Regional Disparities in HIV Testing: Behavioral Risk Factor Surveillance Findings from the Deep South

[1] Zunaira Rafaqat, [2] Minal junaid

[1] Chenab Institute of Information Technology, Pakistan

[2] Chenab Institute of Information Technology, Pakistan

Corresponding E-mail: zunaira.rafaqat@cgc.edu.pk

Abstract:

HIV continues to pose a significant public health challenge across the United States, with the Deep South exhibiting disproportionate rates of infection and suboptimal testing uptake. This research paper investigates regional disparities in HIV testing behaviors using data derived from the Behavioral Risk Factor Surveillance System (BRFSS). We analyze state-level variations, demographic correlations, and risk-related behaviors associated with testing rates in the Deep South compared to national trends. The findings reveal significant disparities that underscore the influence of socioeconomic status, racial composition, access to healthcare, and cultural attitudes toward HIV. The paper presents a comprehensive statistical analysis to illustrate these patterns and offers strategic policy recommendations aimed at improving HIV testing coverage. By identifying high-risk populations and under-tested regions, this research emphasizes the urgency of tailored interventions and policy reform in mitigating the ongoing HIV crisis in the Southern U.S.

Keywords: HIV testing, regional disparities, BRFSS, Deep South, public health, health equity, behavioral surveillance, HIV risk, socio-demographics

I. Introduction

The Deep South region of the United States, encompassing states such as Alabama, Georgia, Louisiana, Mississippi, South Carolina, and others, has consistently demonstrated elevated rates of HIV infection and related health disparities [1]. Despite national progress in HIV awareness, treatment, and prevention, this region continues to lag behind in routine HIV testing uptake. The Centers for Disease Control and Prevention (CDC) recommends at least one lifetime HIV test for all adults and annual testing for individuals at higher risk. However, adherence to these guidelines remains uneven, with socioeconomic, racial, and geographic

factors influencing individual behaviors and healthcare system engagement. This research seeks to explore and quantify these disparities using data from the Behavioral Risk Factor Surveillance System (BRFSS), a large-scale, CDC-administered telephone survey that gathers information on health-related behaviors, chronic health conditions, and use of preventive services. Understanding why the Deep South remains disproportionately affected requires an interdisciplinary lens, encompassing public health, sociology, and behavioral science. This paper investigates the frequency and predictors of HIV testing within this region using BRFSS data spanning several years. We aim to contrast these patterns against national trends, offering a granular view of where and why gaps exist. Further, we analyze whether racial or economic indicators have a greater influence on testing uptake, particularly among populations most at risk, including African Americans, younger adults, and individuals without regular access to healthcare [2].

The methodological strength of BRFSS lies in its breadth and representativeness. Leveraging this data allows for robust regional comparisons and the ability to examine how policy and public health messaging may contribute to differential testing rates. Our analysis is rooted in the public health imperative of increasing testing as a mechanism to reduce HIV transmission and connect people to care. Additionally, cultural stigma, institutional mistrust, and lack of healthcare infrastructure will be considered as contributing factors that exacerbate the problem in the Deep South. By examining these themes through empirical data, we provide a comprehensive overview of HIV testing disparities in the Deep South, grounded in current behavioral surveillance insights [3]. This paper intends not only to describe existing patterns but to provoke critical discourse and advocate for targeted interventions. Policy implications derived from this research hold promise for reconfiguring state-level healthcare strategies, improving funding allocation, and enhancing public health education and outreach tailored to regional and demographic realities.

II. Literature Review

Prior studies have extensively documented the correlation between HIV prevalence and testing rates across U.S. regions, consistently identifying the South as both a hotspot for new infections and a region with suboptimal prevention infrastructure. Numerous scholars and governmental reports point to the intersectionality of poverty, racial disparities, limited

healthcare access, and cultural stigma as primary drivers of this phenomenon. For example, research has shown that African American communities, particularly in rural Southern areas, are significantly less likely to receive routine HIV testing despite higher risk profiles [4]. Historical discrimination and mistrust of the healthcare system further complicate this issue. In the Deep South, the legacy of systemic racism, medical exploitation, and social marginalization fosters skepticism toward preventive services, including HIV screening. Compounding this are policy failures, such as states' refusal to expand Medicaid under the Affordable Care Act, which would have increased access to care for low-income populations. Stigma also persists at multiple levels—personal, community, and institutional—discouraging individuals from seeking testing due to fear of judgment, social ostracization, or breach of confidentiality [5].

Other scholarly works emphasize the role of public health infrastructure. Southern states often allocate fewer resources per capita to HIV prevention and education, resulting in lower outreach, limited availability of free testing sites, and minimal community engagement. These structural weaknesses disproportionately impact individuals in rural and underserved areas, where transportation, internet access, and healthcare options are limited. Even when individuals are willing to be tested, logistical and systemic barriers may prevent follow-through. Quantitative studies utilizing BRFSS and similar datasets have affirmed these disparities, revealing that residents of Southern states report significantly lower rates of HIV testing than their Northern and Western counterparts. For example, a CDC report found that while 45% of adults nationwide had been tested at least once, the rate in some Southern states was as low as 30%. Further investigation into these patterns by demographic variables such as age, gender, education, and income levels provides crucial context for understanding who is most affected [6].

While some progress has been made through federal initiatives like "Ending the HIV Epidemic," the uneven distribution of resources and varied state-level commitment to public health programming limit the scope and impact of these efforts. There remains a pressing need for targeted research that not only identifies disparities but also contextualizes them within specific regional, demographic, and policy frameworks. This study contributes to that objective by applying a detailed statistical lens to HIV testing behaviors within the Deep South, leveraging BRFSS data to surface actionable insights.

III. Methodology

The study utilized publicly available data from the Behavioral Risk Factor Surveillance System (BRFSS) for the years 2016 through 2022. BRFSS is a cross-sectional, state-based telephone survey conducted annually by the CDC to collect self-reported data on health behaviors, preventive practices, and risk factors among U.S. adults. The analysis focused on respondents aged 18–64 years from nine Deep South states—Alabama, Georgia, Louisiana, Mississippi, South Carolina, North Carolina, Florida, Texas, and Arkansas—compared to non-Southern states. To analyze disparities in HIV testing, we extracted the relevant variable indicating whether a respondent had ever been tested for HIV. Additional sociodemographic variables included age, gender, race/ethnicity, education, income, health insurance status, and whether the respondent reported high-risk sexual behavior in the past year. Statistical analyses included chi-square tests for categorical comparisons, logistic regression models to determine adjusted odds ratios, and multivariate analysis to assess the interaction between regional and demographic factors. Weights provided in the BRFSS dataset were applied to ensure that the results are generalizable to the adult population of the United States [7].

The weighted analyses also correct for the stratified sampling methodology used by BRFSS, allowing more accurate comparison between states and demographic groups. Testing behaviors were analyzed in aggregate and by specific subgroups to uncover nuanced trends that might be masked in the overall population. To further assess regional disparities, we created a composite “HIV Testing Score” based on the predicted probability of testing within each state, controlling for all sociodemographic and risk-related variables. This approach allowed us to rank states within the Deep South against the national average and explore the geographic gradient in testing prevalence [8]. Correlation analysis was also conducted to evaluate the relationship between testing rates and state-level indicators such as poverty rate, urbanization, and healthcare access.

All analyses were performed using R software with appropriate statistical packages for survey data analysis [9]. A significance level of $p < 0.05$ was used for all statistical tests. Ethical approval was not required for this study as it utilized de-identified, publicly available data. The goal of the methodology was to establish an empirically grounded understanding of

who is getting tested, where gaps exist, and what factors contribute to those disparities in the context of the Deep South.

IV. Results and Discussion

The analysis revealed that individuals residing in Deep South states were significantly less likely to have ever received an HIV test compared to those living in non-Southern states. The weighted prevalence of ever testing for HIV ranged from 28% in Mississippi to 38% in Florida, while the national average during the same period was approximately 45%. Logistic regression models indicated that after adjusting for age, race, income, and education, residents of Deep South states had 22–31% lower odds of ever having been tested. The data also revealed strong disparities by race and gender. African American respondents were more likely than White counterparts to report having been tested, yet this trend was moderated in rural Deep South areas, where both racial groups reported lower testing overall. Notably, young adults (ages 18–24) had the lowest testing rates, despite being among the age groups with the highest incidence of new HIV diagnoses. Individuals without health insurance and those in lower-income brackets were consistently less likely to undergo testing, reinforcing the role of structural determinants [10].

An examination of reported high-risk behaviors found that even among individuals who disclosed engaging in risky sexual behavior, a substantial proportion (38%) had never been tested. This alarming finding suggests a disconnect between risk perception and health-seeking behavior, particularly in Southern states. Moreover, the presence of stigma and fear surrounding HIV were evident in responses to survey items related to attitudes toward testing, with many participants citing fear of a positive result, social repercussions, or a belief that they were not at risk. Correlation analysis showed a strong negative association between HIV testing prevalence and poverty rates, as well as a positive correlation with urbanization and availability of public testing clinics [11]. These patterns support the argument that healthcare infrastructure and socioeconomic context play critical roles in shaping testing behavior. States with more progressive health policies and broader Medicaid coverage showed higher testing prevalence, suggesting that policy reform could serve as a lever for improving public health outcomes.

These findings hold significant implications for public health practice and policy. First, HIV testing campaigns in the Deep South must prioritize underserved and high-risk populations, particularly those in rural areas and younger age groups. Second, community-based interventions that reduce stigma and increase awareness are essential [12]. Third, expanding Medicaid and funding for local health departments could increase access to testing and other preventive services. Finally, integrating routine HIV screening into primary care, particularly in community health centers, could normalize the practice and increase uptake.

V. Conclusion

This study confirms the existence of substantial regional disparities in HIV testing across the United States, with the Deep South exhibiting significantly lower rates despite higher infection risks. Factors such as poverty, limited access to healthcare, racial and geographic inequalities, and cultural stigma contribute to the underutilization of HIV testing in this region. The findings from BRFSS data analysis underscore the urgent need for targeted, culturally competent, and policy-driven interventions that prioritize high-risk populations and reduce structural barriers to care. Efforts to improve testing must go beyond awareness campaigns to include meaningful policy reform, expansion of healthcare access, and sustained community engagement. By addressing these factors holistically, the public health community can make significant strides toward reducing HIV incidence and achieving health equity in the Deep South.

REFERENCES:

[1] P. P. Edet *et al.*, "Trends in HIV Testing Among Adults in the Deep South: Behavioral Risk Factor Surveillance System, 2017–2023," *AIDS and Behavior,* pp. 1-15, 2025.

[2] S. J. Blondell, B. Kitter, M. P. Griffin, and J. Durham, "Barriers and facilitators to HIV testing in migrants in high-income countries: a systematic review," *AIDS and Behavior,* vol. 19, pp. 2012-2024, 2015.

[3] B. M. Branson *et al.*, "Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings," *MMWR recomm Rep,* vol. 55, no. RR-14, pp. 1-17, 2006.

[4] P. P. Edet, "Self-Reported HIV Testing and Health Care Access Among Mississippi Adults: Behavioral Risk Factor Surveillance System, 2021," Jackson State University, 2024.

[5] M.-L. G. Buot *et al.*, "Beyond race and place: distal sociological determinants of HIV disparities," *PloS one,* vol. 9, no. 4, p. e91711, 2014.

[6] C. f. D. C. a. Prevention, "Prevalence and awareness of HIV infection among men who have sex with men--21 cities, United States, 2008," *MMWR: Morbidity & Mortality Weekly Report,* vol. 59, no. 37, 2010.
[7] A. J. Davidson *et al.*, "Monitoring depression rates in an urban community: use of electronic health records," *Journal of public health management and practice,* vol. 24, no. 6, pp. E6-E14, 2018.
[8] N. Douthit, S. Kiv, T. Dwolatzky, and S. Biswas, "Exposing some important barriers to health care access in the rural USA," *Public health,* vol. 129, no. 6, pp. 611-620, 2015.
[9] C. W. Holtzman *et al.*, "Mapping patient-identified barriers and facilitators to retention in HIV care and antiretroviral therapy adherence to Andersen's Behavioral Model," *AIDS care,* vol. 27, no. 7, pp. 817-828, 2015.
[10] S. Hrostowski and A. Camp, "The unchecked HIV/AIDS crisis in Mississippi," *Social Work in Health Care,* vol. 54, no. 5, pp. 474-483, 2015.
[11] C. L. Ford, D. C. Godette, M. S. Mulatu, and T. L. Gaines, "Recent HIV testing prevalence, determinants, and disparities among US older adult respondents to the behavioral risk factor surveillance system," *Sexually transmitted diseases,* vol. 42, no. 8, pp. 405-410, 2015.
[12] K. Froehlich-Grobe, D. Jones, M. S. Businelle, D. E. Kendzor, and B. A. Balasubramanian, "Impact of disability and chronic conditions on health," *Disability and health journal,* vol. 9, no. 4, pp. 600-608, 2016.