HHS Public Access

Author manuscript

AIDS. Author manuscript; available in PMC 2022 January 01.

Published in final edited form as:

AIDS. 2021 January 01; 35(1): 131–139. doi:10.1097/QAD.0000000000002728.

Effect of Truvada lawsuit advertising on PrEP attitudes and decisions among sexual and gender minority youth and young adults at risk for HIV

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Abstract

Objective—In 2019, US advocates reported misleading language regarding the safety of TDF/FTC (Truvada®) used by lawsuit advertisements against Gilead Sciences. We sought to ascertain the reach and effects of the advertisements on PrEP opinions and decisions in a cohort of youth and young adults at-risk for HIV.

Design—An online survey was administered to participants enrolled in Keeping it LITE, a prospective US cohort study of ethnically diverse, sexually active, cis- and transgender persons ages 13–37.

Methods—Quantitative data were analyzed using descriptive and inferential analysis in SAS, and qualitative data via thematic analysis.

Results—Survey response rate was 51.3% (n=1485). Mean age at baseline was 24. Previous PrEP use was reported by 43% of respondents and 32.7% reported PrEP use in the past 6 months. Almost half (48.7%) were aware of the lawsuit. Most of these participants (81.3%) reported the advertisements did not impact their PrEP use, but 13.2% decided to not to begin a Truvada-based PrEP regimen and 5.5% decided to stop taking Truvada due to the advertisements claims. Predictors of changing PrEP behavior were lower education and no previous PrEP use. The qualitative analysis revealed the advertisements increased skepticism about safety and benefit of Truvada PrEP and led to greater distrust of the pharmaceutical industry.

Conclusions—The advertisements reached a large, diverse US audience. Disturbingly, 18.7% of PrEP candidates who were aware of the lawsuit attributed not initiating or cessation of a Truvada-based PrEP regimen to exposure to the Truvada lawsuit advertisements.

Keywords

adolescents and young adults; HIV Prevention; Online advertising; Pre-exposure Prophylaxis

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Data were presented in part at the AIDS 2020 Conference in San Francisco, California.

INTRODUCTION

Tenofovir-disoproxil-fumarate in combination with emtricitabine (TDF/FTC or Truvada®) was the first HIV pre-exposure prophylaxis (PrEP) drug approved for adults in 2012, and adolescents in 2018. Truvada-based PrEP received a grade-A recommendation by the United States (US) Preventive Services Task Force in 2019[1]. Across multiple studies, Truvada has been found safe and highly efficacious for HIV prevention[2]. Despite strong research data, clinical guidance and grass-roots campaigns, PrEP is not used by all in need. The CDC estimates that more than 1.2 million Americans would benefit from PrEP, yet less than 220,000 people have received PrEP to date[3]. Moreover, PrEP uptake across the US has been disparate across geographic regions, with the Northeast having the highest rate of PrEP use, and the South having the lowest PrEP-to-need ratio, which is the ratio of PrEP users to the number of people newly diagnosed with HIV[4]. Cost, stigma and medical mistrust prevent many at-risk minorities from obtaining and benefiting from PrEP[5]. PrEP uptake in persons at high risk of HIV acquisition is a critical component of the US Ending the HIV Epidemic (EHE) strategy and it is unlikely that the US will bend the epidemic curve of HIV without widespread use of PrEP[6].

As early as August 2018, personal injury class action lawsuits were filed in California against Gilead Sciences (Gilead), the makers of Truvada. Soon after, advertisements to identify plaintiffs for these lawsuits were launched in the press and on social media. These advertisements, targeting gay men in general and PrEP users in particular, highlighted and exaggerated Truvada's impact on kidney functioning and bone mineral density as well as other medication side effects. Starting in April 2019[7], journalists began publishing concerns on behalf of public health advocates that these advertisements were misleading, and PrEP providers began reporting cases of patients abandoning their PrEP and HIV therapy regimens due to concerns raised by the advertisements[8]. In December 2019, a joint letter to Facebook co-signed by over 60 US public health institutions, requested an update to their advertisement policies to screen for factually inaccurate information in advertisements for health services, products and related topics[9]. Facebook removed some but not all advertisements, and to date many advertisements continue to run[10]. Thus far the scope of reach and impact the advertisements may have had on PrEP attitudes and usage has remained unclear.

The current study aimed to ascertain the potential impact of the advertisements on the attitudes and decisions about PrEP among participants in an existing virtual cohort study of sexual and gender minority youth and young adults across the US, called Keeping It LITE (LITE)[11].

METHODS

The overall aim of the LITE study, is to identify factors that predict HIV acquisition among high risk sexual and gender minorities using a virtual prospective cohort design. The study uses limited interaction targeted epidemiology methodologies, including digital advertising for recruitment, social media messaging, text messaging, and email for retention, at-home rapid HIV oral testing, online data collection, and electronic incentive delivery. Participants

were recruited via social media and geospatial networking applications from 12/2017 to 12/2019. Eligible participants include HIV negative as well as newly diagnosed HIV positive cisgender men or transgender/gender non-binary (TGNB) individuals between the ages of 13–34 at enrollment who are sexually active with persons assigned male at birth (PAMAB). Sexual behavior inclusion criteria for those 18 and older includes one or more of the following in the last six months: sex with an HIV-infected partner, condomless anal sex, or a recent bacterial sexually transmitted infection (STI). Youth ages 13–17 are eligible if they have any of these risk factors or have had oral sex with an PAMAB. The investigators obtained a waiver of parental permission for the safety of sex and gender minority minors. The more permissive inclusion criteria for adolescents is intended to capture the evolution of sexual activity and perception of risk among very young participants. Cohort participants completed an online consent form, semi-annual behavioral surveys and remote HIV testing, and are compensated $50 per study event. Baseline measures include: demographic and socioeconomic status indicators; questionnaires on sexual identity, social support, intimate partner violence, sexual and substance use behaviors; mental health measures including depression, everyday discrimination, transgender discrimination, and post traumatic stress disorder; HIV, sexually transmitted infections and PrEP knowledge; and, access to HIV and STI prevention, PrEP, and gender affirming services.

For this substudy, all LITE participants enrolled by November 13, 2019, who were HIV uninfected were invited via email to participate in a survey to explore the scope and impact of the Truvada lawsuits on their PrEP uptake and persistence. All participants provided informed consent and were entered into a random drawing to win 1 of 5 electronic gift cards valued between $100 and $300. Survey responses were collected within a 1-month timeframe. Participants were first asked about lifetime and current PrEP use, if they were aware of the lawsuits and had read, seen or heard the advertisements. Those who had been exposed to the advertisements were asked if they had changed their PrEP use decisions and opinions due to the advertisements. This survey did not repeat any measures already captured in the baseline survey, thus respondents' survey data was merged with their baseline data for analyses. Finally, participants were provided with links to factual information about PrEP, including how to access HIV prevention services via the CDC's National Prevention Information Network search tools.

Covariates

Selected a priori, covariates of interest and potential confounders included age, race/ethnicity, education, sexual orientation, gender identity, income, number of risk criteria met for eligibility at screening, condom use during anal sex, geographic region, and PrEP use.

Statistical Analysis

Descriptive statistics (frequencies) were used to describe sociodemographic characteristics and compare them by knowledge of the Truvada lawsuit using Chi-square tests. Odds ratios and 95% confidence intervals were calculated and used to determine factors associated with knowledge of the Truvada lawsuit. Multivariable logistic regression models were fitted to obtain adjusted odds ratios and 95% confidence intervals. All variables associated with knowledge of the Truvada lawsuit in the unadjusted analyses ($p<0.05$) and variables of a

priori interest were included in the multivariable model and removed with stepwise selection. A p-value <0.05 was used to determine variables that remained in the final model. The final multivariable model adjusted for age, risk count, geographic region, and PrEP use. A similar analytic plan was followed among respondents who had knowledge of the lawsuit to compare the lawsuit's effect on decision to change behavior (quit taking or decided against taking PrEP). Among those that had knowledge of the lawsuit, descriptive statistics were used to describe characteristics of information dissemination and effect of the Truvada lawsuit, as well as sociodemographic variables. Bivariate analyses using Chi-square tests compared participant characteristics by change in behavior to no change. Unadjusted odds ratios and 95% confidence intervals were calculated to determine factors associated with change in behavior. All analyses were performed using SAS software, version 9.4 (SAS Institute, Inc, Cary, NC); a p-value <0.05 was considered statistically significant.

RESULTS

Participants

A total of 1485 (51.3%) of invited participants completed the survey within the 1-month timeframe (Table 1). Most participants were under 30 (61.8%). Participants identified as White (55%), 19.1% Latinx, 9.6% Black/African American, 5.3% Asian, and 11.1% other or mixed race. A majority of participants identified as cisgender men (82.1%), with the remainder identifying as transmasculine (transgender men and non-binary persons) (10.6%) or transfeminine (transgender women and non-binary persons) (7.3%). The majority of participants self-identified as gay/same gender loving (71.4%), followed by bisexual (12.6%), queer (10%), and other (6%). Compared to the Keeping it LITE participants who did not respond to the survey, those surveyed were more likely to be older, White, employed full-time.

Sexual Behavior and PrEP

At Keeping it LITE baseline, most participants (66.9%) endorsed at least 2 HIV transmission risk behaviors in the past 6 months, and few participants reported consistent condom use during anal sex (9.9%), with the majority reporting sporadic use (53.4%) or never using condoms (36.7%). Among respondents to the current survey, PrEP awareness was near ubiquitous (98.1%), about half reported having ever used PrEP (42.9%), and a third reported current PrEP use (32.7%).

Lawsuit Awareness and Exposure

Almost half (48.6%) of respondents were aware of the lawsuits or had seen lawsuit advertisements (Table 2). Subsequent questions were only asked to those exposed to the advertisements. Many participants who were aware were exposed to the advertisements through two or more media (70.8%), including advertisements on digital media, including social media (88.5%) and other mobile apps (32.1%), advertisements through traditional media, including radio/TV (31%), print (29.1%), and billboards (8.7%), as well as other channels, such as word of mouth (46%). Odds of having been aware of the lawsuit or having seen the advertisements increased with age, educational attainment and PrEP use (Table 1). Odds were higher for those identifying as gay or queer than for other groups, and were lower

for TGNB individuals. Some differences were observed across US regions, with generally lower awareness in the Midwest and Northeast than in the West and South though these differences did not reach statistical significance. There was no significant difference in awareness by race/ethnicity, or income.

Participants were asked “Did the advertisements change your decision to start Truvada or stop taking Truvada?” and answered the following: decided to continue (39.8%), decided not to start (13.2%), decided to to stop (5.5%), or had not considered PrEP even prior to ads (41.5%) (Table 2). When we examined predictors of change in PrEP behavior, greater educational attainment (OR = 0.40, 99% CI 0.23–0.72) and previous PrEP use experience (OR = 0.54, 99% CI 0.37–0.80) were found to be protective factors against deciding to quit or not start PrEP (Table 3).

Open-Ended Themes

Participants were asked an open-ended question: “Did hearing about the lawsuit change your opinion about Truvada-based PrEP?” We explored the responses from those who responded affirmatively (32.1%) through a qualitative analysis. Responses to this question were reviewed by four team members, including an initial exploration of themes and final review where themes were agreed upon. Four primary themes emerged: 1) Concern about risks / benefits of using Truvada, 2) concern about possible side effects, 3) interest in other biomedical (Descovy, etc.) and/or other behavioral prevention interventions, and 4) distrust of the pharmaceutical industry.. Although we specifically asked participants how the advertisements affected their opinions of Truvada as PrEP, participants generally used the term “PrEP” in their responses, and less often specifically “Truvada” or “Descovy.” The conflating of Truvada-based PrEP and PrEP in the respondents’ answers suggests that the advertisements may undermine trust in PrEP in general, not just Truvada-based PrEP, though we cannot say for certain that is the case with our data.

Concern about risks / benefits of using Truvada.

This category encompassed participants who appeared to weigh the risks and benefits of PrEP in light of the lawsuit advertisements, but ultimately decided it was better to continue PrEP. One participant wrote “I feel that the medication is harmful to me, but it prevents HIV; for me I’m at higher risk of getting HIV than I am of getting other health problems, so even with hesitation I’m forced to take it because I don’t have another less harmful option.” Another participant responded that the lawsuit advertisement “did give me pause about whether I should continue to take it or not. I decided that the benefits of preventing HIV was worth the potential side effects.”

Responses in this category also included participants who reported that exposure to the lawsuit advertisements caused them to stop taking PrEP entirely. One participant stated that “my family started to express concern for my liver function, so I discontinued due to a relationship change but largely from the lawsuit ads.” Another participant stated that “I thought it [Truvada] was the best thing to help in the prevention of HIV, but now knowing the major side effects I decided to stop.” Other participants asserted that while the lawsuits made them stop taking Truvada, they switched to other PrEP alternatives, such as Descovy.

One such participant reported “I only want Descovy now and I want to see if my bone density was affected.”

Responses in this category, also included participants who had been considering going on Truvada-based PrEP, but then changed their mind or are now hesitant due to the lawsuit advertisements. Participants reported that they were “now unsure about taking PrEP” or “don’t want to take it now – too scared.” One participant described that Truvada may be acceptable for treatment but not prevention: “I decided PrEP wasn’t safe to take, but if I become HIV+ it might still be an option. As a preventative option, I have decided against it until I’m more certain of its safety.” Another participant wrote “I heard about the side effects and issues before the lawsuits, but the lawsuits cemented that I’m not ever going to use Truvada!”

Concern about possible side effects.

Responses in this category focused on participants increased concern regarding side effects due to the language in the lawsuit advertisements. One participant reported that the lawsuits “made me more aware of the potential danger I could incur.” In addition to concerns about side effects in general, sub-themes included participants who were particularly concerned about bone or renal toxicity. For example, one participant stated that “because these medicines are so high power, I don’t want to risk having kidney failure or bone loss from taking the medication.”

Respondents discussed interest for other biomedical (Descovy, etc.) and/or behavioral prevention interventions.

Responses in this category focused on how the lawsuit advertisements made participants reconsider other options for HIV prevention that were not medication-based, including condoms, monogamy and abstinence. A participant stated “I would rather abstain from sexual activity than take medication that may lead to future long-term health complications” another participant reported “I was about to start taking PrEP, but since I heard it could affect my bones/kidneys, I thought it wasn’t worth it. I’ll just use condoms which can’t impact my bones/kidneys.”

Respondents discussed distrust of the pharmaceutical industry.

This final theme contained responses by participants regarding their overall distrust of the pharmaceutical industry in general, and Gilead Sciences in particular. Distrust included the motivations of drug companies in the HIV field as well as lack of transparency toward consumers. One participant stated that “prescription drug companies only want to make money off HIV and not really eliminate the disease,” while another said that pharmaceutical companies “know about harmful side effects and still sell, making people’s lives harder than they already are.” In regard to Gilead Sciences, many participants had strong statements. One participant wrote “I now have a negative feeling toward Gilead knowing not only that the medication should cost significantly less that it does, but that they’ve had a safer drug available yet haven’t replaced Truvada.” Another participant stated “I feel like the makers of Truvada are greedy and don’t actually care about people so I don’t really want to give them my money.”

DISCUSSION

We have demonstrated that the reach of the Truvada lawsuit advertisements was nationwide and pervasive, with no differences by race/ethnicity or income. However, we did observe differences in awareness across age, gender identity, sexual orientation, educational attainment, and PrEP use history. Participants who were older, gay or same gender loving men, or had ever used PrEP, were more likely to have been exposed to the advertisements, which may provide an indication of who was targeted in the advertising criteria and the fact that TGNB individuals are harder to target through specific apps and social media platforms. Finally, although most participants reported having heard or seen the advertisements through more than one medium, social media and word of mouth were the most frequent dissemination channels. The power of social media messaging, as well as word of mouth among peers has been found to facilitate PrEP awareness and uptake [12, 13]. During the COVID-19 pandemic, Zarocostas[14] reported on social media's ability to rapidly disseminate disinformation, adding additional challenges to the public health response.

The impact of the advertisements on PrEP use resulted in a fifth of participants either stopping their Truvada-based PrEP use, or not starting PrEP altogether. Given the HIV risk profile of our study sample, including low condom use, the detrimental impact on PrEP uptake and persistence is alarming. In 2019, the CDC estimated that 1 in 6 men who have sex with men (MSM), including 1 in 2 African American MSM, and 1 in 4 for Latino MSM would be diagnosed with HIV in their lifetime, if current acquisition rates persist[15]. In a San Francisco cohort of 986 PrEP users, Spinelli et al.[16] reported a 7.5-fold higher HIV incidence rate in patients who stopped PrEP compared to those who persisted. Elion et al.[17] found that while universal PrEP by MSM would be the most effective at reducing total HIV incidence in MSM, targeted PrEP in young Black and Latinx MSM would be most efficient. A more recent equity-based model projected a significant reduction in the racial disparity in HIV incidence, only when PrEP was equitably utilized[18].

Our qualitative data provide depth and context to the quantitative results. Among participants who reported the advertisements changed their opinion about PrEP, a variety of themes emerged, with some questioning the safety of Truvada and PrEP in general, and others describing their interest in alternative prevention options and general disdain of the pharmaceutical industry. Among participants who persisted on PrEP as opposed to stopping, a common reason was weighing the risk of HIV infection as higher than the risk of experiencing potential side effects. Participants often reported concerns about side effects that are known to be related with Truvada-based PrEP use, as well as those not known to be related to Truvada use or very rare, such as liver toxicity. This presents an opportunity for PrEP providers to help patients understand their risk, as well as clarify known side effects of Truvada as PrEP. Assessing one's own personal risk for HIV can be difficult, as Freeborn et al.[19] reports even current PrEP users have trouble accurately assessing their risk for HIV.

Some participants reported that viewing the Truvada lawsuit advertisements led to or exacerbated distrust of the pharmaceutical industry and/or specifically Gilead and a belief that the healthcare system/pharmaceutical companies were more interested in profit than people. Several other studies have also documented persistent medical mistrust, including

belief in HIV/AIDs conspiracies, among vulnerable communities of color and gender and sex minorities[20, 21, 22]. The US EHE plan, which includes increasing PrEP uptake and persistence as a key preventive strategy[23], and its national PrEP assistance program in partnership with Gilead[24] will need to dispel this disinformation to prove effective. Andrasik et al.[25] describes the critical need to address the historic discrimination, stigma and biases that threaten the ability to end the HIV epidemic, including addressing distrust in our healthcare systems.

Even as the EHE plan is funding the strategic rollout of PrEP programs in the 50 key jurisdictions, and activates its Ready Set PrEP program, Gilead's Truvada patent license is set to expire, which will allow cheaper generics to enter the market alongside Gilead's new Descovy. Although the USPSTF guidance is currently limited to Truvada, the stage is set for a prescribing dilemma as clinicians, insurers and pharmaceutical companies weigh which approved PrEP drug is right for each patient[26]. This may be further complicated as Costantini & Walensky [27] report a need to limit costs to the healthcare system, while expanding access to services.

Strengths of the study include the large and diverse national sample including HIV-vulnerable youth, as well as the mixed-methods approach which added depth to our understanding of the phenomena. Limitations include an abbreviated questionnaire which was designed to maximize response rate, which required that we use baseline demographic and sexual risk data, though we are confident that participants' HIV-vulnerability did not change. Furthermore, we may have not provided sufficient survey reminders, or sufficient incentives, given the relatively low response rate. Although it may appear there was some self-selection bias by participants, it may also speak to who was targeted by the advertisements, and felt they could respond to the survey.

CONCLUSION

In conclusion, the findings of this survey highlight the impact of misleading advertising on PrEP-related opinions and usage among vulnerable Americans. The EHE plan depends upon PrEP uptake and persistence among these groups. This requires a whole-of-society effort to combat these dangerous misperceptions by increasing pressure on social media organizations, disseminating fact-based information about PrEP-related risks and benefits, and engaging communities in respectful shared decision-making around HIV prevention.

Acknowledgments

Mr. Serrano and Ms. Daubert drafted and revised the manuscript, including leading the primary quantitative and qualitative analyses; Mr. Muñoz conducted data collection and qualitative thematic analysis coding; Dr. French and Dr. Hosek approved the study design concept, findings, and original and revised manuscripts.

We would like to acknowledge our funders, the National Institutes of Allergy and Infectious Disease (UH3-AI133676-03), National Institute of Mental Health, the Eunice Kennedy Shriver National Institutes of Child Health and Human Development, our institutions at Cook County Health and the Hektoen Institute of Medicine, and the study participants of the Keeping it LITE study. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

Conflicts of Interest and Source of Funding:

None of the authors have a conflict of interest. The Keeping it LITE Study is funded by the National Institute of Allergy and Infectious Diseases, the National Institute of Mental Health, and by the Eunice Kennedy Shriver National Institute of Child Health and Human Development (UH3-AI133676-03).

References

1. Owens DK, Davidson KW, Krist AH, et al. Preexposure Prophylaxis for the Prevention of HIV Infection: US Preventive Services Task Force Recommendation Statement. JAMA 2020; 321:2203–2213. doi:10.1001/jama.2019.6390
2. Chou R, Evans C, Hoverman A, et al. Preexposure Prophylaxis for the Prevention of HIV Infection: Evidence Report and Systematic Review for the US Preventive Services Task Force. JAMA 2019; 321:2214–2230. doi:10.1001/jama.2019.2591 [PubMed: 31184746]
3. Harris NS, Johnson AS, Huang YA, et al. Vital Signs: Status of Human Immunodeficiency Virus Testing, Viral Suppression, and HIV Preexposure Prophylaxis — United States, 2013–2018. MMWR Morb Mortal Wkly Rep 2019; 68:1117–1123. DOI: 10.15585/mmwr.mm6848e1 [PubMed: 31805031]
4. Siegler AJ, Mehta CC, Mouhanna F, et al. Policy- and county-level associations with HIV pre-exposure prophylaxis use, the United States, 2018. Ann Epidemiol 2020; 45:24–31.e3. doi:10.1016/j.annepidem.2020.03.013 [PubMed: 32336655]
5. Mayer KH, Agwu A, Malebranche D. Barriers to the Wider Use of Pre-exposure Prophylaxis in the United States: A Narrative Review. Adv Ther 2020; 37:1778–1811. doi:10.1007/s12325-020-01295-0 [PubMed: 32232664]
6. Fauci AS, Redfield RR, Sigounas G, Weahkee MD, Giroir BP. Ending the HIV Epidemic: A Plan for the United States. JAMA 2019; 321:844–845. doi:10.1001/jama.2019.1343 [PubMed: 30730529]
7. Holman CM. Gilead Sciences Sued for Failing to Bring a Follow-On Version of Truvada to Market Sooner. Biotechnology Law Report 2019; 38:267–275. doi:10.1089/blr.2019.29145.cmh
8. Nunn AS, Goedel WC, Gomillia CE, et al. False information on PrEP in direct-to-consumer advertising. Lancet HIV 2020; 7:e455–e456. doi:10.1016/S2352-3018(20)30034-5 [PubMed: 32032537]
9. Open Letter to Facebook. GLAAD https://www.glaad.org/blog/open-letter-facebook. Published December 17, 2019 Accessed September 4, 2020.
10. Mathias T Misleading ads turn people away from HIV-prevention meds. Reuters https://www.reuters.com/article/us-health-hiv-prep/misleading-ads-turn-people-away-from-hiv-prevention-meds-idUSKBN20P388. Published March 2, 2020 Accessed September 4, 2020.
11. French AL, Hosek SG. Keeping it LITE: Exploring HIV Risk in Vulnerable Youth with Limited Interaction. Grantome https://grantome.com/grant/NIH/UH3-AI133676-04. Published August 1, 2020 Accessed September 4, 2020.
12. Lelutiu-Weinberger C, Wilton L, Koblin BA, et al. The Role of Social Support in HIV Testing and PrEP Awareness among Young Black Men and Transgender Women Who Have Sex with Men or Transgender Women. J Urban Health 2020; doi:10.1007/s11524-019-00396-8
13. Quinn KG, Christenson E, Spector A, Amirkhanian Y, Kelly JA. The Influence of Peers on PrEP Perceptions and Use Among Young Black Gay, Bisexual, and Other Men Who Have Sex with Men: A Qualitative Examination. Arch Sex Behav 2020; 49:2129–2143. doi:10.1007/s10508-019-01593-x [PubMed: 32016815]
14. Zarocostas J How to fight an infodemic. Lancet 2020; 395:676. doi:10.1016/S0140-6736(20)30461-X [PubMed: 32113495]
15. Centers for Disease Control and Prevention. Estimated HIV incidence and prevalence in the United States, 2010–2016. HIV Surveillance Supplemental Report 2019; 24(No. 1). http://www.cdc.gov/hiv/library/reports/hiv-surveillance.html. Published February 2019 Accessed September 4, 2020.
16. Spinelli MA, Laborde N, Kinley P, et al. Missed opportunities to prevent HIV infections among pre-exposure prophylaxis users: a population-based mixed methods study, San Francisco, United States. J Int AIDS Soc 2020; 23:e25472. doi:10.1002/jia2.25472 [PubMed: 32294338]

17. Elion RA, Kabiri M, Mayer KH, et al. Estimated Impact of Targeted Pre-Exposure Prophylaxis: Strategies for Men Who Have Sex with Men in the United States. Int J Environ Res Public Health 2019; 16. doi:10.3390/ijerph16091592

18. Goedel WC, Bessey S, Lurie MN, et al. Projecting the impact of equity-based preexposure prophylaxis implementation on racial disparities in HIV incidence among MSM. AIDS. 8 2020;34(10):1509–1517. doi:10.1097/QAD.0000000000002577 [PubMed: 32384282]

19. Freeborn K, Portillo C, Boyer CB, Santos GM. Misclassification of sexual health risks in a self-identified low risk cohort of men who have sex with men (MSM) enrolled in a community based PrEP program. AIDS Care 2020; 32:230–237. doi:10.1080/09540121.2019.1620167 [PubMed: 31129982]

20. Arrington-Sanders R, Hailey-Fair K, Wirtz AL, et al. Role of Structural Marginalization, HIV Stigma, and Mistrust on HIV Prevention and Treatment Among Young Black Latinx Men Who Have Sex with Men and Transgender Women: Perspectives from Youth Service Providers. AIDS Patient Care STDS 2020; 34:7–15. doi:10.1089/apc.2019.0165 [PubMed: 31944853]

21. Ojikutu BO, Amutah-Onukagha N, Mahoney TF, et al. HIV-Related Mistrust (or HIV Conspiracy Theories) and Willingness to Use PrEP Among Black Women in the United States. AIDS Behav 2020; 24:2927–2934. doi:10.1007/s10461-020-02843-z [PubMed: 32239358]

22. Olansky E, Mansergh G, Pitts N, et al. PrEP Awareness in the Context of HIV/AIDS Conspiracy Beliefs Among Black/African American and Hispanic/Latino MSM in Three Urban US Cities. J Homosex 2020; 67:833–843. doi:10.1080/00918369.2018.1557953 [PubMed: 30633661]

23. Kapadia F, Landers S. Ending the HIV Epidemic: Getting to Zero AND Staying at Zero. Am J Public Health 2020; 110:15–16. doi:10.2105/AJPH.2019.305462 [PubMed: 31800280]

24. Rubin R HHS Provides Free PrEP Medication to People Without Drug Coverage. JAMA 2020; 323:300. doi:10.1001/jama.2019.21077

25. Andrasik M, Broder G, Oseso L, Wallace S, Rentas F, Corey L. Stigma, Implicit Bias, and Long-Lasting Prevention Interventions to End the Domestic HIV/AIDS Epidemic. Am J Public Health 2020; 110:67–68. doi:10.2105/AJPH.2019.305454 [PubMed: 31800273]

26. Krakower DS, Daskalakis DC, Feinberg J, Marcus JL. Tenofovir Alafenamide for HIV Preexposure Prophylaxis: What Can We DISCOVER About Its True Value? Ann Intern Med 2020; 172:281–282. doi:10.7326/M19-3337 [PubMed: 31931525]

27. Costantini S, Walensky RP. The Costs of Drugs in Infectious Diseases: Branded, Generics, and Why We Should Care. J Infect Dis 2020; 221:690–696. doi:10.1093/infdis/jiz066 [PubMed: 30887033]

Table 1.

Characteristics of Keeping it LITE participants who responded to Truvada lawsuit survey by knowledge of Truvada lawsuit. (n=1,485)

	Responded (n=1,485) N (%)	Heard about lawsuit (n=722) N (%)	Had not heard about lawsuit (n=763) N (%)	Univariate OR (95% CI)	p value	Multivariable OR (95% CI)[a]
Age						
<25	480 (32.3)	173 (24.0)	307 (40.2)	Ref.	**<.0001**	Ref.
25–29	542 (36.5)	273 (37.8)	269 (35.3)	**1.80 (1.40–2.32)**		**1.40 (1.02–1.93)**
30–34	382 (25.7)	218 (30.2)	164 (21.5)	**2.36 (1.79–3.11)**		**1.84 (1.30–2.59)**
35+	81 (5.5)	58 (8.0)	23 (3.0)	**4.47 (2.67–7.50)**		**4.05 (2.13–7.72)**
Race/Ethnicity						
Asian	78 (5.3)	30 (4.1)	48 (6.3)	0.59 (0.34–1.02)	.318	
Black/African American	143 (9.6)	75 (10.4)	68 (8.9)	1.04 (0.66–1.63)		
Latinx	283 (19.1)	135 (18.7)	148 (19.4)	0.86 (0.58–1.26)		
White	816 (54.9)	397 (55.0)	419 (54.9)	0.89 (0.64–1.25)		
Other	165 (11.1)	85 (11.8)	80 (10.5)	Ref.		
Education						
≤HS/GED or Vocational/Trade	505 (39.5)	234 (36.2)	217 (42.7)	Ref.	**.015**	
Associate's or Bachelor's Degree	504 (39.3)	257 (39.8)	247 (39.0)	1.21 (0.94–1.54)		
Post-Graduate Degree	271 (21.2)	155 (24.0)	116 (18.3)	**1.55 (1.15–2.08)**		
Sexual orientation						
Bisexual	187 (12.6)	71 (9.8)	116 (15.2)	Ref.	**.004**	
Gay/SGL	1,060 (71.4)	535 (74.1)	525 (68.8)	**1.66 (1.21–2.29)**		
Queer	148 (10.0)	79 (11.0)	69 (9.0)	**1.87 (1.21–2.90)**		
Other	90 (6.0)	37 (5.1)	53 (7.0)	1.14 (0.68–1.91)		
Gender identity						
AMAB – Cisgender	1,219 (82.1)	618 (85.6)	601 (78.8)	Ref.	**.0003**	
AMAB – TGNC	109 (7.3)	51 (7.1)	58 (7.6)	0.86 (0.58–1.27)		
AFAB – TGNC	157 (10.6)	53 (7.3)	104 (13.6)	**0.50 (0.35–0.70)**		
Family income						
<$20,000	305 (31.3)	134 (27.2)	171 (35.5)	Ref.	.092	
$20,000 – <$50,000	321 (33.0)	173 (35.1)	148 (30.8)	**1.49 (1.09–2.04)**		
$50,000 – <$90,000	222 (22.8)	119 (24.1)	103 (21.4)	**1.47 (1.04–2.09)**		
$90,000 – <$150,000	80 (8.2)	42 (8.5)	38 (7.9)	1.41 (0.86–2.31)		
≥$150,000	46 (4.7)	25 (5.1)	21 (4.4)	1.52 (0.82–2.83)		
Risk Count[b]						
1	134 (9.0)	33 (4.6)	101 (13.2)	**0.20 (0.11–0.37)**	**<.0001**	0.41 (0.16–1.04)
2	993 (66.9)	471 (65.2)	522 (68.4)	**0.56 (0.34–0.90)**		0.64 (0.36–1.15)
3	282 (19.0)	171 (23.7)	111 (14.6)	0.95 (0.56–1.60)		0.93 (0.50–1.72)
4	76 (5.1)	47 (6.5)	29 (3.8)	Ref.		Ref.

	Responded (n=1,485) N (%)	Heard about lawsuit (n=722) N (%)	Had not heard about lawsuit (n=763) N (%)	Univariate OR (95% CI)	p value	Multivariable OR (95% CI)[a]
Condom use during anal sex						
Always	119 (9.9)	54 (8.9)	65 (10.8)	Ref.	.506	
Sometimes[c]	643 (53.4)	329 (54.5)	314 (52.3)	1.26 (0.85–1.87)		
Never	443 (36.7)	221 (36.6)	222 (36.9)	1.20 (0.80–1.80)		
Geographic region[d]						
Northeast	199 (13.4)	93 (12.9)	106 (13.9)	0.88 (0.59–1.30)	.088	0.95 (0.59–1.53)
South	349 (23.5)	189 (26.2)	61 (8.0)	1.18 (0.84–1.67)		1.43 (0.94–2.17)
Midwest	735 (49.5)	339 (46.9)	396 (51.9)	0.86 (0.63–1.17)		0.81 (0.55–1.18)
West	202 (13.6)	101 (14.0)	101 (13.2)	Ref.		Ref.
PrEP Use						
Recent use	486 (32.7)	303 (42.0)	183 (24.0)	**2.41 (1.92–3.04)**	**<.0001**	**1.77 (1.32–2.38)**
Former use	152 (10.2)	77 (10.7)	75 (9.8)	**1.50 (1.06–2.12)**		1.25 (0.82–1.89)
Never used	818 (55.1)	333 (46.1)	485 (63.6)	Ref.		Ref.
Not aware of PrEP	29 (2.0)	9 (1.2)	20 (2.6)	0.66 (0.30–1.46)		0.53 (0.19–1.44)

Due to missing data, counts may not add up to total n=1485.

[a]Results from stepwise multivariable logistic regression. Variables included in the final model were age, risk count, geographic region, and PrEP use.

[b]Risk count summed sexual behaviors in the past 6 months endorsed at consent, including 1) having had oral sex with a partner assigned male at birth (AMAB) for ages 13–17 years old, and in addition for participants ages 18 or older, having 1) anal sex without condoms, 2) anal sex with a partner living with HIV, and/or 3) having had a recent bacterial STI diagnosis.

[c]Included sometimes, half of the time, and most of the time.

[d]Regions used in CDC's National HIV Surveillance System:

Northeast: CT, ME, MA, NH, NJ, NY, PA, RI, VT

Midwest: IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, WI

South: AL, AR, DE, DC, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV

West: AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY.

Table 2.

Among 722 Keeping it LITE participants who heard of the Truvada lawsuit, characteristics of information dissemination and effect of lawsuit.

	Heard about lawsuit N (%)
How did you hear about the lawsuit?	
Word of mouth	324 (46.0)
Billboards	61 (8.7)
Print Media	205 (29.1)
Radio/TV Media	218 (31.0)
Social Media	623 (88.5)
Mobile Media	226 (32.1)
Other	36 (5.1)
Heard about the lawsuit from more than one source?[a]	511 (70.8)
Did the advertisements change your decision to start Truvada-based PrEP or stop taking Truvada-based PrEP?	
No, Truvada was never an option	92 (13.1)
No, I never considered starting Truvada	200 (28.4)
No, I decided to continue taking Truvada	280 (39.8)
Yes, I decided against starting Truvada	93 (13.2)
Yes, I decided to quit taking Truvada	39 (5.5)
Did hearing about the lawsuit change your opinion about Truvada-based PrEP? (Yes).	226 (32.1)
Major Themes from Qualitative Analysis:	
1) Respondents discussed concern about risks / benefits of using Truvada	91 (40.26)
2) Respondents discussed concern about possible side effects	91 (40.27)
3) Respondents discussed interest for other biomedical (Descovy) and/or other behavioral prevention interventions	20 (8.85)
4) Respondents discussed distrust of pharmaceutical industry / viewing the industry as greedy	24 (10.62)

[a]This figure summed how many participants heard about the lawsuit from more than one source.

Table 3.

Characteristics of Keeping it LITE participants who heard about the Truvada Lawsuit by change in behavior. (n=704)

	Overall (n=704) N (%)	Changed (n=132) N (%)	Did not change (n=572) N (%)	Univariate OR (95% CI)	p value
Age					
<25	167 (23.7)	27 (20.5)	140 (24.5)	Ref.	.651
25–29	268 (38.1)	56 (42.4)	212 (37.0)	1.37 (0.83–2.27)	
30–34	211 (30.0)	39 (29.5)	172 (30.1)	1.18 (0.69–2.02)	
35+	58 (8.2)	10 (7.6)	48 (8.4)	1.08 (0.49–2.40)	
Race/Ethnicity					
Asian	28 (4.0)	4 (3.0)	24 (4.2)	0.57 (0.18–1.87)	.454
Black/African American	71 (10.1)	18 (13.65)	53 (9.3)	1.17 (0.55–2.47)	
Latinx	130 (18.5)	23 (17.4)	107 (18.7)	0.74 (0.37–1.48)	
White	395 (56.1)	69 (52.3)	326 (57.0)	0.73 (0.41–1.31)	
Other	80 (11.3)	18 (13.65)	62 (10.8)	Ref.	
Education					
≤HS/GED or Vocational/ Trade	228 (36.2)	57 (47.5)	171 (33.5)	Ref.	**.005**
Associate's or Bachelor's Degree	250 (39.7)	45 (37.5)	205 (40.2)	0.66 (0.42–1.02)	
Post-Graduate Degree	152 (24.1)	18 (15.0)	134 (26.3)	**0.40 (0.23–0.72)**	
Sexual orientation					
Bisexual	68 (9.6)	17 (12.9)	51 (8.9)	Ref.	.321
Gay/SGL	523 (74.3)	91 (68.9)	432 (75.5)	0.63 (0.35–1.14)	
Queer	78 (11.1)	15 (11.4)	63 (11.0)	0.71 (0.33–1.57)	
Other	35 (5.0)	9 (6.8)	26 (4.6)	1.04 (0.41–2.65)	
Gender identity					
AMAB – Cisgender	605 (85.9)	113 (85.6)	492 (86.0)	Ref.	.179
AMAB – TGNC	49 (7.0)	13 (9.9)	36 (6.3)	1.57 (0.81–3.06)	
AFAB – TGNC	50 (7.1)	6 (4.5)	44 (7.7)	0.59 (0.25–1.43)	
Family income					
<$20,000	130 (27.1)	29 (30.8)	101 (26.2)	Ref.	.790
$20,000 – <$50,000	169 (35.2)	33 (35.1)	136 (35.2)	0.85 (0.48–1.48)	
$50,000 – <$90,000	115 (24.0)	22 (23.4)	93 (24.1)	0.82 (0.44–1.53)	
$90,000 – <$150,000	41 (8.5)	7 (7.5)	34 (8.8)	0.72 (0.29–1.79)	
≥$150,000	25 (5.2)	3 (3.2)	22 (5.7)	0.47 (0.13–1.70)	
Risk Count[a]					
1	32 (4.6)	8 (6.1)	24 (4.2)	1.46 (0.48–4.42)	.120
2	463 (65.8)	95 (71.9)	368 (64.3)	1.13 (0.51–2.51)	
3	166 (23.6)	21 (15.9)	145 (25.4)	0.63 (0.26–1.55)	
4	43 (6.1)	8 (6.1)	35 (6.1)	Ref.	
Condom use during anal sex					

	Overall (n=704) N (%)	Changed (n=132) N (%)	Did not change (n=572) N (%)	Univariate OR (95% CI)	p value
Always	54 (9.1)	16 (14.2)	38 (7.9)	Ref.	.117
Sometimes[b]	325 (54.9)	59 (52.2)	266 (55.6)	0.53 (0.28–1.01)	
Never	213 (36.0)	38 (33.6)	175 (36.5)	0.52 (0.26–1.02)	
Geographic region[c]					
Northeast	91 (12.9)	11 (8.3)	80 (14.0)	0.71 (0.31–1.61)	.188
South	186 (26.4)	34 (25.8)	152 (26.6)	1.15 (0.60–2.20)	
Midwest	329 (46.8)	71 (53.8)	258 (45.1)	1.41 (0.78–2.56)	
West	98 (13.9)	16 (12.1)	82 (14.3)	Ref.	
PrEP Use					
Recent use	294 (41.8)	34 (25.8)	260 (45.4)	**0.43 (0.28–0.67)**	**.0002**
Former use	76 (10.8)	20 (15.1)	56 (9.8)	1.17 (0.66–2.07)	
Never used/Not aware of PrEP	334 (47.4)	78 (59.1)	256 (44.8)	Ref.	

Due to missing data, counts may not add up to total n=704.

[a]Risk count summed sexual behaviors in the past 6 months endorsed at consent, including 1) having had oral sex with a partner assigned male at birth (AMAB) for ages 13–17 years old, and in addition for participatns ages 18 or older, having 1) anal sex without condoms, 2) anal sex with a partner living with HIV, and/or 3) having had a recent bacterial STI diagnosis.

[b]Included sometimes, half of the time, and most of the time.

[c]Regions used in CDC's National HIV Surveillance System:

Northeast: CT, ME, MA, NH, NJ, NY, PA, RI, VT

Midwest: IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, WI

South: AL, AR, DE, DC, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV

West: AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY.