84	<.0001	1.03	0.98–1.08	0.28	0.77	0.74–0.82	<.0001

	Total		Not enrolled		Enrolled					Model 1			Model 2			Model 3		
	n = 10,504		*n* = 1,727		*n* = 8,777													
			Currently on PrEP		Never used PrEP		Former PrEP use			Current PrEP users vs PrEP-Naïve			Current PrEP users vs Former PrEP users			Former PrEP vs PrEP-Naïve		
	n = 1,727				n = 7,525		n = 1,252			*Ref = PrEP-Naïve*			*Ref = Former PrEP users*			*Ref = PrEP-Naïve*		
Characteristic	***n***	***(%)***	***n***	***(%)***	***n***	***(%)***	***n***	***(%)***		***aOR***	***95% CI***	***p-value***	***aOR***	***95% CI***	***p-value***	***aOR***	***95% CI***	***p-value***
West	2293	(21.9)	453	(26.4)	1529	(20.4)	311	(24.9)		0.80	0.77–0.83	<.0001	0.99	0.97–1.00	0.11	0.81	0.77–0.85	<.0001
Pacific/US Territories/Other	78	(0.7)	9	(0.5)	64	(0.9)	5	(0.4)		0.48	0.46–0.50	<.0001	2.00	1.55–2.59	<.0001	0.55	0.49–0.61	<.0001
Medicaid Expansion State[§]									***									
Yes	5556	(53.2)	1152	(67.1)	3640	(48.7)	764	(61.2)			Ref			Ref			Ref	
No	4883	(46.8)	565	(32.9)	3834	(51.3)	484	(38.8)		0.62	0.50–0.76	<.0001	0.75	0.60–0.94	0.01	0.87	0.74–1.03	0.11
Housing instability									***									
Yes, within the last 5 years	2125	(20.2)	213	(12.3)	1601	(21.3)	311	(24.8)		0.79	0.65–0.96	0.02	0.54	0.43–0.69	<.0001	1.36	1.27–1.46	<.0001
No or not within the last 5 years	8379	(79.8)	1514	(87.7)	5924	(78.7)	941	(75.2)			Ref			Ref			Ref	
Sex work in the past 3 months									***									
Yes	1504	(14.3)	165	(9.6)	1127	(15.0)	212	(16.9)		0.97	0.81–1.17	0.75	0.73	0.66–0.82	<.0001	1.25	1.10–1.43	0.001
No	9000	(85.7)	1562	(90.5)	6398	(85.0)	1040	(83.1)			Ref			Ref			Ref	
Last HIV Test									***									
6 months or less	5369	(51.1)	1621	(93.9)	2907	(38.6)	841	(67.2)			Ref			Ref			Ref	
7–12 months ago	1690	(16.1)	76	(4.4)	1370	(18.2)	244	(19.5)		0.11	0.08–0.14	<.0001	0.16	0.12–0.22	<.0001	0.62	0.58–0.66	<.0001
A year ago or longer	2319	(22.1)	27	(1.6)	2145	(28.5)	147	(11.7)		0.02	0.02–0.03	<.0001	0.10	0.07–0.13	<.0001	0.23	0.21–0.25	<.0001
I have never been tested	1126	(10.7)	3	(0.2)	1103	(14.7)	20	(1.6)		0.01	0.00–0.02	<.0001	0.12	0.04–0.35	0.0001	0.08	0.05–0.13	<.0001
	Mean	*(SD)*	*Mean*	*(SD)*	*Mean*	*(SD)*	*Mean*	*(SD)*										
Age[*]	30.9	(7.9)	33.4	(7.3)	30.2	(8.0)	31.5	(7.1)	***	1.20	1.16–1.24	<.0001	1.19	1.15–1.23	<.0001	1.07	1.04–1.10	<.0001

	Total		Not enrolled		Enrolled					Model 1			Model 2			Model 3		
	n = 10,504		*n* = 1,727		*n* = 8,777													
			Currently on PrEP		Never used PrEP		Former PrEP use			Current PrEP users vs PrEP-Naïve			Current PrEP users vs Former PrEP users			Former PrEP vs PrEP-Naïve		
	n = 1,727				n = 7,525		n = 1,252			*Ref = PrEP-Naïve*			*Ref = Former PrEP users*			*Ref = PrEP-Naïve*		
Characteristic	***n***	***(%)***	***n***	***(%)***	***n***	***(%)***	***n***	***(%)***		***aOR***	***95% CI***	***p-value***	***aOR***	***95% CI***	***p-value***	***aOR***	***95% CI***	***p-value***
No. of recent (< 3 months) male sex partners**	6.6	(9.7)	9.7	(12.8)	5.8	(8.6)	7.3	(10.2)	***	1.02	1.01–1.03	<.0001	1.02	1.01–1.03	0.002	1.00	1.00–1.01	0.23
No. of receptive CAS acts**	4.6	(11.1)	6.9	(12.4)	4.0	(10.6)	5.2	(11.3)	***	1.02	1.00–1.04	0.13	1.01	1.00–1.02	0.18	1.00	1.00–1.01	<.0001
No. of insertive CAS acts**	4.6	(8.9)	6.5	(12.7)	4.1	(7.6)	5.3	(9.2)	***	1.01	1.00–1.02	0.13	1.00	0.99–1.00	0.06	1.01	1.00–1.02	0.07
No. of positive male partners**	0.9	(10.6)	2.2	(24.6)	0.6	(3.8)	1.1	(4.1)	***	1.01	0.97–1.05	0.61	1.01	0.97–1.06	0.60	1.00	0.99–1.02	0.39

*Age differences calculated for 5 year increase

**Recorded for the past 3 months

***Significant bivariate differences <0.01

§States that had not adopted the expansion, were still debating expansion, or had adopted expansion but not yet extended coverage by October 2017 were marked as non-adopters/no coverage

AIDS Behav. Author manuscript; available in PMC 2021 May 01.