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## Same-Sex Marriage Laws, Provider-Patient Communication, and PrEP Awareness and Use Among Gay, Bisexual, and Other Men Who have Sex with Men in the United States

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### Abstract

State-level structural stigma and its consequences in healthcare settings shape access to pre-exposure prophylaxis (PrEP) for HIV prevention among gay, bisexual, and other men who have sex with men (GBMSM). Our objective was to assess the relationships between same-sex marriage laws, a measure of structural stigma at the state level, provider-patient communication about sex, and GBMSM awareness and use of PrEP. Using data from the Fenway Institute's MSM Internet Survey collected in 2013 (N = 3296), we conducted modified Poisson regression analyses to evaluate associations between same-sex marriage legality, measures of provider-patient communication, and PrEP awareness and use. Living in a state where same-sex marriage was legal was associated with PrEP awareness (aPR 1.27; 95% CI 1.14, 1.41), as were feeling comfortable discussing with primary care providers that they have had sex with a man (aPR 1.63; 95% CI

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**Code Availability** Code is available upon reasonable request of the authors.

**Declarations**

**Conflict of interest** The authors have no competing interests to declare that are relevant to the content of this article.

**Ethical Approval** This is an observational study. The Boston University Medical Campus Institutional Review Board has confirmed that no ethical approval is required.

**Consent to Participate** Not applicable.

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1.46, 1.82), discussing with their primary care provider having had condomless sex with a man (aPR 1.65; 95% CI 1.49, 1.82), and discussing with their primary care provider ways to prevent sexual transmission of HIV (aPR 1.39; 95% CI 1.26, 1.54). Each of these three measures of provider-patient communication were additionally associated with PrEP awareness and use. In sum, structural stigma was associated with reduced PrEP awareness and use. Policies that reduce stigma against GBMSM may help to promote PrEP and prevent HIV transmission.

## Keywords

Pre-exposure prophylaxis; Same-sex marriage laws; Structural stigma; Men who have sex with men

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## Introduction

An estimated 70% of incident human immunodeficiency virus (HIV) diagnoses in the United States (US) in 2019 were among gay, bisexual, and other men who have sex with men (GBMSM) [1]. Pre-exposure prophylaxis (PrEP) was first approved for use in 2012 and has been highly effective in preventing HIV acquisition for more than a decade [2–4], but as of 2017, only one in three GBMSM at risk for HIV infection reported ever initiating PrEP [5]. Large racial and ethnic inequities characterize both the burden of HIV and PrEP awareness [6] and use among GBMSM [1, 7]. Black and Hispanic/Latinx GBMSM are also less likely to report having discussed PrEP with a health care provider compared to their white GBMSM counterparts [7].

Structural stigma, or “societal-level conditions, cultural norms, and institutional policies and practices that constrain opportunities, resources, and wellbeing” [8], based on sexual orientation may contribute to lower PrEP uptake and adherence. Structural stigma of lesbian, gay, bisexual, transgender, queer, and other sexual minority (LGBTQ+) populations can derive from institutions, including states but also neighborhoods, schools, and healthcare settings. At each of these tiers, higher levels of stigma may be related to lower PrEP use among GBMSM through multiple mechanisms affecting providers and patients [9, 10]. Structural stigma—a determinant of health inequities among marginalized populations [8, 11, 12]—may make providers less comfortable inquiring about same-sex sexual behavior, preventing providers from identifying GBMSM patients who might benefit from PrEP [13–15]. In addition to shaping dialogue between providers and patients, structural stigma may further influence provider judgment about condomless sex between two males or numbers of sex partners [16, 17], attitudes which are associated with unwillingness to provide PrEP [16, 18]. In healthcare settings, 65% of LGBTQ+ medical providers reported hearing disparaging remarks about LGBTQ+ populations in the workplace [19] and 56% of LGBTQ+ patients reported experiencing discrimination in healthcare [20]. A median of just five hours of medical school curricula were dedicated to teaching LGBT-related content prior to the approval of PrEP by the Food and Drug Administration (FDA) [21].

Prior research indicates that HIV-related stigma by health professionals may contribute to the challenges of delivering PrEP to GBMSM, particularly among those who are Black and who face a substantially elevated risk of HIV [22]. Participants in a qualitative study in

Jackson, Mississippi and Boston, Massachusetts similarly reported concerns about culturally insensitive health care for gay men as a barrier to PrEP use [23]. However, there is little research on a national scale quantifying the extent to which structural LGBTQ+ stigma and its effects in healthcare settings—particularly on provider-patient communication—are related to low GBMSM PrEP awareness and use.

The legalization of same-sex marriage has previously been used as a measure of reduced systemic discrimination (i.e. structural stigma) and has been found to be positively associated with improved health outcomes [24, 25]. Further, a previous analysis included same-sex marriage laws in a composite measure of state-level structural stigma, along with density of same-sex couples, proportion of public high schools with Gay-Straight Alliances, public opinion polling, and other policies related to sexual orientation discrimination, to provide evidence of an association between structural sexual stigma and PrEP awareness and use [26]. The current analyses use the same dataset to build on this study by evaluating same-sex marriage legality as an independent measure of state-level structural stigma and describing how specific policies may have an impact on provider-patient communication and GBMSM health. We add to earlier findings by assessing the association between these measures of provider-patient communication and PrEP awareness and use. In sum, we extend existing work by evaluating same-sex marriage legality as a specific and salient measure of structural stigma that may perpetuate GBMSM stigma downstream in conversations in healthcare settings, and by addressing whether these stigmas may be associated with PrEP awareness and use.

Stigma can be measured and experienced in several ways, including enacted stigma (i.e. experiencing mistreatment), anticipated stigma (i.e. expectation of future mistreatment), and internalized stigma (i.e. personal endorsement of stereotypes and prejudice)—all of which are shaped by structural forces and may contribute to PrEP-related outcomes among GBMSM [27]. This study aimed to assess the relationships between the legalization of same-sex marriage as a measure of state-level LGBTQ+ stigma, GBMSM anticipated and internalized stigma via provider-patient communication in healthcare settings, and PrEP awareness and use among GBMSM. This is a historical analysis of data collected in 2013 that we conducted to inform how structural policies may affect prevention and spread of infectious diseases. The year of the data collection was ideal for evaluating same-sex marriage as a policy that may reduce structural stigma, as it had been implemented in 10 US jurisdictions (including the District of Columbia) but not in the 41 other states at that time.

## Methods

### Objectives

The primary objective of this study was to evaluate an association between measures of stigma and PrEP awareness and use among GBMSM in the US. We assessed structural stigma at the state level (as measured by same-sex marriage legality) and within healthcare settings, and described the relationship between each of these exposures and PrEP awareness and use. We also evaluated an association between same-sex marriage laws and provider-patient communication about sex and the extent to which these measures of provider-

patient communication mediate the relationship between same-sex marriage laws and PrEP awareness and use.

### Study Population

We used data from the MSM Internet Survey, a Fenway Institute survey of GBMSM recruited nationally through online social networking sites in 2013 [26]. While these data were collected some years ago, they are ideally suited for this study because just nine states and the District of Columbia had legalized same-sex marriage by the end of 2012, allowing for a comparison group of participants living in states where same-sex marriage was not legal. MSM Internet Survey eligibility criteria included being 18 years or older and having the ability to read and understand English ( $N=9046$ ). Further details about the survey participants and procedures are published in previous writing [26]. We restricted the sample to GBMSM who were assigned male at birth ( $N=8958$ ) and were HIV-negative ( $N=8386$ ). We then excluded participants with missing data for any of the exposures, outcomes, or covariates of interest ( $N=3959$ ). Of the remaining participants in the sample, we included only those who indicated that they had a primary care provider because provider-patient communication questions were only asked among this subset ( $N=3296$ ). The analytic sample included participants from all 50 US states and the District of Columbia.

### Exposures

The first exposure of interest was structural stigma at the state level, measured dichotomously by whether same-sex marriage was legal in the participants' state of residence as of January 1, 2013. The jurisdictions in which same-sex marriage was legal at the time of data collection and the years in which these laws were enacted are as follows: Connecticut, 2008; District of Columbia, 2010; Iowa, 2009; Maine, 2012; Maryland, 2013; Massachusetts, 2004; New Hampshire, 2010; New York, 2011; Vermont, 2009; Washington, 2012. Additional exposure variables measured consequences of anticipated and internalized stigma in healthcare settings by self-reported responses to three survey questions: (1) How comfortable do you feel discussing with your primary healthcare provider that you have had sex with a man? (2) Have you and your primary healthcare provider discussed if you have had condomless sex with a man? (3) Have you and your primary healthcare provider ever discussed ways to protect you from sexual transmission of HIV? Each of these three provider-patient communication exposures were coded as binary variables for those who had or had not had these discussions with their primary healthcare provider (PCP) and who felt comfortable or extremely comfortable having discussions with their PCP as compared to those who felt extremely uncomfortable, uncomfortable, or undecided.

### Outcomes

Our outcomes were PrEP awareness and use, both defined as binary variables. The PrEP awareness outcome was categorized based on yes or no responses to the survey question: Before today, had you heard about PrEP (i.e., pre-exposure prophylaxis)? PrEP use was measured based on whether participants reported having used PrEP in the past or were currently using PrEP.

## Covariates

We a priori decided to adjust the analyses for several demographic characteristics considered to be potential confounders. These variables included age group (18–24 years, 25–34 years, 35–44 years, 45–54 years, 55–64 years, and 65+ years), race and ethnicity (non-Hispanic white, non-Hispanic Black, non-Hispanic Native American, non-Hispanic Asian, non-Hispanic multiracial, and Hispanic or Latino), annual household income (less than \$30,000, \$30,000–\$59,999, \$60,000 or more), educational attainment (high school degree or less, some college, college graduate, and some graduate work or graduate/professional degree), and health insurance status, defined as a binary variable according to whether participants reported having any health insurance.

## Analysis

We first generated descriptive statistics of the demographic characteristics of the study sample as a whole and by exposure to each of the three measures of provider-patient communication. We then estimated crude and adjusted prevalence ratios (aPR) and 95% confidence intervals (CIs) to evaluate the relationship between same-sex marriage legality in participants' state of residence and PrEP awareness and use. We used Poisson regression models with robust error variance (i.e. modified Poisson regression) to approximate log-binomial regression models with  $\alpha = 0.05$  [28]. In the adjusted models, we included race/ethnicity, age group, educational attainment, household income, and health insurance status as covariates. Similarly, we also conducted crude and multivariable modified Poisson regression analyses to assess the association between each measure of provider-patient communication and PrEP awareness and use, again adjusted for each of the covariates of interest. Lastly, we conducted crude and multivariable modified Poisson regression analyses with same-sex marriage legality as the exposure and each measure of provider-patient communication as outcomes, adjusted for the same covariates in the multivariable model. As a supplementary analysis given the limitations of our cross-sectional data, we conducted structural equation modeling to estimate mediated associations between same-sex marriage laws and PrEP awareness and use via measures of provider-patient communication. All analyses were run in Stata 17.0 (StataCorp, College Station, TX).

## Results

Of the 3296 participants with primary healthcare providers who were included in the analytic sample, 965 (29.3%) lived in states where same-sex marriage was legal as of the start of 2013. There was no evidence of an association between living in a state where same-sex marriage was legal and having a primary healthcare provider (Supplementary Table 1). However, participants who reported having a primary healthcare provider and thus were included in the analytic sample were generally younger, had higher income and educational attainment, and were more likely to be white and to have health insurance compared to those without a primary healthcare provider (Supplementary Table 2). Of those included in the sample, 1813 (55.0%) participants reported that they felt comfortable discussing with their PCP that they have had sex with a man, 1207 (36.6%) participants reported that they had discussed with their PCP having had condomless sex with a man, and 1282 (38.9%) participants reported that they had discussed with their PCP ways to protect themselves from

sexual transmission of HIV (Table 1). The sample was predominantly made up of men aged between 25 and 64 years (89.6%). A majority of the sample identified as non-Hispanic white (85.9%), earned greater than \$30,000 annually (77.5%), and completed at least some college or higher education (94.2%) (Table 1). The demographic characteristics of participants who were classified as reporting “Yes” to each of the three provider-patient communication variables (i.e. did not experience consequences of anticipated and internalized stigma in healthcare settings) tended to skew in favor of middle age groups, non-white racial groups, higher annual income, and higher educational status (Supplementary Table 3). There was a greater percentage of participants who responded “Yes” to each of the three provider-patient communication variables among those who lived in states where same-sex marriage was legal, compared to those living in states where same-sex marriage was not legal (Fig. 1, Supplementary Table 1).

After adjusting for race/ethnicity, age group, educational attainment, household income, and health insurance status, living in a state where same-sex marriage was legal was associated with PrEP awareness (aPR 1.27; 95% CI 1.14, 1.41) (Table 2). The sample of participants who reported using PrEP was small ( $n = 43$ ), and so the similar model with PrEP use as an outcome resulted in an estimate with a wide confidence interval that includes the null value (aPR 1.61; 95% CI 0.89, 2.90) (Table 2).

There was a greater percentage of participants who reported PrEP awareness and use among those who reported more open provider-patient communication, as compared to those who responded “No” to each of these survey questions (Fig. 2). Each of the measures relating to provider-patient communication—feeling comfortable discussing with PCP having had sex with a man (aPR 1.63; 95% CI 1.46, 1.82), having discussed with PCP having had condomless sex with a man (aPR 1.65; 95% CI 1.49, 1.82), and having discussed with PCP ways to prevent sexual transmission of HIV (aPR 1.39; 95% CI 1.26, 1.54)—was associated with PrEP awareness, after adjusting for race/ethnicity, age group, educational attainment, household income, and health insurance status (Table 3). Although the small sample of participants who report using PrEP limits the interpretability of our results, we similarly found evidence of reduced PrEP use among GBMSM who report any measure of open provider-patient communication, after adjusting for the same covariates (comfort discussing sex aPR 6.08; 95% CI 2.41, 15.35; have discussed condomless sex aPR 4.62; 95% CI 2.34, 9.12; have discussed HIV prevention aPR 6.55; 95% CI 3.04, 14.11) (Table 4).

Living in a state where same-sex marriage was legal was also associated with participants reporting that they felt comfortable discussing with their PCP that they have had sex with a man (aPR 1.13; 95% CI 1.06, 1.21), that they had discussed with their PCP having had condomless sex with a man (aPR 1.29; 95% CI 1.18, 1.41), and that they had discussed with their PCP ways to protect themselves from sexual transmission of HIV (aPR 1.15; 95% CI 1.05, 1.26), after adjusting for race/ethnicity, age group, educational attainment, household income, and health insurance status (Table 2). Further, effect estimates generated by structural equation modeling to assess a mediated association between same-sex marriage laws and PrEP awareness via measures of provider-patient communication indicate that the proportion of the total effect that is mediated ranges from 0.07 (95% CI 0.04, 0.09) for having discussed ways to prevent sexual transmission of HIV to 0.19 (95% CI 0.12, 0.27)

for having discussed having had condomless sex with a man (Supplementary Table 4). These findings suggest that measures of provider-patient communication may partially mediate the relationship between same-sex marriage legality and PrEP awareness. In the models with PrEP use as an outcome, the total effects were statistically insignificant (Supplementary Table 4).

## Discussion

Same-sex marriage laws were associated with measures of provider-patient communication about sex and PrEP awareness among GBMSM. Policies shape the spread of infectious diseases like HIV and the use of infectious disease prevention tools like PrEP. Structural interventions that reduce stigma may help to promote PrEP awareness and use. Fundamental Cause Theory purports that structural stigma can present across various institutions—federal, state, local, and within healthcare settings—and may have implications for LGBTQ+health disparities [10]. State- and healthcare-level stigma may reduce healthcare provider education about MSM sexual health and PrEP, by making providers uncomfortable asking patients about their sexual orientation and behavior, and by influencing provider perspectives on GBMSM sexual behavior.

Our findings extend and are consistent with prior work on the relationship between sexual minority stigma and HIV control and prevention [26, 29, 30]. An earlier analysis using the same dataset developed a composite measure of state-level structural stigma and similarly found that lower levels of structural stigma were associated with increased odds of PrEP awareness and use, as well as increased odds of being comfortable discussing with a PCP having had sex with a man, having discussed with a PCP having had condomless sex with a man, and having discussed with a PCP ways to prevent sexual transmission of HIV [26]. An analysis of more recent data from the 2018 American Men’s Internet Survey also found evidence of stigma in healthcare settings as a barrier to healthcare access and HIV prevention for GBMSM [31]. Although there are very few datasets that collect information on perceived stigma in healthcare settings, our work is well-aligned with previous research that suggests that policies and other structural interventions promote PrEP use in the US [32].

This study is limited by self-reported data that could be affected by social desirability bias, and by the cross-sectional nature of these data that prevents us from evaluating temporal patterns. These cross-sectional data are particularly limiting for interpreting the supplementary mediation analyses, which were further limited by issues of model convergence when adjusting for covariates. Although there was representation across all 50 states and the District of Columbia, the survey was not constructed using probability sampling. Hence, generalizability of our findings is limited, especially since the sample represents a more white, affluent, and higher educated group than the overall population of GBMSM in the US. The sample size was too small to effectively evaluate the associations of interest in subgroups by race and ethnicity or by age group. Some states legalized same-sex marriage at the end of 2012, and it is possible that not enough time elapsed between these laws being enacted and data collection to detect any meaningful differences in the effects of changing structural stigma. Additionally, our sample included few participants who reported



using PrEP, which limited the interpretability of our models with PrEP use as an outcome. Despite the lag between data collection and analysis, these older data are ideal for evaluating the relationship between same-sex marriage laws as a reflection of reduced structural stigma and healthcare stigma and PrEP awareness and use at the time. At the same time, further investigation of newer data, such as the annual American Men's Internet Survey, may help inform how stigma and PrEP are associated in current clinical contexts.

Future research may also consider how quickly the mechanisms by which state and federal policies shape opinions, perceptions (i.e. anticipated and internalized stigma), and discrimination (i.e. enacted stigma) in health care settings and other contexts. It remains unmeasured whether federal legalization of same-sex marriage affected provider-patient communication or PrEP uptake, either in states that had previously legalized same-sex marriage or in those that had not. Similarly, living in a state that passed the Affordable Care Act (ACA) in 2010 may also contribute to PrEP awareness and use regardless of same-sex marriage legality. Although many states that did not legalize same-sex marriage prior to federal legalization also resisted the ACA and vice versa, some states were discordant. As the first states to expand Medicaid did so in 2014, years after passing the ACA, more recent data will be critical in evaluating the relationship between living in a Medicaid expansion state and PrEP awareness and use, and may provide further evidence of how policies shape PrEP awareness and use.

These historical data allow us to compare participants living in states where same-sex marriage is and is not legal, to assess how state-level stigma is associated with stigma in healthcare settings and with PrEP uptake. Although same-sex marriage is now legal in all US states, our findings provide evidence of how structural stigma may have contributed to barriers in PrEP access in the past. PrEP was FDA-approved in 2012, the year before these data were collected, and early PrEP rollout heavily targeted GBMSM. In the years since these data were collected, PrEP awareness and use has increased, but not uniformly. Many disparities have persisted, and racial inequities have been exacerbated [7]. Structural barriers, including structural racism and health care costs and access, continue to drive higher rates of HIV among Black and Latinx GBMSM and lower rates of PrEP use. In today's context, laws and policies related to LGBTQ + adoption, employment, and hate crimes may also contribute to stigma in healthcare settings and GBMSM access to PrEP. Further research is warranted to assess the relationship between other forms of structural stigma, such as policies that protect against sexual orientation discrimination, and PrEP awareness and use following federal legalization of same-sex marriage and to develop structural interventions that reduce stigma and promote HIV prevention among GBMSM in the US.

## Conclusion

State same-sex marriage laws were associated with increased PrEP awareness among GBMSM. Provider-patient communication about sex was associated with reduced PrEP awareness and use. State same-sex marriage laws were also associated with more open provider-patient communication. These findings suggest that high-level structural stigma may perpetuate stigma against GBMSM in more localized settings, including healthcare

facilities. Policies that reduce stigma at the state and healthcare levels may promote PrEP awareness and use and help to prevent HIV among communities at greatest risk.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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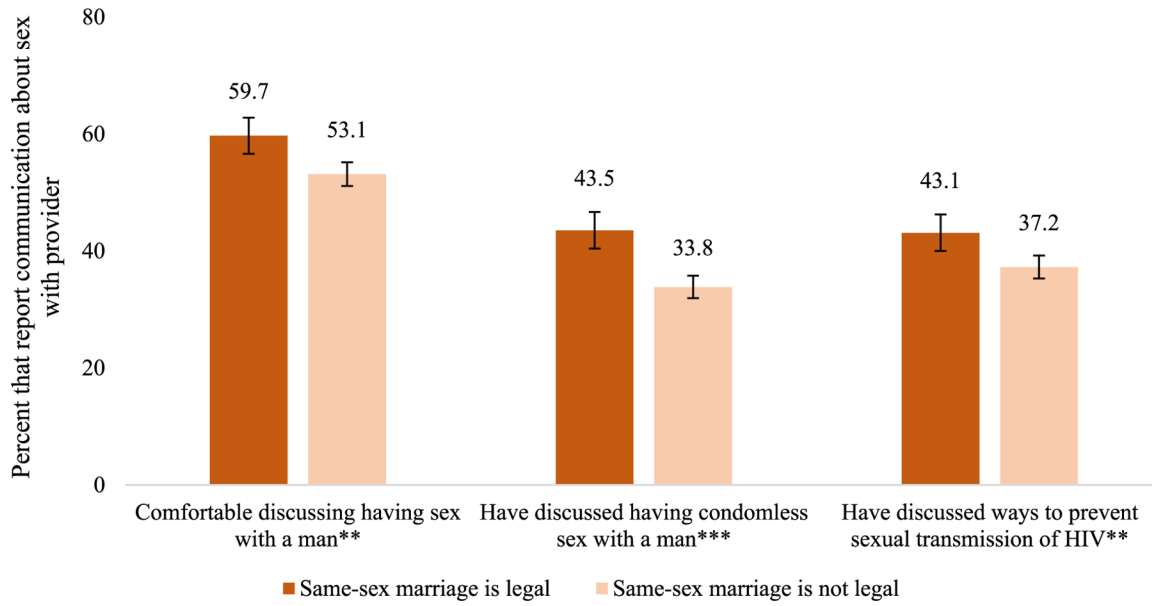
## Data Availability

Data were collected and made available by The Fenway Institute, Boston, MA, USA.

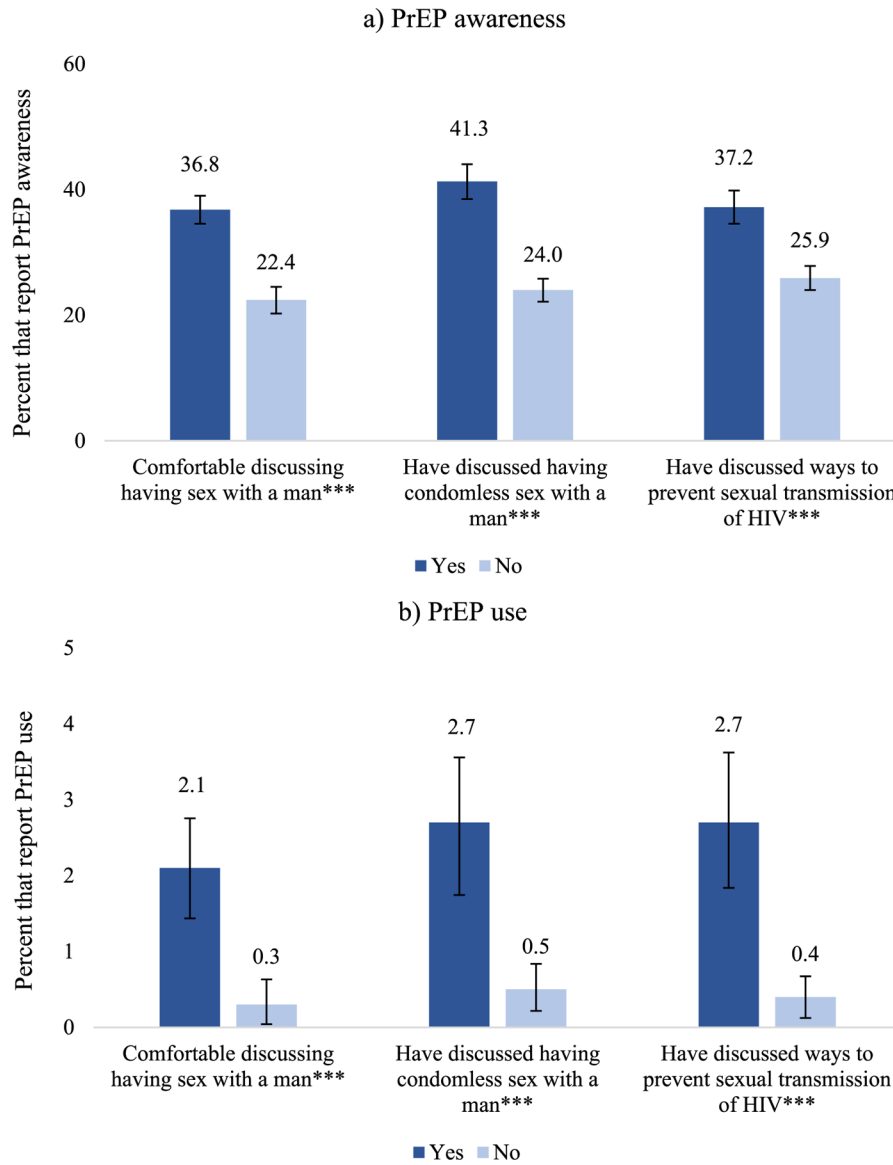
## References

- Centers for Disease Control and Prevention. Estimated HIV incidence and prevalence in the United States, 2015–2019. HIV surveillance supplemental report 2021; 26(No. 1). <http://www.cdc.gov/hiv/library/reports/hiv-surveillance.html>. Accessed 16 Feb 2022.
- Grant RM, Lama JR, Anderson PL, et al. Pre-exposure chemoprophylaxis for HIV prevention in men who have sex with men. *N Engl J Med* 2010;363:2587–99. [PubMed: 21091279]
- Molina J-M, Capitant C, Spire B, et al. On-demand pre-exposure prophylaxis in men at high risk for HIV-1 infection. *N Engl J Med* 2015;373:2237–46. [PubMed: 26624850]
- McCormack S, Dunn DT, Desai M, et al. Pre-exposure prophylaxis to prevent the acquisition of HIV-1 infection (PROUD): effectiveness results from the pilot phase of a pragmatic open-label randomised trial. *Lancet* 2016;387:53–60. [PubMed: 26364263]
- Finlayson T, Cha S, Xia M, et al. Changes in HIV pre-exposure prophylaxis awareness and use among men who have sex with men—20 urban areas, 2014 and 2017. *MMWR Morb Mortal Wkly Rep* 2019;68:597–603. [PubMed: 31298662]
- Raifman J, Nunn A, Oldenburg CE, et al. A quasi-experimental evaluation of a clinical pre-exposure prophylaxis education intervention. *Health Serv Res* 2018;53(4):2249–67. [PubMed: 28744983]
- Kanny D, Jeffries WLIV, Chapin-Bardales J, et al. Racial/ethnic disparities in HIV pre-exposure prophylaxis among men who have sex with men—23 urban areas, 2017. *MMWR Morb Mortal Wkly Rep* 2019;68:801–6.
- Hatzenbuehler ML, Phelan JC, Link BG. Stigma as a fundamental cause of population health inequalities. *Am J Public Health* 2013;103:813–21. [PubMed: 23488505]
- Makadon HJ, Mayer KH, Garofalo R. Optimizing primary care for men who have sex with men. *JAMA* 2006;296:2362–5. [PubMed: 17105799]
- Mayer KH, Bradford JB, Makadon HJ, et al. Sexual and gender minority health: what we know and what needs to be done. *Am J Public Health* 2008;98:989–95. [PubMed: 18445789]
- Hatzenbuehler ML. Structural stigma: research evidence and implications for psychological science. *Am Psychol* 2016;71(8):742–51. [PubMed: 27977256]
- Mitchell UA, Nishida A, Fletcher FE, Molina Y. The long arm of oppression: how structural stigma against marginalized communities perpetuates within-group health disparities. *Health Educ Behav* 2021;48(3):342–51. [PubMed: 34080480]
- Krakower D, Ware N, Mitty JA, et al. HIV providers' perceived barriers and facilitators to implementing pre-exposure prophylaxis in care settings: a qualitative study. *AIDS Behav* 2014;18:1712–21. [PubMed: 24965676]
- Mimiaga MJ, Goldhammer H, Belanoff C, et al. Men who have sex with men: perceptions about sexual risk, HIV and sexually transmitted disease testing, and provider communication. *Sex Transm Dis* 2007;34:113–9. [PubMed: 16810121]

15. Sanchez NF, Rabatin J, Sanchez JP, et al. Medical students' ability to care for lesbian, gay, bisexual, and transgendered patients. *Fam Med-Kans City* 2006;38:21.
16. Calabrese SK, Earnshaw VA, Underhill K, et al. The impact of patient race on clinical decisions related to prescribing HIV pre-exposure prophylaxis (PrEP): assumptions about sexual risk compensation and implications for access. *AIDS Behav* 2014;18:226–40. [PubMed: 24366572]
17. Grov C, Whitfield THF, Rendina HJ, et al. Willingness to take PrEP and potential for risk compensation among highly sexually active gay and bisexual men. *AIDS Behav* 2015;19:2234–44. [PubMed: 25735243]
18. Calabrese SK, Underhill K. How stigma surrounding the use of HIV pre-exposure prophylaxis undermines prevention and pleasure: a call to destigmatize 'Truvada whores.' *Am J Public Health* 2015;105:1960–4. [PubMed: 26270298]
19. Eliason MJ, Dibble SL, Robertson PA. Lesbian, gay, bisexual, and transgender (LGBT) physicians' experiences in the workplace. *J Homosex* 2011;58:1355–71. [PubMed: 22029561]
20. Legal Lambda. When health care isn't caring: Lambda Legal's survey of discrimination against LGBT people and people with HIV New York: Lambda Legal; 2010.
21. Obedin-Maliver J, Goldsmith ES, Stewart L, et al. Lesbian, gay, bisexual, and transgender-related content in undergraduate medical education. *JAMA* 2011;306(9):972–7.
22. Ezennia O, Geter A, Smith DK. The PrEP care continuum and Black men who have sex with men: a scoping review of published data on awareness, uptake, adherence, and retention in PrEP care. *AIDS Behav* 2019;23:2654–73. [PubMed: 31463711]
23. Cahill S, Wade Taylor S, Elsesser SA, et al. Stigma, medical mistrust, and perceived racism may affect PrEP awareness and uptake in black compared to white gay and bisexual men in Jackson, Mississippi and Boston, Massachusetts. *AIDS Care* 2017;29(11):1351–8. [PubMed: 28286983]
24. Raifman J, Moscoe E, Austin SB, McConnell M. Difference-indifferences analysis of the association between state same-sex marriage policies and adolescent suicide attempts. *JAMA Pediatr* 2017;171(4):350–6. [PubMed: 28241285]
25. Hatzenbuehler ML, O'Cleirigh C, Grasso C, Mayer K, Safren S, Bradford J. Effect of same-sex marriage laws on health care use and expenditures in sexual minority men: a quasi-natural experiment. *Am J Public Health* 2012;102(2):285–91. [PubMed: 22390442]
26. Oldenburg CE, Perez-Brumer AG, Hatzenbuehler ML, et al. State-level structural sexual stigma and HIV prevention in a national online sample of HIV-uninfected MSM in the United States. *AIDS* 2015;29(7):837–45. [PubMed: 25730508]
27. Earnshaw VA, Chaudoir SR. From conceptualizing to measuring HIV stigma: a review of HIV stigma mechanism measures. *AIDS Behav* 2009;13(6):1160–77. [PubMed: 19636699]
28. Zou G A modified Poisson regression approach to prospective studies with binary data. *Am J Epidemiol* 2004;159:702–6. [PubMed: 15033648]
29. Stahlman S, Sanchez TH, Sullivan PS, et al. The prevalence of sexual behavior stigma affecting gay men and other men who have sex with men across sub-Saharan Africa and in the United States. *JMIR Public Health Surveill* 2016;2(2):e35. [PubMed: 27460627]
30. Kutner BA, Simoni JM, King KM, et al. Does stigma toward anal sexuality impede HIV prevention among men who have sex with men in the United States? A structural equation modeling assessment. *J Sex Med* 2020;17(3):477–90. [PubMed: 31932256]
31. Furukawa NW, Maksut JL, Zlotorzynska M, et al. Sexuality disclosure in U.S. gay, bisexual, and other men who have sex with men: impact on healthcare-related stigmas and HIV pre-exposure prophylaxis denial. *Am J Prev Med* 2020;59(2):e79–87. [PubMed: 32376144]
32. 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;56:24–31.



**Fig. 1.** Reported measures of provider-patient communication by same-sex marriage legality in participants’ state of residence. \* Indicates p-value < 0.05, \*\* indicates p-value < 0.01, and \*\*\* indicates p-value < 0.001. This figure depicts the percentage of participants who responded affirmatively to survey questions related to provider-patient communication—if they are comfortable discussing with primary care providers that they have had sex with a man, discussing with their primary care provider having had condomless sex with a man, and discussing with their primary care provider ways to prevent sexual transmission of HIV—by whether or not same-sex marriage was legal in their state of residence at the time of data collection in 2013



**Fig. 2.** PrEP awareness and use by measures of provider-patient communication about sex. \* Indicates p-value < 0.05, \*\* indicates p-value < 0.01, and \*\*\* indicates p-value < 0.001. This figure depicts the percentage of participants who report PrEP awareness (a) and PrEP use (b) by whether they responded affirmatively or negatively to survey questions that asked if they are comfortable discussing with primary care providers that they have had sex with a man, discussing with their primary care provider having had condomless sex with a man, and discussing with their primary care provider ways to prevent sexual transmission of HIV

**Table 1**

Exposure status and demographic characteristics of sample (N = 3296)

Characteristic	No.	%
Live in state where same-sex marriage is legal	965	29.3
Comfortable discussing having sex with a man	1813	55.0
Have discussed having condomless sex with a man	1207	36.6
Have discussed ways to prevent sexual transmission of HIV	1282	38.9
Age group		
18–24 years	165	5.0
25–34 years	551	16.7
35–44 years	700	21.2
45–54 years	1071	32.5
55–64 years	631	19.1
65+ years	178	5.4
Ethnicity/Race		
Non-Hispanic White	2830	85.9
Non-Hispanic Black	110	3.3
Non-Hispanic Native American	64	1.9
Non-Hispanic Asian	77	2.3
Non-Hispanic Multiracial	58	1.8
Hispanic/Latino	212	6.4
Annual income		
Less than \$30,000	740	22.5
\$30,000–\$59,999	956	29.0
\$60,000 or more	1600	48.5
Educational attainment		
High school degree or less	190	5.8
Some college	709	21.5
College degree	1007	30.6
Some graduate work or graduate/professional degree	1390	42.2
Any health insurance	3081	93.5

Ethnicity/race categories are not mutually exclusive

**Table 2**

Associations between living in a state where same-sex marriage is legal and measures of provider-patient communication, PrEP awareness, and PrEP use (N = 3296)

Outcomes	Report outcome of interest (n, %)	Do not report outcome of interest (n, %)	Crude prevalence ratio (95% CI)	Adjusted prevalence ratio (95% CI) <sup>a</sup>
Previously aware of PrEP	350 (35.0)	615 (26.8)	1.30 (1.17, 1.45)	1.27 (1.14, 1.41)
Used PrEP	18 (41.9)	947 (29.1)	1.74 (0.95, 3.17)	1.61 (0.89, 2.90)
Comfortable discussing having sex with a man	576 (31.8)	389 (26.2)	1.12 (1.05, 1.20)	1.13 (1.06, 1.21)
Have discussed having condomless sex with a man	420 (34.8)	545 (26.1)	1.29 (1.18, 1.41)	1.29 (1.18, 1.41)
Have discussed ways to prevent sexual transmission of HIV	416 (32.5)	549 (27.3)	1.16 (1.06, 1.27)	1.15 (1.05, 1.26)

Estimates are prevalence ratios (PR) and adjusted prevalence ratios (aPR) based on Poisson regression analyses with robust variance

<sup>a</sup> Adjusted for race/ethnicity, age group, educational attainment, household income, and health insurance status

**Table 3**  
Associations between measures of provider-patient communication and PrEP awareness (N = 3296)

Exposure status	Previously aware of PrEP (n, %)	Previously unaware of PrEP (n, %)	Crude prevalence ratio (95% CI)	Adjusted prevalence ratio (95% CI) <sup>a</sup>
Comfortable discussing having sex with a man	667 (66.8)	1146 (49.9)	1.64 (1.47, 1.84)	1.63 (1.46, 1.82)
Have discussed having condomless sex with a man	498 (49.9)	709 (30.9)	1.72 (1.55, 1.90)	1.65 (1.49, 1.82)
Have discussed ways to prevent sexual transmission of HIV	477 (47.8)	805 (35.1)	1.44 (1.30, 1.59)	1.39 (1.26, 1.54)

Estimates are prevalence ratios (PR) and adjusted prevalence ratios (aPR) based on Poisson regression analyses with robust variance

<sup>a</sup> Adjusted for race/ethnicity, age group, educational attainment, household income, and health insurance status



**Table 4**  
Associations between measures of provider-patient communication and PrEP use (N = 3296)

Exposure status	Used PrEP (n, %)	Never used PrEP (n, %)	Crude prevalence ratio (95% CI)	Adjusted prevalence ratio (95% CI) <sup>a</sup>
Comfortable discussing having sex with a man	38 (88.4)	1775 (54.6)	6.22 (2.45, 15.76)	6.08 (2.41, 15.35)
Have discussed having condomless sex with a man	32 (74.4)	1175 (36.1)	5.03 (2.55, 9.95)	4.62 (2.34, 9.12)
Have discussed ways to prevent sexual transmission of HIV	35 (81.4)	1247 (38.3)	6.87 (3.20, 14.77)	6.55 (3.04, 14.11)

Estimates are prevalence ratios (PR) and adjusted prevalence ratios (aPR) based on Poisson regression analyses with robust variance

<sup>a</sup>Adjusted for race/ethnicity, age group, educational attainment, household income, and health insurance status