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Awareness about and willingness to use long-acting injectable pre-exposure prophylaxis (LAI-PrEP) among people who use drugs

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Abstract

In the Bangkok Tenofovir Study of oral pre-exposure prophylaxis (PrEP; TDF/FTC), adherence was poor. Long-acting injectable pre-exposure prophylaxis (LAI-PrEP) for HIV prevention may help overcome adherence challenges and is currently being tested in clinical trials, but not in people who use drugs (PWUD), an important key population that remains highly vulnerable to HIV. Since PWUD are not currently included in trials of LAI-PrEP, we sought to examine awareness about LAI-PrEP and factors associated with willingness to use LAI-PrEP in this understudied population. Participants included 234 HIV-negative people with opioid use disorder and self-reported HIV-risk behaviors recruited from Connecticut's largest addiction treatment program. We analyzed data from a standardized assessment using audio computer-assisted self-interview (ACASI) to assess the independent factors associated with willingness to use LAI-PrEP. While only 25.6% of participants were aware of LAI-PrEP (67.1% had heard of oral PrEP), after being given a description of it, 73.5% were willing to use it, if it were available. Participants were most commonly concerned about long-term side effects (76.9%) of LAI-PrEP. Independent correlates of willingness to use LAI-PrEP were female sex (aOR=2.181, $p=0.018$), recent visit to healthcare provider (aOR=2.9, $p=0.023$), high perceived risk of acquiring HIV (aOR=3.3,

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$p=0.007$), and having previously taken oral PrEP (aOR=3.284, $p=0.017$). Findings suggest that PWUD are highly interested in PrEP, especially in LAI-PrEP formulations. Our results indicate the potential for LAI-PrEP, as an alternative to oral daily PrEP, to be implemented into existing evidence-based HIV-based HIV prevention efforts that target high-risk PWUD.

Keywords

Pre-exposure prophylaxis (PrEP); Long-acting injectable PrEP (LAI-PrEP); HIV prevention; People who use drugs (PWUD); Patient preferences; Substance use

1. Introduction

The HIV epidemic among people who use drugs (PWUD) in the U.S. has been declining, but amid a burgeoning opioid epidemic, communities are now increasingly vulnerable to and experiencing HIV outbreaks (Jones, Christensen, & Gladden, 2017; Mack, Jones, & Ballesteros, 2017; Mars, Bourgois, Karandinos, Montero, & Ciccarone, 2014; Peters et al., 2016; Schwetz, Calder, Fauci, Rosenthal, & Kattakuzhy, 2019; Van Handel et al., 2016). Recent HIV outbreaks linked to drug injection have introduced HIV into networks of PWUD and, thus, reversed decades of HIV prevention successes. Pre-exposure prophylaxis (PrEP; TDF/FTC) is one promising approach for preventing HIV infection among at-risk groups and is recommended for high-risk PWUD as part of an integrated HIV prevention package (CDC, 2017; WHO, 2015). PrEP for HIV prevention is especially useful when other evidence-based harm reduction programs for PWUD (e.g., syringe services programs, opioid agonist therapies) are either unavailable or poorly scaled-to-need. Oral PrEP, formulated as a single, daily pill, was first FDA-approved in 2012 following studies documenting its HIV prevention efficacy among key populations (e.g., PWUD, men who have sex with men; MSM) (Baeten et al., 2012; Choopanya, Martin, Suntharasamai, Sangkum, Mock, Leethochawalit, Chiamwongpaet, Kitisin, Natrujirote, Kittimunkong, et al., 2013; Grant et al., 2010; Thigpen et al., 2012; Van Damme et al., 2012). Challenges with oral PrEP persist, including slow uptake and suboptimal adherence and persistence, indicating the need for new delivery mechanisms.

Research is currently evaluating injectable formulations of antiretroviral drugs as candidate agents for use as long-acting injectable PrEP (LAI-PrEP) (Taylor, Tieu, Jones, & Wilkin, 2019). LAI-PrEP is an attractive alternative to oral PrEP (Haberer et al., 2015), especially among individuals for whom daily medication adherence is challenging. LAI-PrEP would be administered to patients as an intramuscular injection in a clinical setting under professional supervision. Although clinical trials remain in progress, early data suggest injections for LAI-PrEP would be spaced at similar time intervals as LAI-ART, which occur approximately every 8 weeks (Delany-Moretlwe & Hosseinipour, 2019; Landovitz, 2020). An appealing alternative, LAI-PrEP may be perceived as a simpler delivery system that can confer a consistent level of protection against HIV, unlike oral PrEP, for which efficacy can modulate greatly based on daily adherence (Harper, 2019; Jackson & McGowan, 2015). LAI-PrEP may also overcome privacy concerns for people who store their medications in discrete locations or by placing them in inconspicuous containers, like vitamin bottles, to

avoid stigmatization. It may also provide support for clinicians who lack confidence that PWUD can adhere to daily oral PrEP. Also, LAI-PrEP may be a more convenient option for PWUD patients, given the challenges of adhering to a daily pill-based regimen due to characteristics common among many PWUD, such as chronic substance use and neurocognitive impairment (Huedo-Medina, Shrestha, & Copenhaver, 2016; Shrestha & Copenhaver, 2016; Vik, Cellucci, Jarchow, & Hedt, 2004).

There is a growing literature on the willingness to use oral PrEP (TDF/FTC) in PWUD and MSM (Iniasta et al., 2018; Ojikutu et al., 2019; Patrick et al., 2017; Ransome et al., 2019; Shrestha, Altice, Huedo-Medina, Karki, & Copenhaver, 2017; R. Shrestha et al., 2017). Studies on the preference toward using or willingness to use LAI-PrEP, however, have mostly been focused on MSM (Cheng et al., 2019; Kerrigan et al., 2018; Meyers, Wu, Brill, Sandfort, & Golub, 2018; Meyers, Wu, Qian, et al., 2018). Two qualitative studies in PWUD, however, showed high acceptability and relevance of LAI-PrEP to alleviate many of the barriers PWUD face in taking daily oral PrEP (Allen et al., 2019; Biello et al., 2019; Footer et al., 2019). Quantitative studies examining the preferences for LAI-PrEP in PWUD, however, are lacking. Therefore, we sought to better understand awareness about and willingness to use LAI-PrEP as a potential modality for PrEP delivery in opioid-dependent PWUD. If LAI-PrEP proves to be effective and safe and becomes available in the U.S., understanding preferences for, and attitudes toward, its use among diverse at-risk populations will facilitate rapid scale-up and implementation.

2. Methods

2.1. Participants

We recruited 234 individuals between July 2018 and October 2019. Individuals were eligible if they were: a) 18 years or older; b) self-reported HIV-uninfected or HIV status unknown; c) reported drug- (i.e., sharing of injection equipment) or sex-related (i.e., condomless sex) HIV risk in the past 6 months; d) met DSM-V criteria for opioid use disorder; e) on methadone maintenance treatment; and f) able to understand, speak, and read English. All patients were stabilized on methadone to treat opioid dependence.

2.2. Study setting and procedures

We recruited participants from Connecticut's largest addiction treatment setting (APT Foundation, Inc.), using clinic-based advertisements and flyers, word-of-mouth, and direct referral from counselors. Trained research assistants conducted all screening, enrollment, and interview activities in a private room. We screened a total of 294 individuals for eligibility, with 234 (79.6%) meeting inclusion criteria. The majority of ineligibility was due to low levels of HIV risk. Following informed consent, all participants completed a 45-minute interview using audio computer-assisted self-interview (ACASI). We reimbursed all participants \$25 for their time. The Investigational Review Board (IRB) at the University of Connecticut approved the study protocol, and we received approval from the board of APT Foundation, Inc.

2.3. Measures

We assessed participants for social and demographic characteristics, including age, sex, sexual orientation, ethnicity, marital status, educational status, employment status, annual income, homelessness, visit to a healthcare provider, and current methadone dose. We used standardized scales to assess depression (scores 16 indicative of moderate to severe depression on the 20-item Center for Epidemiological Studies Depression Scale [CES-D; Radloff, 1977]); alcohol use disorders (AUD), using the validated 3-item Alcohol Use Disorders Identification Test for Consumption (AUDIT-C) (cut-offs 4 for men and 3 for women suggest the presence of an AUD) (Bush, Kivlahan, McDonell, Fihn, & Bradley, 1998); and an HIV risk assessment, adapted from NIDA's Risk Behavior Assessment (Dowling-Guyer et al., 1994), to measure several aspects of HIV risk behaviors, including measurement of "any" high-risk behavior (sexual or drug-related) in the past 30 days. We measured perceived risk of acquiring HIV by a single question, "*What do you think is your current risk of getting HIV?*" with a dichotomized response of "low" or "high". We assessed participants' satisfaction with previous HIV prevention methods using the question "*Are you satisfied with your current method of HIV protection (e.g., condom use, clean needle use, daily oral PrEP use)?*" with a dichotomized response of "yes" or "no".

We assessed participants' awareness ("*Before participating in this survey, have you ever heard of daily oral PrEP for protection against HIV?*") and prior use of daily oral PrEP ("*Have you ever used PrEP for protection against HIV?*") after we presented participants with a brief description of daily oral PrEP, administered daily per recommendations for PWUD.

Following these, we asked participants about their awareness about LAI-PrEP ("*Before participating in this survey, have you ever heard about the long-acting injectable PrEP for protection against HIV?*"). We assessed their interest in LAI-PrEP after providing a brief description of LAI-PrEP. After reviewing the description, we asked participants to respond to a question "*Suppose that LAI-PrEP is effective in preventing HIV when injected once every two months. Would you be interested in taking it?*" To better understand the pattern of reasoning and decision making around interest in LAI-PrEP use, we explored participants' perceived concerns related to uptake of LAI-PrEP. We asked participants to indicate their agreement on statements listing concerns related to uptake of LAI-PrEP.

2.4. Data analysis

We performed all data analyses using IBM SPSS v. 25. We computed descriptive statistics, including frequencies and percentages for categorical variables, and means and standard deviations for continuous variables. We conducted bivariate logistic regression analyses between each independent covariate and the dependent variable, willingness to use LAI-PrEP. We then included covariates significant at $p < 0.10$ in a multivariate logistic regression on willingness to use LAI-PrEP. We evaluated estimates for statistical significance based on 95% confidence intervals using $p < 0.05$. We assessed the goodness-of-fit of the final multivariate model using the Hosmer and Lemeshow Test (Hosmer, Hosmer, Le Cessie, & Lemeshow, 1997).

3. Results

3.1. Participant characteristics

Table 1 shows participant characteristics, stratified by their willingness to use LAI-PrEP. Most participants were in their early 40s, with most (74.4%) meeting screening criteria for moderate to severe depression and 31.2% meeting screening criteria for AUD. Almost half of the participants (44.8%) reported injecting illicit drugs in the past 30 days. Of those who reported injecting in the last 30 days, 18.4% reported sharing injection equipment. Of those who reported engaging in sexual activities (e.g., anal, vaginal, or oral) in the past 30 days (71.4%), 39.3% reported having multiple sex partners, and only 6.0% reported always using condoms with their sexual partners. Almost two-thirds of participants (62.0%) reported being satisfied with their current method of HIV prevention (e.g., condom use, clean needle use, PrEP use) and 25.2% perceived that they were at high risk of acquiring HIV.

Among 234 participants (Figure 1), 67.1% and 25.6% of participants reported having heard of oral PrEP and LAI-PrEP, respectively. Similarly, 25.6% had ever used oral PrEP for protection against HIV. Conversations with a healthcare provider (33.3%) and friends (29.9%) were reported as the top sources of PrEP knowledge. The most frequently reported concern about taking LAI-PrEP was the potential for long-term side effects (76.9%). Participants reported slightly less concern about the possibility that the efficacy of LAI-PrEP may wane (37.6%) or confer incomplete protection against HIV (33.3%), followed by the cost of LAI-PrEP (27.4%), fear or dislike of needles (24.8%), and having to return to the clinic for injection of LAI-PrEP every two months (20.5%).

3.2. Willingness to use long-acting injectable PrEP

More than two-thirds of participants (73.5%) reported that they would be willing to use LAI-PrEP to reduce their risk of HIV infection (Figure 1). While Table 1 shows the results of the bivariate logistic regression of being willing to use LAI-PrEP, Table 2 shows the results of the multivariate logistic regression associated with this outcome. Factors independently correlated with willingness to use LAI-PrEP included female sex (aOR=2.181, $p=0.018$), being engaged in healthcare (aOR=2.919, $p=0.023$), having high perceived risk for HIV transmission (aOR=3.255, $p=0.007$), and having ever used oral PrEP previously (aOR=3.284, $p=0.017$). We found none of the variables to be co-linear with each other.

4. Discussion

To our knowledge, this is the first quantitative survey study to evaluate the willingness to use LAI-PrEP for HIV prevention among PWUD. As the opioid crisis in the U.S. expands and HIV transmission outbreaks continue, the demand for PrEP in PWUD will likely increase. Clinicians, however, have not enthusiastically prescribed PrEP to PWUD, partially due to concerns of low adherence (Calabrese et al., 2019; Shrestha, Altice, Karki, & Copenhaver, 2017; Spector, Remien, & Tross, 2015). Findings here suggest that there is suboptimal awareness of oral PrEP and very low awareness of LAI-PrEP among PWUD. Future studies should further evaluate the acceptability of LAI-PrEP in PWUD, including scale-up in the

U.S., if available (K. Biello et al., 2018; Choopanya, Martin, Suntharasamai, Sangkum, Mock, Leethochawalit, Chiamwongpaet, Kitisin, Natrujirote, & Kittimunkong, 2013).

Despite that all participants in this sample reported injection and/or sexual risk behaviors, nearly two-thirds (62%) reported being satisfied with their current HIV prevention strategy. Considerable data point to this disconnect between risk-taking and perception (Khawcharoenporn et al., 2019; MacKellar et al., 2005; MacKellar et al., 2007; Maughan-Brown & Venkataramani, 2017; Seekaew et al., 2019). After learning more about LAI-PrEP, a large proportion of PWUD were willing to use it, although they expressed concerns about its efficacy, safety, and cost. This is consistent with findings from qualitative interviews with PWUD in other settings, in which participants reported LAI-PrEP to have numerous adherence and logistical advantages over oral PrEP, which must be taken daily (Allen et al., 2019; Biello et al., 2019; Footer et al., 2019).

Not surprisingly, we found that those who had previously used oral PrEP were more likely to be willing to use LAI-PrEP; however, the awareness about PrEP, irrespective of the route, was not associated with the willingness to use LAI-PrEP. This may reflect that PWUD who have taken oral PrEP previously are generally satisfied with the concept of PrEP, or it could indicate that this group had wanted PrEP, but were dissatisfied with it as an oral formulation. This difference also supports findings from qualitative research that found PWUD perceived LAI-PrEP as being easier to adhere to relative to oral PrEP (Allen et al., 2019; Biello et al., 2019; Footer et al., 2019). Other factors explored in other studies suggest that multilevel barriers to PrEP utilization in PWUD exist, including competing health priorities, stigma, and discrimination by healthcare providers who deem them unsuitable for PrEP and among other PWUD in their social network who perceive them as irresponsible and taking too many risks. Other barriers to PrEP utilization include suboptimal capacity for PrEP delivery for PWUD and interrupted care related to homelessness, transportation difficulties, and criminal justice involvement (K. B. Biello et al., 2018; Shrestha & Copenhaver, 2018). Therefore, the availability of LAI-PrEP may be an attractive alternative for those interested in PrEP and may provide a new option for HIV prevention.

It is important to note that female participants were significantly more willing to use LAI-PrEP than males. Females may have perceived injectable formulation, unlike an oral regimen, to provide sustained protection from HIV independent of individual behavior (e.g., daily pill-taking). From a biomedical perspective, this could be a game-changer because females must adhere to much higher levels of PrEP relative to males due to a higher adherence threshold of oral PrEP among females (Cottrell et al., 2016; Hendrix et al., 2016; Louissaint et al., 2013; Patterson et al., 2011). Though it merits further exploration, evidence from the contraceptive literature shows several parallels with females' interest in LAI-PrEP. First, females have used long-acting contraception in a variety of formulations for decades, including oral, injectable, and patch. Second, women may find LAI-PrEP more appealing, as it may reduce the stigma that one has multiple sex partners because she takes oral PrEP medications. Previous studies have shown that women who have experienced intimate partner violence, which is frequently reported among female PWUD (Meyer, Springer, & Altice, 2011), are more fearful of taking medications due to partner resistance (Braksmajer, Senn, & McMahon, 2016). Qualitative findings have suggested several pathways through

which partner violence may cause short-term lapses in contraception adherence, including stress, being forced to leave the home, or a partner who steals pills (Roberts et al., 2016). LAI-PrEP may be able to help women to overcome many of the challenges of using oral PrEP, and to improve the PrEP care continuum for women who use drugs—a marginalized, at-risk, and understudied group.

Future research should investigate whether those who are already engaged in healthcare are more likely to prefer LAI-PrEP. There is a long history of mistrust between PWUD and clinicians (Altice, Mostashari, & Friedland, 2001; Ostertag, Wright, Broadhead, & Altice, 2006), and it may be that those who engage in healthcare are most accepting of biomedical prevention, including new options. Notably, we recruited participants in the current study from an addiction treatment program, in which healthcare providers saw the participants regularly for their opioid use disorder. While participants in this study reported a high level of engagement with providers, mostly counselors, future research must focus on how clinicians can create an environment in which potential PrEP users can engage in dialogue with the clinicians. This includes communication around whether LAI-PrEP or oral PrEP is right for them in a given moment, particularly given the potential for healthcare-related stigma and discrimination, as well as medical mistrust that impedes access and uptake (K. Biello et al., 2018; K. B. Biello et al., 2018; Shrestha & Copenhaver, 2018). Although most participants in our study did not feel that attending LAI-PrEP appointments every two months would be a challenge, a clinician must navigate some concerns related to LAI-PrEP use (e.g., potential side effects and efficacy) during visits. As a cautionary note, studies of other long-acting treatments for alcohol or opioid use disorder show that PWUD often discontinue treatment after three months (I. Makarenko et al., 2019; J. Makarenko et al., 2017; Springer, Brown, Di Paola, & Altice, 2015).

It is important to note that individuals who stood to benefit the most from PrEP (i.e., those who perceived themselves to be at high risk for HIV acquisition) tended to be the most willing to use LAI-PrEP. This is consistent with prior studies among MSM (Cheng et al., 2019; Meyers, Wu, Qian, et al., 2018) as well as for oral PrEP (Roman Shrestha, Pramila Karki, et al., 2017). Our results suggest that participants are making a rational judgment about their risk levels when considering whether to use PrEP. This may indicate not only a concern about the risk of HIV infection but also a self-management response to their HIV risk behaviors, especially given that almost 40% of our sample reported not being satisfied with their current method(s) of HIV prevention. More research is needed, however, to better understand this finding, to understand participants' perceived and actual HIV risk, and to understand the implications of appropriate PrEP messaging in this subgroup of PWUD.

When interpreting our findings, readers should consider certain limitations. Our study relied on cross-sectional data, restricting our ability to infer the causal directions underlying the observed associations. The use of self-reported measures may have resulted in participant underreporting of socially undesirable behaviors (e.g., sexual or drug-related risk behaviors) or inconsistent reporting (e.g., mental health) because of stigma or fear of judgment. However, this is unlikely given the high risks that this sample reported and our use of ACASI for data collection. Additionally, we screened the PWUD in this study specifically for substantial risk and all were enrolled in methadone maintenance; therefore, our findings

may not be generalizable to PWUD in other settings. Notwithstanding these limitations, our results indicate high acceptability and potential relevance of LAI-PrEP as an alternative to oral daily PrEP for existing evidence-based HIV-based HIV prevention efforts that target high-risk PWUD.

5. Conclusion

Long-acting injectable pre-exposure prophylaxis (LAI-PrEP) may be an alternative to the oral form of PrEP currently prescribed to individuals at high-risk for HIV infection. PWUD are an important target population for HIV prevention and could greatly benefit from LAI-PrEP. If LAI-PrEP were found to be efficacious and it were provided for free, it could circumvent uptake and adherence challenges associated with daily oral PrEP, thereby reducing social disparities in HIV transmission in this underserved group. Unfortunately, the ongoing clinical trials to test the efficacy of LAI-PrEP do not target PWUD. The exclusion of this at-risk group from LAI-PrEP-related research and programmatic efforts represents a missed opportunity and indicates a vital avenue for future research.

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7. References

- Allen ST, O'Rourke A, White RH, Smith KC, Weir B, Lucas GM, ... Grieb SM (2019). Barriers and Facilitators to PrEP Use Among People Who Inject Drugs in Rural Appalachia: A Qualitative Study. *AIDS and Behavior*. doi:10.1007/s10461-019-02767-3
- Altice FL, Mostashari F, & Friedland GH (2001). Trust and the acceptance of and adherence to antiretroviral therapy. *Journal of Acquired Immune Deficiency Syndrome*, 28(1), 47–58. doi:10.1097/00042560-200109010-00008
- Baeten JM, Donnell D, Ndase P, Mugo NR, Campbell JD, Wangisi J, ... Celum C. (2012). Antiretroviral Prophylaxis for HIV Prevention in Heterosexual Men and Women. *New England Journal of Medicine*, 367(5), 399–410. doi:10.1056/NEJMoa1108524 [PubMed: 22784037]
- Biello KB, Bazzi AR, Mimiaga MJ, Biancarelli DL, Edeza A, Salhaney P, ... Drainoni ML (2018). Perspectives on HIV pre-exposure prophylaxis (PrEP) utilization and related intervention needs among people who inject drugs. *Harm Reduction Journal*, 15, 55. doi:10.1186/s12954-018-0263-5 [PubMed: 30419926]
- Biello KB, Edeza A, Salhaney P, Biancarelli DL, Mimiaga MJ, Drainoni ML, ... Bazzi AR (2019). A missing perspective: injectable pre-exposure prophylaxis for people who inject drugs. *AIDS Care*, 31(10), 1214–1220. doi:10.1080/09540121.2019.1587356 [PubMed: 30822103]
- Braksmajer A, Senn TE, & McMahon J. (2016). The potential of pre-exposure prophylaxis for women in violent relationships. *AIDS patient care and STDs*, 30(6), 274–281. [PubMed: 27286296]
- Bush K, Kivlahan DR, McDonell MB, Fihn SD, & Bradley KA (1998). The AUDIT alcohol consumption questions (AUDIT-C): an effective brief screening test for problem drinking. Ambulatory Care Quality Improvement Project (ACQUIP). *Alcohol Use Disorders Identification Test*. *Arch Intern Med*, 158(16), 1789–1795. doi:10.1001/archinte.158.16.1789 [PubMed: 9738608]
- Calabrese S, Ogburn D, Edelman JE, Mayer K, Magnus M, Kershaw T, ... Dovidio J. (2019). Provider biases against people who inject drugs in the context of PrEP clinical decision-making. Paper presented at the 2019 National HIV Prevention Conference, Atlanta, GA.

- CDC. (2017). US Public Health Service: Preexposure prophylaxis for the prevention of HIV infection in the United States—2017 Update: a clinical practice guideline. Retrieved from Atlanta, GA: <https://www.cdc.gov/hiv/pdf/risk/prep/cdc-hiv-prep-guidelines-2017.pdf>
- Cheng C-Y, Quaife M, Eakle R, Cabrera Escobar MA, Vickerman P, & Terris-Prestholt F. (2019). Determinants of heterosexual men's demand for long-acting injectable pre-exposure prophylaxis (PrEP) for HIV in urban South Africa. *BMC Public Health*, 19(1), 996. doi:10.1186/s12889-019-7276-1 [PubMed: 31340785]
- Choopanya K, Martin M, Suntharasamai P, Sangkum U, Mock PA, Leethochawalit M, ... Kittimunkong S. (2013). 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*, 381(9883), 2083–2090.
- Choopanya K, Martin M, Suntharasamai P, Sangkum U, Mock PA, Leethochawalit M, ... Vanichseni S. (2013). 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*, 381(9883), 2083–2090. doi:10.1016/S0140-6736(13)61127-7
- Cottrell ML, Yang KH, Prince HMA, Sykes C, White N, Malone S, ... Kashuba ADM (2016). A Translational Pharmacology Approach to Predicting Outcomes of Preexposure Prophylaxis Against HIV in Men and Women Using Tenofovir Disoproxil Fumarate With or Without Emtricitabine. *The Journal of Infectious Diseases*, 214(1), 55–64. doi:10.1093/infdis/jiw077 [PubMed: 26917574]
- Delany-Moretlwe S, & Hosseinipour M. (2019). Evaluating the Safety and Efficacy of Long-Acting Injectable Cabotegravir Compared to Daily Oral TDF/FTC for Pre-Exposure Prophylaxis in HIV-Uninfected Women. In: <https://ClinicalTrials.gov/show/NCT03164564>.
- Dowling-Guyer S, Johnson ME, Fisher DG, Needle R, Watters J, Andersen M, ... Tortu S. (1994). Reliability of Drug Users' Self-Reported HIV Risk Behaviors and Validity of Self-Reported Recent Drug Use. *Assessment*, 1(4), 383–392. doi:10.1177/107319119400100407
- Footer KHA, Lim S, Rael CT, Greene GJ, Carballa-Diéguez A, Giguere R, ... Sherman SG (2019). Exploring new and existing PrEP modalities among female sex workers and women who inject drugs in a U.S. city. *AIDS Care*, 31(10), 1207–1213. doi:10.1080/09540121.2019.1587352 [PubMed: 30822101]
- Grant RM, Lama JR, Anderson PL, McMahan V, Liu AY, Vargas L, ... Glidden DV (2010). Preexposure Chemoprophylaxis for HIV Prevention in Men Who Have Sex with Men. *The New England Journal of Medicine*, 363(27), 2587–2599. doi:10.1056/NEJMoa1011205 [PubMed: 21091279]
- Haberer JE, Bangsberg DR, Baeten JM, Curran K, Koechlin F, Amico KR, ... Goicochea P. (2015). Defining success with HIV pre-exposure prophylaxis: A prevention-effective adherence paradigm. *AIDS (London, England)*, 29(11), 1277.
- Harper KN (2019). One step closer to ultra-long-acting PREP? *Aids*, 33(3), N2. doi:10.1097/qad.0000000000002118
- Hendrix CW, Andrade A, Bumpus NN, Kashuba AD, Marzinke MA, Moore A, ... Patterson KB (2016). Dose Frequency Ranging Pharmacokinetic Study of Tenofovir-Emtricitabine After Directly Observed Dosing in Healthy Volunteers to Establish Adherence Benchmarks (HPTN 066). *AIDS Research and Human Retroviruses*, 32(1), 32–43. doi:10.1089/AID.2015.0182 [PubMed: 26414912]
- Hosmer DW, Hosmer T, Le Cessie S, & Lemeshow S. (1997). A comparison of goodness-of-fit tests for the logistic regression model. *Statistics in Medicine*, 16(9), 965–980. [PubMed: 9160492]
- Huedo-Medina TB, Shrestha R, & Copenhaver M. (2016). Modeling a Theory-Based Approach to Examine the Influence of Neurocognitive Impairment on HIV Risk Reduction Behaviors Among Drug Users in Treatment. *AIDS Behav*, 20(8), 1646–1657. doi:10.1007/s10461-016-1394-x [PubMed: 27052845]
- Iniesta C, Álvarez-del Arco D, García-Sousa LM, Alejos B, Díaz A, Sanz N, ... del Amo J. (2018). Awareness, knowledge, use, willingness to use and need of Pre-Exposure Prophylaxis (PrEP) during World Gay Pride 2017. *PLoS ONE*, 13(10), e0204738. doi:10.1371/journal.pone.0204738
- Jackson A, & McGowan I. (2015). Long-acting rilpivirine for HIV prevention. *Current opinion in HIV and AIDS*, 10(4), 253–257. [PubMed: 26049950]

- Jones CM, Christensen A, & Gladden RM (2017). Increases in prescription opioid injection abuse among treatment admissions in the United States, 2004–2013. *Drug and Alcohol Dependence*, 176, 89–95. [PubMed: 28531769]
- Kerrigan D, Mantsios A, Grant R, Markowitz M, Defechereux P, La Mar M, ... Murray M. (2018). Expanding the Menu of HIV Prevention Options: A Qualitative Study of Experiences with Long-Acting Injectable Cabotegravir as PrEP in the Context of a Phase II Trial in the United States. *AIDS and Behavior*, 22(11), 3540–3549. doi:10.1007/s10461-017-2017-x [PubMed: 29290075]
- Khawcharoenporn T, Mongkolkaewsub S, Naijitra C, Khonphiern W, Apisarnthanarak A, & Phanuphak N. (2019). HIV risk, risk perception and uptake of HIV testing and counseling among youth men who have sex with men attending a gay sauna. *AIDS Research and Therapy*, 16(1), 13–13. doi:10.1186/s12981-019-0229-z [PubMed: 31189481]
- Landovitz R. (2020). 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. In: <https://ClinicalTrials.gov/show/NCT02720094>.
- Louissaint NA, Cao Y-J, Skipper PL, Liberman RG, Tannenbaum SR, Nimmagadda S, ... Hendrix CW (2013). Single dose pharmacokinetics of oral tenofovir in plasma, peripheral blood mononuclear cells, colonic tissue, and vaginal tissue. *AIDS Research and Human Retroviruses*, 29(11), 1443–1450. doi:10.1089/aid.2013.0044 [PubMed: 23600365]
- Mack KA, Jones CM, & Ballesteros MF (2017). Illicit drug use, illicit drug use disorders, and drug overdose deaths in metropolitan and nonmetropolitan areas—United States. *American Journal of Transplantation*, 17(12), 3241–3252. [PubMed: 29145698]
- MacKellar DA, Valleroy LA, Secura GM, Behel S, Bingham T, Celentano DD, ... Young Men's Survey Study, G. (2005). Unrecognized HIV infection, risk behaviors, and perceptions of risk among young men who have sex with men: opportunities for advancing HIV prevention in the third decade of HIV/AIDS. *Journal of Acquired Immune Deficiency Syndromes* (1999), 38(5), 603–614. doi:10.1097/01.qai.0000141481.48348.7e [PubMed: 15793373]
- MacKellar DA, Valleroy LA, Secura GM, Behel S, Bingham T, Celentano DD, ... Young Men's Survey Study, G. (2007). Perceptions of lifetime risk and actual risk for acquiring HIV among young men who have sex with men. *AIDS and Behavior*, 11(2), 263–270. doi:10.1007/s10461-006-9136-0 [PubMed: 16791527]
- Makarenko I, Pykalo I, Springer SA, Mazhnaya A, Marcus R, Filippovich S, ... Altice FL (2019). Treating opioid dependence with extended-release naltrexone (XR-NTX) in Ukraine: Feasibility and three-month outcomes. *Journal of Substance Abuse Treatment*, 104, 34–41. doi:10.1016/j.jsat.2019.05.008 [PubMed: 31370983]
- Makarenko J, Pykalo I, Mazhnaya A, Marcus R, Fillipovich S, Dvoriak S, ... Altice FL (2017). Treating Opioid Dependence With Extended-Release Naltrexone (XR-NTX) in Ukraine: Feasibility and Three-Month Outcomes *Drug and Alcohol Dependence*, In Press.
- Mars SG, Bourgois P, Karandinos G, Montero F, & Ciccarone D. (2014). "Every 'never' I ever said came true": transitions from opioid pills to heroin injecting. *The International Journal on Drug Policy*, 25(2), 257–266. doi:10.1016/j.drugpo.2013.10.004 [PubMed: 24238956]
- Maughan-Brown B, & Venkataramani AS (2017). Accuracy and determinants of perceived HIV risk among young women in South Africa. *BMC Public Health*, 18(1), 42–42. doi:10.1186/s12889-017-4593-0 [PubMed: 28732496]
- Meyer JP, Springer SA, & Altice FL (2011). Substance abuse, violence, and HIV in women: a literature review of the syndemic. *Journal of Women's Health*, 20(7), 991–1006.
- Meyers K, Wu Y, Brill A, Sandfort T, & Golub SA (2018). To switch or not to switch: Intentions to switch to injectable PrEP among gay and bisexual men with at least twelve months oral PrEP experience. *PLoS ONE*, 13(7), e0200296. doi:10.1371/journal.pone.0200296
- Meyers K, Wu Y, Qian H, Sandfort T, Huang X, Xu J, ... Shang H. (2018). Interest in long-acting injectable PrEP in a cohort of men who have sex with men in China. *AIDS and Behavior*, 22(4), 1217–1227. doi:10.1007/s10461-017-1845-z [PubMed: 28707025]
- Ojikutu BO, Bogart LM, Mayer KH, Stopka TJ, Sullivan PS, & Ransome Y. (2019). Spatial Access and Willingness to Use Pre-Exposure Prophylaxis Among Black/African American Individuals in

the United States: Cross-Sectional Survey. *JMIR Public Health Surveill*, 5(1), e12405. doi:10.2196/12405

Ostertag S, Wright BRE, Broadhead RS, & Altice FL (2006). Trust and other characteristics associated with health care utilization by injection drug users. *J Drug Issues*, 36(4), 953–974. Retrieved from <http://www.scopus.com/scopus/inward/record.url?eid=2-s2.0-33846261216&partnerID=40&rel=R6.0.0>

Patrick R, Forrest D, Cardenas G, Opoku J, Magnus M, Phillips G 2nd, ... Kuo I. (2017). Awareness, Willingness, and Use of Pre-exposure Prophylaxis Among Men Who Have Sex With Men in Washington, DC and Miami-Dade County, FL: National HIV Behavioral Surveillance, 2011 and 2014. *Journal of Acquired Immune Deficiency Syndromes*, 75 Suppl 3, S375–S382. doi:10.1097/qai.0000000000001414 [PubMed: 28604442]

Patterson KB, Prince HA, Kraft E, Jenkins AJ, Shaheen NJ, Rooney JF, ... Kashuba ADM (2011). Penetration of tenofovir and emtricitabine in mucosal tissues: implications for prevention of HIV-1 transmission. *Science Translational Medicine*, 3(112), 112re114. doi:10.1126/scitranslmed.3003174

Peters PJ, Pontones P, Hoover KW, Patel MR, Galang RR, Shields J, ... Duwve JM (2016). HIV Infection Linked to Injection Use of Oxymorphone in Indiana, 2014–2015. *New England Journal of Medicine*, 375(3), 229–239. doi:10.1056/NEJMoa1515195 [PubMed: 27468059]

Radloff LS (1977). The CES-D Scale: A Self-Report Depression Scale for Research in the General Population. *Applied Psychological Measurement*, 1(3), 385–401. doi:10.1177/014662167700100306

Ransome Y, Bogart LM, Kawachi I, Kaplan A, Mayer KH, & Ojikutu B. (2019). Area-level HIV risk and socioeconomic factors associated with willingness to use PrEP among Black people in the U.S. South. *Annals of Epidemiology*. doi:10.1016/j.annepidem.2019.11.002

Roberts ST, Haberer J, Celum C, Mugo N, Ware NC, Cohen CR, ... Partners Pr EPST (2016). Intimate Partner Violence and Adherence to HIV Pre-exposure Prophylaxis (PrEP) in African Women in HIV Serodiscordant Relationships: A Prospective Cohort Study. *Journal of Acquired Immune Deficiency Syndromes* (1999), 73(3), 313–322. doi:10.1097/QAI.0000000000001093 [PubMed: 27243900]

Schwetz TA, Calder T, Fauci AS, Rosenthal E, & Kattakuzhy S. (2019). Opioids and Infectious Diseases: A Converging Public Health Crisis. doi:10.1093/infdis/jiz133

Seekaew P, Pengnonyang S, Jantarapakde J, Meksen R, Sungsing T, Lujintanon S, ... Phanuphak N. (2019). Discordance between self-perceived and actual risk of HIV infection among men who have sex with men and transgender women in Thailand: A cross-sectional assessment. *Journal of the International AIDS Society*, 22(12), e25430. doi:10.1002/jia2.25430

Shrestha R, Altice F, Karki P, & Copenhaver M. (2017). Developing an Integrated, Brief Biobehavioral HIV Prevention Intervention for High-Risk Drug Users in Treatment: The Process and Outcome of Formative Research. *Frontiers in Immunology*, 8(561). doi:10.3389/fimmu.2017.00561

Shrestha R, Altice FL, Huedo-Medina TB, Karki P, & Copenhaver M. (2017). Willingness to Use Pre-Exposure Prophylaxis (PrEP): An Empirical Test of the Information-Motivation-Behavioral Skills (IMB) Model among High-Risk Drug Users in Treatment. *AIDS and Behavior*, 21(5), 1299–1308. doi:10.1007/s10461-016-1650-0 [PubMed: 27990587]

Shrestha R, & Copenhaver M. (2016). The Influence of Neurocognitive Impairment on HIV Risk Behaviors and Intervention Outcomes among High-Risk Substance Users: A Systematic Review. *Frontiers in Public Health*, 4, 16–16. doi:10.3389/fpubh.2016.00016 [PubMed: 26904535]

Shrestha R, & Copenhaver M. (2018). Exploring the Use of Pre-exposure Prophylaxis (PrEP) for HIV Prevention Among High-Risk People Who Use Drugs in Treatment. *Frontiers in Public Health*, 6, 195. doi:10.3389/fpubh.2018.00195 [PubMed: 30062091]

Shrestha R, Karki P, Altice FL, Huedo-Medina TB, Meyer JP, Madden L, & Copenhaver M. (2017). Correlates of willingness to initiate pre-exposure prophylaxis and anticipation of practicing safer drug- and sex-related behaviors among high-risk drug users on methadone treatment. *Drug and Alcohol Dependence*, 173, 107–116. doi:10.1016/j.drugalcdep.2016.12.023 [PubMed: 28214391]

Spector AY, Remien RH, & Tross S. (2015). PrEP in substance abuse treatment: a qualitative study of treatment provider perspectives. *Substance Abuse Treatment Prevention and Policy*, 10, 1. doi:10.1186/1747-597x-10-1

- Springer SA, Brown SE, Di Paola A, & Altice FL (2015). Correlates of retention on extended-release naltrexone among persons living with HIV infection transitioning to the community from the criminal justice system. *Drug and Alcohol Dependence*, 157, 158–165. doi:10.1016/j.drugalcdep.2015.10.023 [PubMed: 26560326]
- Taylor BS, Tieu H-V, Jones J, & Wilkin TJ (2019). CROI 2019: advances in antiretroviral therapy. *Topics in Antiviral Medicine*, 27(1), 50–68. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/31137003> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6550357/> [PubMed: 31137003]
- Thigpen MC, Kebaabetswe PM, Paxton LA, Smith DK, Rose CE, Segolodi TM, ... Brooks JT (2012). Antiretroviral Preexposure Prophylaxis for Heterosexual HIV Transmission in Botswana. *New England Journal of Medicine*, 367(5), 423–434. doi:doi:10.1056/NEJMoa1110711 [PubMed: 22784038]
- Van Damme L, Corneli A, Ahmed K, Agot K, Lombaard J, Kapiga S, ... Taylor D. (2012). Preexposure Prophylaxis for HIV Infection among African Women. *New England Journal of Medicine*, 367(5), 411–422. doi:doi:10.1056/NEJMoa1202614 [PubMed: 22784040]
- Van Handel MM, Rose CE, Hallisey EJ, Kolling JL, Zibbell JE, Lewis B, ... Brooks JT (2016). County-Level Vulnerability Assessment for Rapid Dissemination of HIV or HCV Infections Among Persons Who Inject Drugs, United States. *Journal of Acquired Immune Deficiency Syndromes* (1999), 73(3), 323–331. doi:10.1097/QAI.0000000000001098 [PubMed: 27763996]
- Vik PW, Cellucci T, Jarchow A, & Hedt J. (2004). Cognitive impairment in substance abuse. *Psychiatr Clin North Am*, 27(1), 97–109, ix. doi:10.1016/s0193-953x(03)00110-2 [PubMed: 15062633]
- WHO. (2015). Guideline on when to start antiretroviral therapy and on pre-exposure prophylaxis for HIV. Retrieved from Geneva, Switzerland:

Highlights

- Long-acting injectable PrEP (LAI-PrEP) is currently being studied as an alternative form of oral PrEP for HIV prevention.
- We examined the awareness and willingness to use LAI-PrEP among people who use drugs (PWUD).
- While only 25.6% of participants were aware of LAI-PrEP, 73.5% were willing to use it, if made available.
- Findings indicate the potential relevance of LAI-PrEP as an alternative to oral daily PrEP for HIV prevention in PWUD.

Fig. 1:
PrEP-related variables (N=234).

Table 1:

Characteristics of participants and HIV transmission risk behaviors, stratified by willingness to use LAI-PrEP (Bivariate associations; N=234).

Variables	Entire Sample (N = 234)		Willingness to use LAI-PrEP ^e		OR ^f (95% CI ^g)	p
	Frequency	%	No (n = 62)	Yes (n = 172)		
Characteristics of participants						
Age: Mean (±SD), years ^a	42.7 (±10.2)		41.5 (±10.6)	43.1 (±10.0)	1.016 (0.987, 1.046)	0.283
Sex						
Male	119	50.9	40 (17.1)	79 (33.8)	-	-
Female	115	49.1	22 (9.4)	93 (39.7)	2.140 (1.174, 3.902)	0.013
Heterosexual sexual orientation						
No	49	20.9	12 (5.1)	37 (15.8)	-	-
Yes	185	79.1	50 (21.4)	135 (57.7)	0.876 (0.423, 1.803)	0.721
Ethnicity						
Non-White	86	36.8	22 (9.4)	64 (27.4)	-	-
White	148	63.2	40 (17.1)	108 (46.2)	0.928 (0.507, 1.700)	0.809
Currently married/living with partner						
No	183	78.2	46 (19.7)	137 (58.5)	-	-
Yes	51	21.8	16 (6.8)	35 (15.0)	0.734 (0.372, 1.449)	0.373
High school graduate						
No	65	27.8	16 (6.8)	49 (20.9)	-	-
Yes	169	72.2	46 (19.7)	123 (52.6)	0.873 (0.452, 1.686)	0.686
Employed						
No	205	87.6	52 (22.2)	153 (65.4)	-	-
Yes	29	12.4	10 (4.3)	19 (8.1)	0.646 (0.282, 1.478)	0.300
Income level						
< \$10,000	68	29.1	18 (7.7)	50 (21.4)	-	-
\$10,000	166	70.9	44 (18.8)	122 (54.1)	0.998 (0.527, 1.892)	0.996
Homeless ^b						
No	103	44.0	26 (11.1)	77 (32.9)	-	-

Variables	Entire Sample (N = 234)		Willingness to use LAI-PrEP ^e		OR ^f (95% CI ^g)	p
	Frequency	%	No (n = 62)	Yes (n = 172)		
Characteristics of participants						
Yes	131	56.0	36 (15.4)	95 (40.6)	0.891 (0.495, 1.603)	0.700
Visited healthcare provider ^b						
No	27	11.5	12 (5.1)	15 (6.4)	-	-
Yes	207	88.5	50 (21.4)	157 (67.1)	2.512 (1.103, 5.721)	0.028
Methadone Dose (mg): Mean (±SD) ^a	81.9 (±30.5)		86.9 (±31.2)	80.0 (±30.2)	0.992 (0.983, 1.002)	0.129
Moderate to severe depression						
No	60	25.6	16 (6.8)	44 (18.8)	-	-
Yes	174	74.4	46 (19.7)	128 (54.7)	1.012 (0.521, 1.966)	0.972
Alcohol use disorder						
No	161	68.8	45 (19.2)	116 (49.6)	-	-
Yes	73	31.2	17 (7.3)	56 (23.9)	1.278 (0.672, 2.430)	0.455
HIV transmission risk behaviors						
Duration of drug use: Mean (±SD) ^a years						
Used illicit drug ^c	18.4 (±10.1)		18.3 (±10.3)	18.4 (±10.1)	1.001 (0.973, 1.031)	0.926
No	74	31.6	22 (9.4)	52 (22.2)	-	-
Yes	160	68.4	40 (17.1)	120 (51.3)	1.269 (0.687, 2.344)	0.446
Injected any illicit drug ^c						
No	55	23.5	15 (9.4)	40 (25.0)	-	-
Yes	105	44.9	25 (15.6)	80 (80 (50.0)	1.200 (0.570, 2.526)	0.631
Shared injection equipment ^c						
No	62	26.5	15 (14.3)	47 (44.8)	-	-
Yes	43	18.4	10 (9.5)	33 (31.4)	1.053 (0.422, 2.631)	0.912
Engaged in sexual intercourse ^c						
No	67	28.6	18 (7.7)	49 (20.9)	-	-

Variables	Entire Sample (N = 234)		Willingness to use LAI-PrEP ^e		OR ^f (95% CI ^g)	p
	Frequency	%	No (n = 62)	Yes (n = 172)		
Characteristics of participants						
Yes	167	71.4	44 (18.8)	123 (52.6)	1.027 (0.541, 1.949)	0.935
Multiple sex partner ^c						
No	75	32.1	23 (13.8)	52 (31.1)	-	-
Yes	92	39.3	21 (12.6)	71 (42.5)	1.495 (0.749, 2.985)	0.254
Consistent condom use ^c						
No	153	65.4	41 (24.6)	112 (67.1)	-	-
Yes	14	6.0	3 (1.8)	11 (6.6)	1.342 (0.356, 5.054)	0.663
Engaged in transactional sex ^c						
No	121	51.7	36 (21.6)	85 (50.9)	-	-
Yes	46	19.7	8 (4.8)	38 (22.8)	2.012 (0.854, 4.736)	0.110
Sex under the influence of alcohol ^c						
No	94	40.2	29 (17.4)	65 (38.9)	-	-
Yes	73	31.2	15 (9.0)	58 (34.7)	1.725 (0.842, 3.533)	0.136
Perceived risk of HIV transmission						
Low	175	74.8	54 (23.1)	121 (51.7)	-	-
High	59	25.2	8 (3.4)	51 (21.8)	2.845 (1.264, 6.404)	0.012
Satisfied with current method of HIV prevention						
No	89	38.0	22 (9.4)	67 (28.6)	-	-
Yes	145	62.0	40 (17.1)	105 (44.9)	0.862 (0.471, 1.577)	0.630
PrEP-specific variables ^d						
Heard of oral PrEP						
No	77	32.9	28 (12.0)	49 (20.9)	-	-
Yes	157	67.1	34 (14.5)	123 (52.6)	2.067 (1.135, 3.766)	0.018
Ever used oral PrEP						
No	174	32.9	56 (23.9)	118 (50.4)	-	-

Variables	Entire Sample (N = 234)		Willingness to use LAI-PrEP ^e		OR ^f (95% CI ^g)	p
	Frequency	%	No (n = 62)	Yes (n = 172)		
Characteristics of participants						
Yes	60	25.6	6 (2.6)	54 (23.1)	4.271 (1.734, 10.520)	0.002
Heard of LAI-PrEP ^e						
No	174	74.4	50 (21.4)	124 (53.0)	-	-
Yes	60	25.6	12 (5.1)	48 (20.5)	1.613 (0.791, 3.290)	0.189

Note:

^aSD: standard deviation;

^bin the past 12 months;

^cin the past 30 days;

^dPrEP: pre-exposure prophylaxis;

^eLAI-PrEP: long-acting injectable PrEP;

^fodds ratio;

^gconfidence interval

Table 2:

Multivariate logistic regression models of factors associated with willingness to use LAI-PrEP (N=234).

Variables	Willingness to use LAI-PrEP ^c			<i>P</i>
	aOR ^c	95% CI ^d		
Sex				
Male	Ref	-	-	
Female	2.181	1.144, 4.159	0.018	
Visited healthcare provider (last 12 months) ^a				
No	Ref	-	-	
Yes	2.919	1.156, 7.370	0.023	
Perceived risk of HIV transmission				
Low	Ref	-	-	
High	3.255	1.372, 7.721	0.007	
Heard of oral PrEP ^b				
No	Ref	-	-	
Yes	1.202	0.618, 2.340	0.588	
Ever used oral PrEP				
No	Ref	-	-	
Yes	3.284	1.242, 8.684	0.017	
$R^2 = 0.180$				
Hosmer and Lemeshow Test: Chi-square = 3.079; $p = 0.929$				

Note:

^a in the past 12 months;^b PrEP: pre-exposure prophylaxis;^c LAI-PrEP: long-acting injectable PrEP;^d aOR: adjusted odds ratio;^e CI: confidence interval