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Grace Beasley

# Exploring the effect of religion and religiosity on sexual risk and HIV prevention uptake among sexual and gender minority people in the southern United States

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By

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B.S., Stanford University, 2021

Thesis Committee Chair: Jeb Jones, PhD, MPH, MS

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# Abstract

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By Grace Beasley

Sexual and gender minority (SGM) populations in the United States are disproportionately affected by HIV, particularly in the southern United States. SGM populations face significant barriers to HIV treatment and prevention services in this region, ranging from geographical to cultural. Little is known about religion and religiosity as a cultural influence on the sexual health behaviors of SGM in the South and the potential associations with HIV prevention uptake. In this analysis we examine the impact of religious upbringing and current affiliation, importance of religion, and religious disapproval of homosexuality on key sexual risk behaviors and HIV prevention uptake. We found lower PrEP use among Christians and those for whom religion was important, but higher PrEP use among those with non-Christian upbringings. Those for whom religion was important were also less likely to have had an HIV test in the last 12 months. We did not find meaningful differences in sexual risk behaviors or awareness of PrEP before the survey. The unique influence religion holds in health behaviors among SGM people in the South offers an opportunity for further investigation of mediators of the relationship and potential avenues for intervention to reduce the current disparities in new HIV diagnoses present in the region.

# Exploring the effect of religion and religiosity on sexual risk and HIV prevention uptake among sexual and gender minority people in the southern United States

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## Introduction

In the United States, men who have sex with men (MSM) are disproportionately affected by HIV, with 66% of new diagnoses in 2019 attributed to male-to-male sexual contact [1]. Southern states, defined by the U.S. Census Bureau as Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia, continue to report some of the United States' highest rates of new HIV diagnoses. In 2019, the South accounted for 38% of the nation's population but accounted 51% and 43% of new cases among MSM and transgender adults and adolescents, respectively [1, 2]. Similarly, in 2018 the South reported the highest rate of new HIV diagnoses among nonmetropolitan populations in the country [3]. Intersectional minoritized populations bore a disproportionate burden of new diagnoses. Nationally, Black/African American adult and adolescent transgender women and transgender men made up 46% and 41% of new diagnoses, respectively. In the South, of the new diagnoses reported among MSM, 47% occurred among Black MSM and 28% occurred among Hispanic MSM [1]. The magnitude of these disparities becomes further apparent when considering that Black and Hispanic MSM are estimated to make up just 14% and 15% of the MSM population in the South [4].

Despite such high rates of new diagnoses, access to care and uptake of prevention tools, like testing, condom use, and chemoprophylaxis, in the South remain low in comparison to other parts of the U.S. One such tool, pre-exposure prophylaxis (PrEP) is a highly effective method of preventing HIV in at-risk individuals [5, 6]. However, patients must visit a licensed provider four times annually to continue receiving the prescription [7]. In addition to disproportionately limited

geographic access to PrEP providers in particular, MSM and gender non-conforming people in the South face similarly limited access to LGBTQ+ competent health care in general [8, 9]. Access in rural areas is further impeded by sociocultural barriers, like lack of appropriate sex education and fear of stigmatization, which are often enhanced in such small communities [10-12]. These barriers extend beyond PrEP to uptake of additional prevention behaviors like condom use and routine HIV and STI testing and are only amplified among intersectional minoritized populations [13, 14].

Each of the barriers faced by MSM and gender-nonconforming individuals in the South are impacted to some degree by complex sociocultural factors, though the questions of "how" and "to what extent" remain unclear for many of these influences. One such factor with immense reach is religion. In early campaigns to stop the spread of sexually transmitted infections (STIs) in the United States, religious organizations took up the cause and promoted rhetoric linking poor morality and STIs, further increasing the stigma associated with STIs and decreasing healthcare providers' willingness to openly engage in providing sex education [15]. For decades, abstinence-only sex education has received widespread private and governmental support, despite no evidence of effectiveness in reducing STIs, teen pregnancy, and number of sexual partners or increasing the average age of first sexual encounter [16, 17]. Moreover, this approach often entirely excludes LGBTQ+ identities and issues [18].

Even with such a broad impact at a societal level, religion at the individual level is immensely personal and varies in influence. Religiosity can be defined as "the intensity and consistency of practice of a person's (or group's) faith," which differs from spirituality in that religiosity requires the involvement of an organized entity with shared faith practices while spirituality often focuses on an individual's journey to purpose through some sort of higher power [19, 20]. Religiosity and spirituality have been associated with positive clinical outcomes, self-

reported physical health, and mental health in a variety of populations living with chronic diseases, including those living with HIV [21, 22]. However, the influence of religion and religiosity on preventative behaviors is less understood. Some studies suggest a positive correlation between religiosity/spirituality and the use of preventative care among the elderly, while others show mixed or no influence on health care-seeking behavior in other demographics [23-25]. With respect to sexual health in particular, religiosity has a negative association with utilization of reproductive health services among women, and similarly, conservative religious backgrounds are associated with decreased openness of communication about sex among college students [26, 27].

The impact of religion and religiosity on sexual health among sexual and gender minorities is further complicated by the heterogeneity of rhetoric and stances on LGBTQ+ issues between religions and the consequences of such beliefs. The religious landscape in the southern United States is predominantly Christian, specifically Evangelical Protestant, Catholic, Mainline Protestant, and Historically Black Protestant, which are observed by 34%, 15%, 14%, and 11% of the southern population, respectively [28]. Of these, the majority hold firmly in their disapproval of LGBTQ+ identities and rights [29]. While investigations of the effect of this rhetoric on the health of LGBTQ+ individuals indicate some protective and some hazardous associations with certain mental health outcomes, affiliation and attendance to non-affirming religious organizations has consistently been linked to significantly elevated internalized homophobia [30, 31]. Additionally, in qualitative studies, religiosity in socially conservative environments has emerged as a major theme in negative healthcare experiences of rural southern MSM and as a barrier to accessing HIV testing, and religious teachings, faith, and religious leaders have been cited as sources of intolerant beliefs toward Black MSM in particular [32-34]. Consequently, with such mixed results and the complex nature of religion, little is known about the association between

religiosity and HIV prevention behaviors among MSM and gender non-conforming individuals in the southern United States.

In this analysis, we investigate the effect of individual religiosity, religious affiliation, and religious upbringing on HIV prevention and risk behaviors among MSM and gender non-conforming people in the U.S. South. Prevention behaviors studied include HIV and STI testing, PrEP use, and awareness of PrEP, and HIV risk behaviors include number of sexual partners, condomless anal sex, and number of sexual partners with whom participants engaged in anal sex. Because of the increased level of religiosity in rural America compared with urban centers and the decreased access to comprehensive sexual healthcare among rural MSM, we will evaluate rurality as a potential modifier [35, 36]. In light of the negative associations between religiosity and both utilization of reproductive health services and openness of communication regarding sex in more general populations, and the often hazardous effect of religiously based anti-LGBTQ+ rhetoric on internalized stigma and negative healthcare experiences among MSM, we expect to find lower uptake of prevention behaviors in those reporting religious affiliations and upbringings. Similarly, we expect that higher religiosity and affiliation with non-affirming faiths will also have a negative association with prevention behaviors.

## Methods

*Study*

The data utilized in this analysis were obtained via a cross-sectional survey to identify preferences for a sexual health app and to describe sexual behavior and sexual healthcare uptake among sexual and gender minority populations in the US South [37]. Participants were recruited

primarily via online recruitment on social media platforms, sexual networking apps, and other sites frequently used by MSM. Some offline recruitment was conducted through flyers and promotion of the study by community partners. Additionally, men who completed the American Men's Internet Survey (AMIS) and consented to be contacted for future research studies were recruited via email [38].

*Study population*

Participants were eligible if they were 18-34 years of age, assigned male at birth or assigned female at birth and identify as any gender other than cisgender female, and resided in the South, as defined by the U.S. Census Bureau. Those who did not report having anal sex with a man in the past 6 months, being HIV-negative at their last HIV test or never having been tested for HIV, or being tested for any STIs in the past 12 months were not eligible for the study. Due to the overall study objective of identifying mobile app preferences, participants were also required to have an Android or iOS device with active service, be willing to download the study app, and be an English speaker.

*Analysis*

Primary prevention behavior outcomes included the following: HIV testing in the last 12 months, STI testing in the last 12 months, awareness of PrEP prior to survey, and history of PrEP use. Response options for these variables included "Yes," "No," "Don't Know," and "Prefer not to answer," or exclusively "Yes" and "No" for awareness of PrEP prior to survey. For the four-level response coding, responses of "Don't know" and "Prefer not to answer" were coded as missing for the purpose of analysis. Key risk behavior outcomes included condomless anal sex in

the last 6 months, total number of sexual partners in last 6 months, and number of sexual partners with whom participants engaged in anal sex. Condomless sex was dichotomously coded as yes or no. Both measures of sexual partners were dichotomized to the following categories: 1 or fewer and 2 or more.

The primary exposures of interest were current religious affiliation and religious upbringing. Response options provided to participants for both variables included Christian, Catholic, Baptist, Methodist, Lutheran, Presbyterian, Episcopalian, Pentecostal, other Christian, Non-Christian, Jewish, Muslim, Buddhist, Hindu, Unitarian/Universalist, No religion, No religion/Atheist/Agnostic, and other. Due to small sample sizes in many of the religious affiliations at this level of granularity, data was aggregated into "Christian," "Non-Christian," and "No religion." "Christian" included the following affiliations: Christian, Catholic, Baptist, Methodist, Lutheran, Presbyterian, Episcopalian, Pentecostal, and other Christian. "Non-Christian" included Non-Christian, Jewish, Muslim, Buddhist, Hindu, and Unitarian/Universalist. The remaining affiliations were categorized as "No religion."

Bivariate logistic regression models with predictive margins were used to estimate crude and adjusted prevalence ratios between prevention and risk outcomes and the religion exposures. Point estimates and 95% confidence intervals were calculated using SAS (version 9.4) and SAS-callable SUDAAN functions (version 11.0.4). Adjusted models controlled for age group (18-24, 25-29, and 30-34 years of age), rurality as defined by the index of relative rurality [39] (urban or rural), race/ethnicity (Hispanic, non-Hispanic Black, non-Hispanic White, and non-Hispanic other/multiracial), educational attainment (high school or lower, some college, and college graduate or more), and gender identity (male and transgender or gender non-conforming). Models of prevention behaviors and religion controlled for the aforementioned variables as well as

condomless anal sex in the last 6 months. Covariates were selected using a directed acyclic graph approach.

For participants who reported a religious affiliation, either current or raised, an exploratory sub-analysis was conducted to estimate the impact of religiosity and religious stance on homosexuality on HIV risk and prevention behaviors. Religiosity was measured by self-reported importance of religion in a participant's life. To the following question, "organized religion is important in my life," participants responded either, "Strongly agree," "Agree," "Neutral," "Disagree," "Strongly disagree," or "Not Applicable." Similarly, religious stance on homosexuality was measured through responses to two statements: "my current religion disapproves of homosexuality," and "the religion in which I was raised disapproves of homosexuality." Possible responses were consistent with those offered for importance of religion. For all three variables, responses were collapsed to "Agree," "Neutral," and "Disagree," with responses of "Not applicable" coded as missing. Similar to the primary analyses, crude and adjusted models were fit to estimate the association between the above exposures and the aforementioned risk and prevention outcomes. Covariates included in the adjusted models were the same as those in the primary analyses.

Prevalence ratios were not estimated for PrEP awareness by religious upbringing or religious stance on homosexuality due to lack of model convergence because of sparse data.

## Results

A total of 576 participants were included in this analysis. Demographic and behavioral characteristics of the sample are detailed in Table 1. Overall, participants were predominantly male

(84.9%) and had at least a college degree (47.4%), with an average age of 26.8 years old (SD: 4.4). The majority resided in urban areas (68.3%). The largest proportion of participants were non-Hispanic White (50.6%), while 22.5%, 18.3%, and 8.6% of participants were non-Hispanic Black, Hispanic, and non-Hispanic other/multiracial, respectively. The proportion of participants in each faith category differed between religious background and current affiliation, with the majority reporting a Christian background (85.1%) but no current religion (58.5%). Of those who reported a current religious affiliation, importance of religion was nearly evenly split between important (39.3%), neutral (34.3%), and not important (26.4%). Most current religions had disapproving or neutral stances on homosexuality, 47.2% and 20.2%, respectively, while the religions in which participants were raised were mostly disapproving of homosexuality (79.8%).

While the majority reported sexual behaviors that increase the risk of HIV, participants' prevention behaviors were mixed. Most participants reported condomless anal sex (83.1%), 2 or more sexual partners (70.3%), and condomless anal sex with 2 or more sexual partners (55.0%) in the six months prior to completing the survey. In terms of prevention behaviors, most had been tested for HIV (77.4%) and at least one STI (70.8%) in the last 12 months. The overwhelming majority were aware of PrEP before the survey (97.7%). Despite high awareness, 63.5% of participants had never used PrEP.

Current religious affiliation and religious background had mixed associations with prevention behaviors among participants. In unadjusted analyses, Christian participants were 33% less likely to have ever used PrEP than those who reported no current religion (prevalence ratio (PR) = 0.67, 95% CI: 0.52 – 0.88). Although this association remained after adjustment, its magnitude diminished with Christian participants 25% less likely to have ever used PrEP than those with no current religion (adjusted PR (aPR) = 0.75, 95% CI: 0.58 – 0.97). In contrast, those

with a non-Christian background were 1.58 times more likely to have ever used PrEP than those who had no religious background (95% CI: 1.02 – 2.44). When covariates were adjusted for, this association increased to 1.71 (95% CI: 1.09 – 2.68). There did not appear to be a significant association between HIV testing, STI testing, or awareness of PrEP and either current religion or religious upbringing. Similarly, no significant associations were observed between HIV risk behaviors and either of the religious affiliation exposures.

Participants who reported that religion is an important part of their life were 18% less likely to have had an HIV test in the past 12 months than those for whom religion was not important (95% CI: 0.68 – 0.99). The association remained the same after adjustment (aPR = 0.82, 95% CI: 0.68 – 0.98). Similarly, those for whom religion was important were 46% less likely to have ever used PrEP than those for whom religion was not important (95% CI: 0.33 – 0.87), which was slightly attenuated from the crude association (cPR = 0.50, 95% CI: 0.31 – 0.81). No significant associations were observed between importance of religion and the remaining risk and prevention outcomes. Further, the stance on homosexuality taken by the religion a participant was currently affiliated with and the religions in which participants were raised showed no association with the outcomes included in this analysis.

## Discussion

In this analysis, we explored the relationship between certain facets of religion and HIV risk and prevention behaviors among MSM and gender non-conforming individuals in the southern United States. Overall, there were associations between current religion and PrEP use, religious upbringing and PrEP use, and importance of religion and both HIV testing and PrEP use. Christians

were 25% less likely to have used PrEP than those who reported no religion, while those with non-Christian upbringings were 42% more likely to have ever used PrEP than those with no religious upbringing. Similarly, those for whom religion was important were 18% less likely to have had an HIV test in the past 12 months and 46% less likely to have ever used PrEP than those for whom religion was not important.

Several factors could account for the decreased use of PrEP among Christians and those for whom religion is important. We did not observe a meaningful difference in awareness of PrEP across religious categories and levels of importance, suggesting that this disparity is likely not due to a lack of awareness. Conservative religious beliefs and environments have emerged as major negative themes in qualitative studies of healthcare experiences of MSM in rural America and southern states, which in turn have been linked to decreased disclosure of sexual and gender identities to providers [40, 41]. Lack of provider awareness in turn reduces the likelihood of receiving appropriate prevention counseling and care [42]. Non-disclosure to healthcare providers influenced by either individual religious beliefs or sociocultural factors like fear of stigmatization could be one mechanism of action creating the observed differences in PrEP use. Further, a similar mechanism could be at play in the decreased likelihood of having had an HIV test in the past 12 months among those for whom religion was important. Additional research needs to be conducted in order to better understand the mediators present in this relationship, and thus provide insight into how to adapt prevention efforts to the needs of these communities.

We did not find meaningful differences in sexual behaviors across religions, backgrounds, degrees of religiosity, or religious stance on homosexuality. Previous studies of sexual behaviors among religious MSM have largely focused on specific intersectional faith organizations and have found mixed, in some cases contradictory, results [43, 44]. The heterogeneity of religious identities

in our sample likely affects our findings. Even within the same denominations, the experience of religion can be highly variable from person to person making it difficult to discern true associations with the level of granularity present in this analysis. With that said, the lack of meaningful differences remains somewhat unexpected due to the well-established link between non-affirming religious affiliation and increased internalized stigma, and, separately, the link between internalized homophobia and increased sexual behaviors with higher risk of HIV [10, 31]. With such a wide variety of suggested relationships, continued study of the link between religion and risk behaviors is needed, likely at a more granular level of religion, to best understand the different impacts differing belief systems may have on MSM and gender non-conforming individuals within their organizations.

This analysis has several limitations. The Combine study was conducted with the primary purpose of understanding the acceptability and willingness to engage with a mobile health app and sampling was conducted with this primary objective in mind. Recruiting was conducted primarily online which opens the door for exclusion of individuals without access to internet service, however the growing reach of smart phones and internet in rural areas suggests the bias introduced from this recruiting strategy is likely small [45]. Similarly, recruitment was limited to English speakers. While there are some counties, predominantly in Texas and Florida, in which high proportions of residents speak English less than "very well," 76% of Latinx people in the U.S. within the age group sampled in this study were proficient in English, thus limiting the potential selection bias resulting from the eligibility criterion [46, 47]. Barriers like fear of stigmatization and concerns of confidentiality consistent with those that impede accessing care among MSM may dissuade participants from more conservative and disapproving religions and backgrounds from participating. With respect to our sub-analysis of religiosity and stance on homosexuality, the

statistical power of our analysis was hindered by the limited sample size when further restricting the study population to only those who reported either a current religion or a religious background.

In conclusion, the relationship observed between PrEP use and religious affiliation and importance even after adjustment suggests influence on sexual health behaviors of sexual and gender minorities in the South. Religion remains largely unaddressed in efforts to improve reach of PrEP and other HIV prevention and care services. In a region where aspects of religion are almost ubiquitous, we must consider the implications of religion as an upstream influence on the lives and decisions made by sexual and gender minority people in such areas. Further research would benefit from recruiting individuals from a broader range of religious backgrounds and investigating potential mediators of the relationship, like internalized homophobia, fear of stigmatization, and concerns of non-confidentiality. Addressing the disproportionate burden of new HIV cases borne by MSM and gender non-conforming individuals in the southern United States requires a multifaceted approach tailored in some ways to the unique barriers faced in the region, and understanding and incorporating the role of religion in HIV prevention will be necessary to successfully reduce these disparities.

# References


1. Centers for Disease Control and Prevention. *HIV Surveillance Report, 2019*; vol.32. http://www.cdc.gov/hiv/library/reports/hiv-surveillance.html. Published May 2021. Accessed October 2, 2022
2. U.S. Census Bureau. *2019 U.S. Population Estimates Continue to Show the Nation's Growth Is Slowing*; Press Release Number CB19-198. https://www.census.gov/newsroom/press-releases/2019/popest-nation.html. Published December 30 2019. Accessed November 29, 2022
3. Center for Disease Control and Prevention. *HIV Surveillance in Urban and Nonurban Areas Report, 2018*; vol.31. https://www.cdc.gov/hiv/pdf/library/slidesets/cdc-hiv-surveillance-urban-nonurban-2018.pdf. Published 2020. Accessed October 29, 2022
4. Lieb S, Thompson DR, Misra S, Gates GJ, Duffus WA, Fallon SJ, Liberti TM, Foust EM, Malow RM; Southern AIDS Coalition MSM Project Team. Estimating populations of men who have sex with men in the southern United States. J Urban Health. 2009 Nov;86(6):887-901. doi: 10.1007/s11524-009-9401-4. PMID: 19911282; PMCID: PMC2791823.
5. Smith D, Herbst J, Zhang X, Rose C. Condom Effectiveness for HIV Prevention by Consistency of Use Among Men Who Have Sex With Men in the United States. *Journal of Acquired Immune Deficiency Syndrome*. 2015;68(3):337-344. doi: 10.1097/QAI.0000000000000461
6. McCormack S, Dunn D, 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. *The Lancet*. 2015;387(10013):53-60. doi:https://doi.org/10.1016/S0140-6736(15)00056-2

7. Centers for Disease Control and Prevention: US Public Health Service: Preexposure prophylaxis for the prevention of HIV infection in the United States—2021 Update: a clinical practice guideline. https://www.cdc.gov/hiv/pdf/risk/prep/cdc-hiv-prep-guidelines-2021.pdf. Published 2021.
8. Siegler A, Bratcher A, and Weiss K. Geographic access to preexposure prophylaxis clinics among men who have sex with men in the United States. *American Journal of Public Health*. 2019; 109(9): 1216-1223. doi:10.2105/AJPH.2019.305172
9. Hammack P, Meyer I, Krueger E, et al. HIV testing and pre-exposure prophylaxis (PrEP) use, familiarity, and attitudes among gay and bisexual men in the United States: A national probability sample of three birth cohorts. *PLOS ONE*. 2018; https://doi.org/10.1371/journal.pone.0202806
10. Preston DB, D'Augelli AR, Kassab CD, Starks MT. The relationship of stigma to the sexual risk behavior of rural men who have sex with men. AIDS Education and Prevention. 2007Jun;19(3):218–30.
11. Hubach R, Currin J, Sanders C, et al. Barriers to access an adoption of Pre-Exposure prophylaxis for the prevention of HIV among men who have sex with men (MSM) in a relatively rural state. *AIDS Education and Prevention*.2017;29(4): 315-329.
12. Currin J, Huback R, Durham A, et al. How gay and bisexual men compensate for the lack of meaningful sex education in socially conservative states. *Sex Education*. 2017; 17(6): 667-681

13. Giano Z, Kavanaugh K, Durham A, et al. Factors associated with condom use among a sample of men who have sex with men (MSM) residing in rural Oklahoma. *Journal of Homosexuality*. 2020; 67(13): 1881-1901.
14. Babel RA, Wang P, Alessi EJ, Raymond HF, Wei C. Stigma, HIV risk, and access to HIV prevention and treatment services among men who have sex with men (MSM) in the United States: A scoping review. AIDS and Behavior. 2021;25(11):3574–604.
15. Ford J, Barnes R, Rompalo A, et al. Sexual Health Training and Education in the U.S. *Public Health Reports*. 2013; 128(Suppl 1): 96-101.
16. Stanger-Hall KF, Hall DW. Abstinence-only education and teen pregnancy rates: Why we need comprehensive sex education in the U.S. PLoS ONE. 2011;6(10).
17. Abstinence education programs: Definition, funding, and impact on teen sexual behavior [Internet]. Kaiser Family Foundation. 2018 [cited 2023Apr12]. Available from: https://www.kff.org/womens-health-policy/fact-sheet/abstinence-education-programs-definition-funding-and-impact-on-teen-sexual-behavior/
18. Elia JP, Eliason MJ. Dangerous omissions: Abstinence-only-until-marriage school-based sexuality education and the betrayal of LGBTQ youth. American Journal of Sexuality Education. 2010Apr13;5(1):17–35.
19. Crossman A. How do you study the sociology of religion? [Internet]. ThoughtCo. ThoughtCo; 2019 [cited 2023Apr12]. Available from: https://www.thoughtco.com/sociology-of-religion-3026286
20. Musgrave CF, Allen CE, Allen GJ. Spirituality and health for women of color. American Journal of Public Health. 2002Apr;92(4):557–60.

21. Doolittle, B.R., Justice, A.C. & Fiellin, D.A. Religion, Spirituality, and HIV Clinical Outcomes: A Systematic Review of the Literature. *AIDS Behav* 22, 1792–1801 (2018). https://doi.org/10.1007/s10461-016-1651-z
22. Jim HS, Pustejovsky JE, Park CL, Danhauer SC, Sherman AC, Fitchett G, et al. Religion, spirituality, and physical health in cancer patients: A meta-analysis. Cancer. 2015Nov1;121(21):3760–8.
23. Reindl Benjamins M, Brown C. Religion and preventative health care utilization among the elderly. Social Science & Medicine. 2004Jan;58(1):109–18.
24. Cheatham CT, Barksdale DJ, Rodgers SG. Barriers to health care and health-seeking behaviors faced by black men. Journal of the American Academy of Nurse Practitioners. 2008 Oct31;20(11):555–62.
25. Ransford HE, Carrillo FR, Rivera Y. Health care-seeking among Latino immigrants: Blocked access, use of traditional medicine, and the role of religion. Journal of Health Care for the Poor and Underserved. 2010Aug;21(3):862–78.
26. Santelli J, Grilo S, Choo T, et al. Does sex education before college protect students from sexual assault in college? *PLOS ONE*. 2018. https://doi.org/10.1371/journal.pone.0205951
27. Hall KS, Moreau C, Trussell J. Lower use of sexual and reproductive health services among women with frequent religious participation, regardless of sexual experience. Journal of Women's Health. 2012Jul;21(7):739–47.
28. "Religious Landscape Study: Adults in the South." Pew Research Center, Washington, D.C. (2014): https://www.pewresearch.org/religion/religious-landscape-study/region/south/

29. Masci D, Lipka M. Where Christian churches, other religions stand on Gay Marriage [Internet]. Pew Research Center. Pew Research Center; 2020 [cited 2023Apr12]. Available from: https://www.pewresearch.org/fact-tank/2015/12/21/where-christian-churches-stand-on-gay-marriage/

30. Kralovec K, Fartacek C, Fartacek R, Plöderl M. Religion and suicide risk in lesbian, gay and Bisexual Austrians. Journal of Religion and Health. 2012Oct9;53(2):413–23.

31. Barnes DM, Meyer IH. Religious affiliation, internalized homophobia, and mental health in lesbians, gay men, and bisexuals. American Journal of Orthopsychiatry. 2012Oct;82(4):505–15.

32. Balaji A, Oster A, Viall A, et al. Role Flexing: How community, religion, and family shape the experiences of young black men who have sex with men. *AIDS Patient Care and STDs*. 2012;26(12). https://doi.org/10.1089/apc.2012.0177

33. Quinn, Katherine and Dickson-Gomez, Julia. Homonegativity, religiosity, and the intersecting identities of young Black men who have sex with men. *AIDS and Behavior*. 2016; 20: 51-64. https://doi.org/10.1007/s10461-015-1200-1

34. Giano Z, Hubach RD, Meyers HJ, et al. Assessing the Health Care Experiences of Rural Men Who Have Sex with Men (MSM). *Journal of Health Care for the Poor and Underserved*. 2020;31(1):235–248.

35. Lyons L. Age, religiosity, and rural America [Internet]. Gallup.com. Gallup; 2023 [cited 2023Apr12]. Available from: https://news.gallup.com/poll/7960/age-religiosity-rural-america.aspx

36. Jones J, Zlotorzynska M, Villarino X, Sanchez T. Where is Rural? Examining the Effect of Rural Classification Method on Disparities in HIV and STI Testing Uptake Among

Men Who Have Sex with Men in the United States. AIDS Behav. 2022 Sep;26(9):2897-2906. doi: 10.1007/s10461-022-03635-3. Epub 2022 Mar 4. PMID: 35244818; PMCID: PMC8895072.

37. Jones J, Stephenson R, Edwards OW, Merrill L, Martinez CA, Sullivan PS. Willingness to Participate in and Preferences for Studies of mHealth HIV Prevention Interventions: Cross-Sectional Study Among Sexual and Gender Minority Groups in the Southern United States. AIDS Behav. 2023 Feb 4. doi: 10.1007/s10461-023-04005-3. Epub ahead of print. PMID: 36738343.
38. Sanchez TH, Sineath RC, Kahle EM, Tregear SJ, Sullivan PS. The Annual American Men's Internet Survey of Behaviors of Men Who Have Sex With Men in the United States: Protocol and Key Indicators Report 2013. JMIR Public Health Surveill. 2015 Apr 17;1(1):e3. doi: 10.2196/publichealth.4314. PMID: 27227126; PMCID: PMC4869242.
39. Waldorf BS. A continuous multi-dimensional measure of rurality: Moving beyond threshold measures [Internet]. 2006. Available from: https://ageconsearch.umn.edu/record/21383.
40. Qiao S, Zhou G, Li X. Disclosure of Same-Sex Behaviors to Health-care Providers and Uptake of HIV Testing for Men Who Have Sex With Men: A Systematic Review. *American Journal of Men's Health*. 2018;12(5):1197-1214. doi:10.1177/1557988318784149
41. Giano Z, Hubach RD, Meyers HJ, DeBoy KR, Currin JM, Wheeler DL, et al. Assessing the Health Care Experiences of Rural Men Who Have Sex with Men (MSM). Journal of Health Care for the Poor and Underserved. 2020;31(1):235–48.

42. Petroll AE, Mosack KE. Physician awareness of sexual orientation and preventive health recommendations to men who have sex with men. Sex Transm Dis. 2011 Jan;38(1):63-7.

43. Garofalo R, Kuhns LM, Hidalgo M, Gayles T, Kwon S, Muldoon AL, et al. Impact of religiosity on the sexual risk behaviors of young men who have sex with men. The Journal of Sex Research. 2015;52(5):590–8.

44. Watkins T, Simpson C, Cofield S, Davies S, Kohler C, Usdan S. The Relationship between HIV risk, high-risk behavior, religiosity, and spirituality among Black men who have sex with men (MSM): an exploratory study. Journal of Religion and Health. 2016;55:535-548.

45. Pew Research Center. Demographics of mobile device ownership and adoption in the United States [Internet]. 2021 [cited 2023 April 13]. Available https://www.pewresearch.org/internet/fact-sheet/mobile/

46. U.S. Census Bureau. People that speak English less than " very well" in the United States [Internet]. 2020 [cited 2023 April 13]. Available https://www.census.gov/library/visualizations/interactive/people-that-speak-english-less-than-very-well.html

47. Krogstad JM. Rise in English proficiency among U.S. hispanics is driven by the young [Internet]. Pew Research Center. Pew Research Center; 2016 [cited 2023Apr13]. Available from: https://www.pewresearch.org/fact-tank/2016/04/20/rise-in-english-proficiency-among-u-s-hispanics-is-driven-by-the-young/#:~:text=Rise%20in%20English%20proficiency%20among%20U.S.%20Hispanics%20is%20driven%20by%20the%20young&text=English%20proficiency%20among%20U.S.%20Latinos,analysis%20of%20Census%20Bureau%20data.

# Tables

**Table 1. Characteristics of participants by current religious affiliation**

| | | Current religious affiliation | | |
|---|---|---|---|---|
| | Total | Christian | Non-christian | No religion |
| | n (%) | n (%) | n (%) | n (%) |
| **Total observations** | 576 | 198 (34.4) | 41 (7.1) | 337 (58.5) |
| **Age (years)** | | | | |
| 18 - 24 | 175 (30.4) | 59 (29.8) | 11 (26.8) | 105 (31.2) |
| 25 - 29 | 227 (39.4) | 76 (38.4) | 17 (41.5) | 134 (39.8) |
| 30 - 34 | 174 (30.2) | 63 (31.8) | 13 (31.7) | 98 (29.1) |
| Mean age (SD) | 26.8 (4.4) | | | |
| **Race/Ethnicity** | | | | |
| Hispanic | 105 (18.3) | 34 (17.2) | 8 (19.5) | 63 (18.9) |
| Non-hispanic Black | 129 (22.5) | 71 (35.9) | 7 (17.1) | 51 (15.3) |
| Non-hispanic White | 290 (50.6) | 84 (42.4) | 20 (48.8) | 186 (55.7) |
| Other/Multiracial | 49 (8.6) | 9 (4.6) | 6 (14.6) | 34 (10.2) |
| **Educational attainment** | | | | |
| High school or lower | 106 (18.5) | 46 (23.2) | 6 (14.6) | 54 (16.1) |
| Some college | 196 (34.2) | 63 (31.8) | 13 (31.7) | 120 (35.8) |
| College graduate or more | 272 (47.4) | 89 (45.0) | 22 (53.7) | 161 (48.1) |
| **Gender Identity** | | | | |
| Male | 488 (84.9) | 188 (95.0) | 32 (78.1) | 268 (79.8) |
| Transgender or gender-nonconforming | 87 (15.1) | 10 (5.1) | 9 (22.0) | 68 (20.2) |
| **IRR Rurality status** | | | | |
| Urban | 389 (68.3) | 134 (68.4) | 28 (70.0) | 227 (68.0) |
| Rural | 181 (31.8) | 62 (31.6) | 12 (30.0) | 107 (32.0) |
| **Attendance at organized religious events** | | | | |
| Never | 60 (25.1) | 44 (22.2) | 16 (39.0) | N/A |
| Rarely | 118 (49.4) | 100 (50.5) | 18 (43.9) | N/A |
| Often | 61 (25.5) | 54 (27.3) | 7 (17.1) | N/A |

**Table 1. Characteristics of participants by current religious affiliation (continued)**

| | | Current religious affiliation | | |
|---|---|---|---|---|
| | Total | Christian | Non-christian | No religion |
| | n (%) | n (%) | n (%) | n (%) |
| **Religious upbringing** | | | | |
| Christian | 490 (85.1) | 192 (97.0) | 28 (68.3) | 270 (80.1) |
| Non-christian | 31 (5.4) | 0 (0) | 12 (29.3) | 19 (5.6) |
| No religion | 55 (9.6) | 6 (3.0) | 1 (2.4) | 48 (14.2) |
| **Importance of Religion** | | | | |
| Disagree | 63 (26.4) | 47 (23.7) | 16 (39.0) | N/A |
| Neutral | 82 (34.3) | 72 (36.4) | 10 (24.4) | N/A |
| Agree | 94 (39.3) | 79 (39.9) | 15 (36.6) | N/A |
| **Current religion affirming of homosexuality** | | | | |
| Non-affirming | 110 (47.2) | 102 (52.0) | 8 (21.6) | N/A |
| Neutral | 47 (20.2) | 40 (20.4) | 7 (18.9) | N/A |
| Affirming | 76 (32.6) | 54 (27.6) | 22 (59.5) | N/A |
| **Religious upbringing affirming of homosexuality** | | | | |
| Non-affirming | 412 (79.8) | 400 (82.5) | 12 (41.9) | N/A |
| Neutral | 57 (11.1) | 51 (10.5) | 6 (19.4) | N/A |
| Affirming | 47 (9.1) | 34 (7.0) | 13 (41.9) | N/A |
| **HIV test in the last 12 months** | | | | |
| Yes | 398 (77.4) | 138 (78.9) | 25 (67.6) | 235 (77.8) |
| No | 108 (21.0) | 37 (21.1) | 11 (29.7) | 60 (19.9) |
| **STI test in the last 12 months** | | | | |
| Yes | 332 (70.8) | 110 (71.0) | 19 (57.6) | 203 (72.2) |
| No | 134 (28.6) | 45 (29.0) | 14 (42.4) | 75 (26.7) |
| **Condomless anal sex in last 6 mo** | | | | |
| Yes | 432 (83.1) | 142 (78.5) | 27 (79.4) | 263 (86.2) |
| No | 88 (16.9) | 39 (21.6) | 7 (20.6) | 42 (13.8) |

**Table 1. Characteristics of participants by current religious affiliation (continued)**

| | | Current religious affiliation | | |
|---|---|---|---|---|
| | Total | Christian | Non-christian | No religion |
| | n (%) | n (%) | n (%) | n (%) |
| **Number of sexual partners in last 6 months** | | | | |
| 1 or fewer | 171 (29.7) | 58 (29.3) | 12 (29.3) | 101 (30.0) |
| 2 or more | 405 (70.3) | 140 (70.7) | 29 (70.7) | 236 (70.0) |
| **Number of sexual partners with whom engaged in anal sex in last 6 months** | | | | |
| 1 or fewer | 259 (45.0) | 92 (46.5) | 19 (46.3) | 148 (43.9) |
| 2 or more | 317 (55.0) | 106 (53.5) | 22 (53.7) | 189 (56.1) |
| **PrEP use** | | | | |
| Ever | 207 (36.1) | 54 (27.3) | 19 (46.3) | 134 (40.1) |
| Never | 364 (63.5) | 144 (72.7) | 21 (51.2) | 199 (59.6) |
| **Awareness of PrEP before survey** | | | | |
| Yes | 563 (97.7) | 189 (95.5) | 40 (97.6) | 334 (99.1) |
| No | 13 (2.3) | 9 (4.6) | 1 (2.4) | 3 (0.9) |

**Table 2. Granular view of participant religions**

| | Current religious affiliation *n (%)* | Religious upbringing *n (%)* |
|---|---|---|
| **Total observations** | 576 | 575 |
| **Christian** | | |
| Christian | 106 (18.4) | 191 (33.2) |
| Catholic | 27 (4.7) | 120 (20.9) |
| Baptist | 26 (4.5) | 101 (17.6) |
| Methodist | 8 (1.4) | 24 (4.2) |
| Lutheran | 1 (0.2) | 6 (1.0) |
| Presbyterian | 4 (0.7) | 7 (1.2) |
| Episcopalian | 7 (1.2) | 6 (1.0) |
| Pentecostal | 3 (0.5) | 13 (2.3) |
| Other Christian | 16 (2.8) | 22 (3.8) |
| **Non-Christian** | | |
| Non-Christian | 12 (2.1) | NA |
| Jewish | 10 (1.7) | 12 (2.1) |
| Muslim | 5 (0.9) | 7 (1.2) |
| Buddhist | 8 (1.4) | 5 (0.9) |
| Hindu | 1 (0.2) | 3 (0.5) |
| Unitarian/Universalist | 5 (0.9) | 4 (0.7) |
| **No Religion** | | |
| No religion | 148 (25.7) | 27 (4.7) |
| No religion/Atheist/Agnostic | 154 (26.7) | 19 (3.3) |
| Other | 35 (6.1) | 8 (1.4) |

**Table 3. Concordance between current religious affiliation and religious upbringing**

| | Religious upbringing | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Christian | | | | | | | | |
| | Christian n (%) | Catholic n (%) | Baptist n (%) | Methodist n (%) | Lutheran n (%) | Presbyterian n (%) | Episcopalian n (%) | Pentecostal n (%) | Other Christian n (%) |
| **Current religious affiliation** | | | | | | | | | |
| **Christian** | | | | | | | | | |
| Christian | 71 (67.6) | 7 (6.7) | 19 (18.1) | 2 (1.9) | 0 (0) | 0 (0) | 1 (1.0) | 3 (2.9) | 0 (0) |
| Catholic | 3 (11.1) | 24 (88.9) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Baptist | 2 (7.7) | 0 (0) | 24 (92.3) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Methodist | 0 (0) | 0 (0) | 1 (12.5) | 6 (75.0) | 0 (0) | 1 (12.5) | 0 (0) | 0 (0) | 0 (0) |
| Lutheran | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (100.0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Presbyterian | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 2 (50.0) | 0 (0) | 0 (0) | 0 (0) |
| Episcopalian | 0 (0) | 1 (14.3) | 2 (28.6) | 0 (0) | 0 (0) | 0 (0) | 1 (14.3) | 1 (14.3) | 2 (28.6) |
| Pentecostal | 1 (33.3) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 2 (66.7) | 0 (0) |
| Other Christian | 4 (25.0) | 0 (0) | 5 (31.3) | 2 (12.5) | 0 (0) | 0 (0) | 0 (0) | 1 (6.3) | 3 (18.8) |
| **Non-Christian** | | | | | | | | | |
| Non-Christian | 3 (25.0) | 3 (25.0) | 3 (25.0) | 0 (0) | 0 (0) | 1 (8.3) | 0 (0) | 0 (0) | 1 (8.3) |
| Jewish | 1 (10.0) | 2 (20.0) | 0 (0) | 0 (0) | 1 (10.0) | 0 (0) | 0 (0) | 0 (0) | 1 (10.0) |
| Muslim | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Buddhist | 0 (0) | 2 (25.0) | 3 (37.5) | 0 (0) | 0 (0) | 1 (12.5) | 0 (0) | 0 (0) | 1 (12.5) |
| Hindu | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Unitarian/Universalist | 3 (60.0) | 0 (0) | 1 (20.0) | 0 (0) | 0 (0) | 0 (0) | 1 (20.0) | 0 (0) | 0 (0) |
| **No Religion** | | | | | | | | | |
| No religion | 48 (32.4) | 40 (27.0) | 17 (11.5) | 6 (4.1) | 2 (1.4) | 0 (0) | 1 (0.7) | 4 (2.7) | 4 (2.7) |
| No religion/Atheist/Agnostic | 41 (26.6) | 37 (24.0) | 20 (13.0) | 7 (4.6) | 2 (1.3) | 2 (1.3) | 2 (1.3) | 2 (1.3) | 8 (5.2) |
| Other | 14 (40.0) | 4 (11.4) | 6 (17.1) | 1 (2.9) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 2 (5.7) |

**Table 3. Concordance between current religious affiliation and religious upbringing (continued)**

| | Religious upbringing | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Non-Christian | | | | | | No religion | | |
| | Non-Christian n (%) | Jewish n (%) | Muslim n (%) | Buddhist n (%) | Hindu n (%) | Unitarian/Universalist n (%) | No religion n (%) | No religion/Atheist/Agnostic n (%) | Other n (%) |
| **Current religious affiliation** | | | | | | | | | |
| **Christian** | | | | | | | | | |
| Christian | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (1.0) | 1 (1.0) | 0 (0) | |
| Catholic | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | |
| Baptist | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | |
| Methodist | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | |
| Lutheran | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | |
| Presbyterian | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (25.0) | 1 (25.0) | |
| Episcopalian | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | |
| Pentecostal | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | |
| Other Christian | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (6.3) | |
| **Non-Christian** | | | | | | | | | |
| Non-Christian | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (8.3) | |
| Jewish | 5 (50.0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | |
| Muslim | 0 (0) | 5 (100.0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | |
| Buddhist | 0 (0) | 0 (0) | 1 (12.5) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | |
| Hindu | 0 (0) | 0 (0) | 0 (0) | 1 (100.0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | |
| Unitarian/Universalist | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | |
| **No Religion** | | | | | | | | | |
| No religion | 2 (1.4) | 1 (0.7) | 3 (2.0) | 0 (0) | 2 (1.4) | 16 (10.8) | 2 (1.4) | 0 (0) | |
| No religion/Atheist/Agnostic | 5 (3.3) | 1 (0.7) | 1 (0.7) | 2 (1.3) | 2 (1.3) | 7 (4.6) | 13 (8.4) | 2 (1.3) | |
| Other | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 3 (8.6) | 2 (5.7) | 3 (8.6) | |

**Table 4. Crude and adjusted prevalence ratios for HIV risk and prevention outcomes and religious affiliation among sexual and gender minority people living in the southern United States**

| | Crude Models | | Adjusted Models* | |
|---|---|---|---|---|
| | PR | 95% CI | PR | 95% CI |
| **Outcomes** | | | | |
| Condomless anal sex | | | | |
| Christian | 1.01 | (0.90 - 1.13) | 0.90 | (0.82 - 0.99) |
| Non-Christian | 1.01 | (0.82 - 1.25) | 0.94 | (0.80 - 1.11) |
| No Religion *(Ref)* | | | | |
| Total sexual partners in last 6 months | | | | |
| Christian | 1.01 | (0.90 - 1.13) | 0.97 | (0.87 - 1.10) |
| Non-Christian | 1.01 | (0.82 - 1.25) | 1.03 | (0.85 - 1.25) |
| No Religion (Ref) | | | | |
| Sexual partners engaged in anal sex in last 6 months | | | | |
| Christian | 0.95 | (0.81 - 1.12) | 0.89 | (0.75 - 1.05) |
| Non-Christian | 0.96 | (0.71 - 1.29) | 0.98 | (0.74 - 1.29) |
| No Religion (Ref) | | | | |
| HIV Testing | | | | |
| Christian | 0.98 | (0.89 - 1.08) | 0.96 | (0.87 - 1.07) |
| Non-Christian | 0.88 | (0.71 - 1.09) | 0.80 | (0.60 - 1.06) |
| No Religion *(Ref)* | | | | |
| STI Testing | | | | |
| Christian | 0.97 | (0.86 - 1.10) | 0.99 | (0.87 - 1.12) |
| Non-Christian | 0.79 | (0.58 - 1.06) | 0.86 | (0.64 - 1.14) |
| No Religion *(Ref)* | | | | |
| PrEP use: ever | | | | |
| Christian | 0.67 | (0.52 - 0.88) | 0.75 | (0.58 - 0.97) |
| Non-Christian | 1.21 | (0.86 - 1.70) | 1.25 | (0.88 - 1.77) |
| No Religion *(Ref)* | | | | |
| PrEP awareness | | | | |
| Christian | 0.96 | (0.93 - 0.99) | 0.97 | (0.57 - 1.64) |
| Non-Christian | 0.98 | (0.94 - 1.03) | 0.73 | (0.49 - 1.11) |
| No Religion *(Ref)* | | | | |

* Adjusted models for risk outcomes control for age, race, educational attainment, and IRR rurality. Adjusted models for prevention behaviors control for age, race, educational attainment, IRR rurality, and condomless sex.

**Table 5. Crude and adjusted prevalence ratios for HIV risk and prevention outcomes and religious upbringing among sexual and gender minority people in the southern United States**

| | Crude Models | | Adjusted Models* | |
|---|---|---|---|---|
| | PR | 95% CI | PR | 95% CI |
| **Outcomes** | | | | |
| Condomless anal sex | | | | |
| Christian | 0.92 | (0.83 - 1.02) | 0.91 | (0.82 - 1.01) |
| Non-Christian | 0.82 | (0.63 - 1.07) | 0.80 | (0.59 - 1.09) |
| No Religion *(Ref)* | | | | |
| Total sexual partners in last 6 months | | | | |
| Christian | 0.93 | (0.79 - 1.10) | 0.95 | (0.80 - 1.13) |
| Non-Christian | 1.04 | (0.81 - 1.33) | 1.07 | (0.83 - 1.38) |
| No Religion (Ref) | | | | |
| Sexual partners engaged in anal sex in last 6 months | | | | |
| Christian | 0.91 | (0.72 - 1.14) | 0.94 | (0.75 - 1.17) |
| Non-Christian | 0.91 | (0.62 - 1.35) | 0.90 | (0.60 - 1.35) |
| No Religion (Ref) | | | | |
| HIV Testing | | | | |
| Christian | 0.89 | (0.79 - 1.00) | 0.91 | (0.81 - 1.02) |
| Non-Christian | 0.89 | (0.71 - 1.12) | 0.90 | (0.71 - 1.14) |
| No Religion *(Ref)* | | | | |
| STI Testing | | | | |
| Christian | 0.89 | (0.76 - 1.04) | 0.87 | (0.76 - 1.01) |
| Non-Christian | 0.82 | (0.61 - 1.11) | 0.89 | (0.66 - 1.19) |
| No Religion *(Ref)* | | | | |
| PrEP use: ever | | | | |
| Christian | 0.89 | (0.62 - 1.27) | 0.96 | (0.67 - 1.35) |
| Non-Christian | 1.58 | (1.02 - 2.44) | 1.71 | (1.09 - 2.68) |
| No Religion *(Ref)* | | | | |

* Adjusted models for risk outcomes control for age, race, educational attainment, and IRR rurality. Adjusted models for prevention behaviors control for age, race, educational attainment, IRR rurality, and condomless sex.

**Table 6. Crude and adjusted prevalence ratios for HIV risk and prevention outcomes and importance of religion among sexual and gender minority people living in the southern United States**

| | Crude Models | | Adjusted Models* | |
|---|---|---|---|---|
| | PR | 95% CI | PR | 95% CI |
| **Outcomes** | | | | |
| Condomless anal sex | | | | |
| Important | 0.98 | (0.82 - 1.17) | 1.00 | (0.84 - 1.22) |
| Neutral | 1.02 | (0.86 - 1.22) | 1.01 | (0.83 - 1.20) |
| Not important *(Ref)* | | | | |
| Total sexual partners in last 6 months | | | | |
| Important | 0.84 | (0.68 - 1.04) | 0.87 | (0.70 - 1.08) |
| Neutral | 1.03 | (0.85 - 1.24) | 1.02 | (0.83 - 1.25) |
| Not important *(Ref)* | | | | |
| Sexual partners engaged in anal sex in last 6 months | | | | |
| Important | 0.78 | (0.57 - 1.07) | 0.81 | (0.59 - 1.11) |
| Neutral | 1.07 | (0.81 - 1.41) | 1.04 | (0.77 - 1.41) |
| Not important *(Ref)* | | | | |
| HIV Testing | | | | |
| Important | 0.82 | (0.68 - 0.99) | 0.82 | (0.68 - 0.98) |
| Neutral | 1.00 | (0.86 - 1.17) | 0.96 | (0.82 - 1.14) |
| Not important *(Ref)* | | | | |
| STI Testing | | | | |
| Important | 0.97 | (0.76 - 1.24) | 0.97 | (0.76 - 1.24) |
| Neutral | 1.03 | (0.81 - 1.32) | 1.08 | (0.86 - 1.36) |
| Not important *(Ref)* | | | | |
| PrEP use: ever | | | | |
| Important | 0.50 | (0.31 - 0.81) | 0.54 | (0.33 - 0.87) |
| Neutral | 0.77 | (0.5 - 1.17) | 0.89 | (0.58 - 1.38) |
| Not important *(Ref)* | | | | |
| PrEP awareness | | | | |
| Important | 0.97 | (0.90 - 1.04) | 0.98 | (0.65 - 1.47) |
| Neutral | 1.01 | (0.95 - 1.07) | 1.04 | (0.75 - 1.44) |
| Not important *(Ref)* | | | | |

* Adjusted models for risk outcomes control for age, race, educational attainment, and IRR rurality. Adjusted models for prevention behaviors control for age, race, educational attainment, IRR rurality, and condomless sex.

**Table 7. Crude and adjusted prevalence ratios for HIV risk and prevention outcomes and perceived disapproval of homosexuality in current religion among sexual and gender minority people living in the southern United States**

| | Crude Models | | Adjusted Models* | |
|---|---|---|---|---|
| | PR | 95% CI | PR | 95% CI |
| **Outcomes** | | | | |
| Condomless anal sex | | | | |
| Religion non-affirming | 1.02 | (0.87 - 1.21) | 1.05 | (0.88 - 1.25) |
| Religion neutral | 1.03 | (0.85 - 1.25) | 1.03 | (0.83 - 1.27) |
| Religion affirming (Ref) | | | | |
| Total sexual partners in last 6 months | | | | |
| Religion non-affirming | 1.08 | (0.89 - 1.32) | 1.08 | (0.88 - 1.33) |
| Religion neutral | 1.11 | (0.88 - 1.40) | 1.08 | (0.86 - 1.37) |
| Religion affirming (Ref) | | | | |
| Sexual partners engaged in anal sex in last 6 months | | | | |
| Religion non-affirming | 1.15 | (0.86 - 1.54) | 1.08 | (0.79 - 1.46) |
| Religion neutral | 1.30 | (0.94 - 1.81) | 1.24 | (0.89 - 1.72) |
| Religion affirming (Ref) | | | | |
| HIV Testing | | | | |
| Religion non-affirming | 1.08 | (0.90 - 1.29) | 1.00 | (0.83 - 1.22) |
| Religion neutral | 1.16 | (0.94 - 1.42) | 1.07 | (0.85 - 1.34) |
| Religion affirming (Ref) | | | | |
| STI Testing | | | | |
| Religion non-affirming | 1.17 | (0.92 - 1.49) | 1.04 | (0.83 - 1.32) |
| Religion neutral | 1.23 | (0.93 - 1.63) | 1.06 | (0.81 - 1.38) |
| Religion affirming (Ref) | | | | |
| PrEP use: ever | | | | |
| Religion non-affirming | 0.90 | (0.59 - 1.37) | 1.06 | (0.71 - 1.60) |
| Religion neutral | 0.81 | (0.46 - 1.41) | 0.69 | (0.38 - 1.25) |
| Religion affirming (Ref) | | | | |

* Adjusted models for risk outcomes control for age, race, educational attainment, and IRR rurality. Adjusted models for prevention behaviors control for age, race, educational attainment, IRR rurality, and condomless sex.

**Table 8. Crude and adjusted prevalence ratios for HIV risk and prevention outcomes and perceived disapproval of homosexuality in religious upbringing among sexual and gender minority people living in the southern United States**

| | Crude Models | | Adjusted Models* | |
|---|---|---|---|---|
| | PR | 95% CI | PR | 95% CI |
| **Outcomes** | | | | |
| Condomless anal sex | | | | |
| Religion non-affirming | 1.18 | (0.96 - 1.44) | 1.22 | (0.97 - 1.53) |
| Religion neutral | 1.02 | (0.79 - 1.32) | 1.05 | (0.79 - 1.39) |
| Religion affirming (Ref) | | | | |
| Total sexual partners in last 6 months | | | | |
| Religion non-affirming | 0.93 | (0.78 - 1.12) | 0.98 | (0.80 - 1.19) |
| Religion neutral | 0.94 | (0.74 - 1.20) | 0.97 | (0.75 - 1.25) |
| Religion affirming (Ref) | | | | |
| Sexual partners engaged in anal sex in last 6 months | | | | |
| Religion non-affirming | 1.02 | (0.77 - 1.36) | 1.11 | (0.82 - 1.49) |
| Religion neutral | 1.09 | (0.77 - 1.54) | 1.12 | (0.77 - 1.62) |
| Religion affirming (Ref) | | | | |
| HIV Testing | | | | |
| Religion non-affirming | 0.94 | (0.80 - 1.09) | 0.96 | (0.81 - 1.15) |
| Religion neutral | 0.96 | (0.79 - 1.18) | 0.97 | (0.78 - 1.21) |
| Religion affirming (Ref) | | | | |
| STI Testing | | | | |
| Religion non-affirming | 0.96 | (0.78 - 1.18) | 1.04 | (0.83 - 1.32) |
| Religion neutral | 0.98 | (0.75 - 1.29) | 1.06 | (0.81 - 1.38) |
| Religion affirming (Ref) | | | | |
| PrEP use: ever | | | | |
| Religion non-affirming | 1.11 | (0.73 - 1.69) | 1.06 | (0.71 - 1.60) |
| Religion neutral | 0.77 | (0.43 - 1.40) | 0.69 | (0.38 - 1.25) |
| Religion affirming (Ref) | | | | |

* Adjusted models for risk outcomes control for age, race, educational attainment, and IRR rurality. Adjusted models for prevention behaviors control for age, race, educational attainment, IRR rurality, and condomless sex.