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Understanding the Role of Reactions to Race-based Treatment on HIV Testing Behaviors

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ABSTRACT

UNDERSTANDING THE ROLE OF REACTIONS TO RACE-BASED TREATMENT ON HIV TESTING BEHAVIORS

By

JOËLLE FOLSADÉ ATERE-ROBERTS

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INTRODUCTION: In the United States, Blacks and Hispanics compared to Whites are disproportionately infected with HIV. Testing for HIV is critical to reduce HIV transmission, lower risk behaviors, and improve access to treatment among persons living with HIV. However, racial & ethnic minorities are tested at later stages of HIV. Previous studies that examined racial discrimination and HIV testing reported inconsistent findings and additional knowledge is needed to understand whether differential treatment based on race is an important barrier to HIV testing.

AIM: We examined whether HIV testing is influenced by how an individual reacts to race-based treatment, rather than experiences of discrimination alone, among Whites, Blacks, and Hispanics; and we determined if this relationship was modified race and ethnicity.

METHODS: We performed a cross-sectional analysis of the 2012 Behavioral Risk Factor Surveillance System's (n=12,579) self-reported HIV testing data and Reaction to Race (RR) module, which captures experiences of differential treatment based on race and an individual's reaction to racialized treatment. Multivariable logistic regression was used to assess the association between RR-based treatment and HIV testing. Statistical interaction between RR-based treatment and race was assessed.

RESULTS: Approximately 21% participants reported ever being tested for HIV, and 19% of the participants had one or more experiences of RR-based treatment. Prevalence of HIV testing was higher among Blacks (62%) and Hispanics (33%) compared to Whites (32%). In an adjusted model, the odds of HIV testing among those who reported one experience of Reactions to Race based treatment was 1.37 (95% CI: 1.08-1.75) times the odds among those with no experiences of RR-based treatment. We did not detect statistical interaction between RR-based treatment and HIV testing by race.

DISCUSSION: Our findings suggest that experiences of racial discrimination may be counter intuitively associated with increased HIV testing overall and within each racial and ethnic group. Additional research is needed to clarify settings in which experiences of race-based treatment and the associated reactions to the treatment can positively or negatively influence HIV testing behaviors.

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Author's Statement Page

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Chapter I- Introduction

This thesis seeks to understand racial and ethnic disparities in HIV infection by examining the potential pathway through which experiences of racial discrimination can influence HIV testing behaviors. In the United States, Blacks and Hispanics are disproportionately infected with HIV compared to Whites.[1] Moreover, Blacks (15%) and Hispanics (15%) have the highest percentage of undiagnosed HIV infections compared to Whites (11%).[2] Existing research recognizes the critical role HIV testing plays in preventing HIV transmission through initiation of HIV treatment and reducing high-risk sexual and drug use behaviors among those who are HIV infected.[3] Therefore, an understanding of HIV testing behaviors among Blacks and Hispanics compared to Whites is crucial to understanding persistent racial and ethnic disparities in HIV.

While research has found that HIV testing rates are higher among Blacks and Hispanics compared to Whites,[4] a high percentage of Blacks (38%) and Hispanics (52%) report that they have never been tested for HIV in their lifetime compared to Whites (59%)[5] This suggests a continued need for improving HIV testing and prevention efforts among racial and ethnic minorities. Existing research has suggested that HIV testing barriers, for example fear of positive HIV status, lack of access to care, and misconceptions about HIV risk, may influence racial and ethnic disparities in HIV.[6-9]

A separate but growing body of literature has also indicated that racial discrimination, defined as differential treatment based on phenotypic race, may be an important predictor of HIV testing and racial and ethnic disparities in HIV. Racial discrimination is associated with a host of poor health outcomes and behaviors, which may partially account for many racial and ethnic health disparities. [10-13] For example, experiences of racial discrimination among marginalized groups has been associated with elevated blood pressure, negative mental health outcomes, and increased smoking behavior.[6-9] In the case of HIV testing, racial discrimination

results in a unique set of stressors among minorities, which triggers a response to racial stimuli that may negatively impact HIV testing behavior. High levels of stress are positively related to high-risk coping behaviors including sex and drug use and are negatively related to healthy behaviors including breast and prostate cancer screening.[11,14-17] The pathways by which racial discrimination can affect HIV testing may require different operationalization of racial discrimination, which would result in variability in how racial discrimination is measured.

A small body of literature on the relationship between racial discrimination and HIV testing, has counter intuitively shown a positive relationship where experiences of discrimination are associated with higher rates of HIV testing. However, the variability between the results of this existing literature is likely due to differences in the operationalization of discrimination. Different measures have been used to capture perceived acute experiences of discrimination, chronic experiences, and some literature with no clear distinction between the type(s) of discrimination being measured (Table I) [18].

Since studies have examined the association between experiences of racial discrimination and HIV testing, we address gaps in the literature by examining this relationship in a racially diverse sample. Given the mixed results of previous studies on racial discrimination & HIV testing, this research is critical in understanding the pathways by which racial discrimination can be detrimental or constructive in regard to seeking HIV testing. This research adds to the literature by examining not only the experience of racial discrimination, but also the individuals' reactions to the differential treatment based on race. Herein, we examined the association between Reactions to Race-based treatment and HIV testing behaviors within racial and ethnic groups; and we hypothesized that respondents who report Reactions to Race-based treatment have lower HIV testing prevalence and an interaction between race and ethnicity and Reactions to Race-based treatment with respect to HIV testing will be present. This thesis uses the Reactions to Race module measures, which captures 1) whether or not an individual

experiences racial discrimination, 2) whether an individual embodies the experiences, and 3) how an individual responds to race-based treatment.[19] In essence, the Reactions to Race scale captures an individual's experience of differential treatment based on race and whether or not an individual perceives that they experience a physical or emotional response to a racialized experience. Reactions to Race based treatment have been shown to be negatively related to poor self-rated health, lower breast cancer screening, lower colorectal cancer screening by endoscopy and digital rectal exam.[20-22]The next chapters delve into the existing literatures that assess HIV testing and health disparities, barriers to HIV testing, discrimination pathways on health behaviors, and the relationship between racial discrimination and HIV testing. Following the literature review, we will present the methods and findings of the proposed research question.

Chapter II-Literature Review

2.1 The role of HIV testing in reducing racial and ethnic disparities in HIV.

Racial and ethnic disparities in HIV transmission are pervasive in the US.[23] Blacks accounted for 47% of incident HIV infections and an estimated 43% of prevalent HIV infections in 2012. Additionally, Hispanics represented 16% of the US population in 2012 but accounted for over one-fifth (21%) of the new HIV infections and 19% of individuals living with HIV.[1] National estimates have found that of approximately 1.2 million people living with HIV infection in the United States, about 12.8%, most of whom are Black and Hispanic, are unaware of their HIV status.[24] Specifically, 17% of Blacks and 17% of Hispanics compared to only 13% of Whites (13%) have undiagnosed HIV infections.[2] Knowledge of HIV status is particularly important in reducing HIV transmission as previous studies have shown that knowledge of HIV status is associated with fewer high-risk behaviors, which would lower the risk for acquiring and/or transmitting HIV.[25,26] Individuals who are HIV-positive have increased rates of condom use during sex, lower rates of injection drug use, and decreased rates of sex in exchange for money after becoming aware of their HIV status.[27-30] Knowledge of HIV status is also important because, once an individual is diagnosed as HIV positive s/he can be linked to care and medical services that can reduce morbidity, mortality and improve quality of life.[31], Given this, HIV testing is a crucial part of HIV prevention, treatment, and care.[32]

Although studies show that HIV testing rates are higher among Blacks (59.7%) and Latinos (45.6%) compared to Whites (42.4%)[5], other data indicate important gaps in HIV testing among racial and ethnic minorities. For example, racial and ethnic minorities are more likely to be tested in later stages of infection and die from AIDS compared to whites.[4] Among those with HIV, 31% of Blacks and 36% of Hispanics compared to 32% of whites were tested in the late stages of illness, which is measured by being diagnosed with AIDS within one year of testing HIV positive.[33] This suggests an important gap in our understanding and ability to reach and test

racial and ethnic minorities who are farther along in the progression of HIV.[34] Murray and Oraka conducted a study using data from the National Health Interview Survey to understand HIV testing intentions by race and ethnicity.[35] The results revealed Whites (81%) and Asians (71%) had a significantly higher percentage of individuals who were never tested for HIV because they perceived themselves to be at low risk compared to Blacks (66%) and Hispanics (65%). On the other hand, Blacks and Hispanics had higher percentages of respondents who never received a HIV test due to fear of HIV-related stigma compared to other races. The results of this study gives insight on the varying levels of perceived risk of infection across racial and ethnic groups, which may be important to understand decisions to not be tested for some racial and ethnic minorities.

There are a number of ways that higher rates of HIV testing among racial and ethnic minorities might reduce high-risk behaviors to prevent transmission of the virus to others. First, those who test HIV positive and initiate antiretroviral treatment (ART) to achieve a suppressed viral load will have a lower likelihood of transmitting HIV to others.[36] Furthermore, an individual who tests positive for HIV can identify other sexual partners who are at risk and recommend HIV testing and/or encourage the use of pre-exposure prophylaxis to decrease their chance of getting infected.[37] Therefore, we should consider HIV testing not only as a diagnostic tool but also as an important HIV prevention strategy that could be important to reducing inequities in HIV by race and ethnicity.

2.2 Barriers to HIV testing among racial and ethnic minorities

The Centers for Disease Control and Prevention (CDC) recommends that adolescents and adults age 13-64 get tested for HIV at least once as a routine part of medical care, and even more frequent testing among men who have sex with men and other populations who engage in high risk behavior such as injection drug use and unprotected sex.[34] Although the rates of HIV testing have increased, approximately 55% of Americans have not been tested in

their lifetime.[38] Fear of a positive HIV diagnosis, misconceptions about HIV risk and HIV testing procedures, and lack of access to healthcare are key barriers to increasing HIV testing.[38] In a study on barriers to HIV testing among Hispanics, Lopez-Quintero et al found 75% of participants reported "not considering oneself to be at risk" as the primary reasons for not getting tested.[39] However, the study did not consider other social factors such as access to healthcare, discrimination, socioeconomic status etc. that could also influence respondents' reason for not being tested. In another study using data from the Web-based HIV Behavioral Surveillance (WHBS), MacKeller et al. show Black (37%) and Hispanic (21%) MSM reported fear of testing positive as a primary reason for not testing at higher rates compared to Whites (15%).[40] Bond et al. further examined the structural as well as individual-level barriers to HIV testing, and the authors found that structural-level measures including having a regular healthcare provider and the number of visits to the doctors were important correlates of HIV testing.[41]

Another important factor that may influence HIV testing may be physician recommendation. For example, a number of studies have shown that racial and ethnic minorities are less likely to be offered preventive, operative and other services in the healthcare setting. Specifically, in their study on socially assigned race and healthcare discrimination, MacIntosh et al. found that racial and ethnic minorities who were perceived socially as white were more likely to receive preventive vaccinations and less likely to report perceived healthcare discrimination.[42] So, it is possible that individuals who perceive differential treatment in a healthcare setting are less likely to receive important screening tests because of physician failure to offer and encourage testing.

2.3 Pathway for racial discrimination influencing health

Jones defines racial discrimination as "differential actions towards others by race that can influence health".[43] The research literature suggests that racial discrimination can influence

health through multiple pathways. Most discrimination research has focused on the psychosocial pathway, which posits that discrimination is a stressor that affects the neuroendocrine, autonomic, and immune systems.[44] Changes in various biological systems leads to physiological changes that influence cellular decay.[44] Individuals also often engage in high-risk coping behaviors that relieve stress but also put them at risk for poor health. Most of the research along this pathway has shown a positive relationship between racial discrimination, poor mental and physical health outcomes and negative health behaviors.[10 11-13] Specifically, discrimination is related to elevated blood pressure,[6,7] higher levels of depression,[8] increased smoking behaviors,[9] and increased alcohol use.[45]

Another pathway through which discrimination has been posited to affect health is through access to individual and macro-level resources.[11] On the individual level, Crawford et al argues that discrimination can lead to more high-risk social relationships that influence disease transmission and fewer health promoting social relationships that would advocate for healthier behaviors.[46] On the macro level, a very large body of literature has examined discrimination through an institutional lens whereby policies and community efforts segregate minorities from healthy residential environments.[16,47,48] Williams defines racial residential segregation as "the physical separation of races by enforced residence in certain areas."[47]. Racially segregated neighborhoods have been shown to have inadequate education, fewer recreational facilities, higher levels environmental hazards, fewer jobs, and limited access to medical care, which restrict the residents' ability to practice effective heath behaviors and result in negative health consequences among marginalized racial groups.[47] While we believe all of the pathways of discrimination are important and may have an influence on HIV testing behavior, this thesis argues that racial discrimination acts as a psychosocial stressor, which affects health, and results in coping behaviors that are negatively associated with HIV testing.

2.4 Racial Discrimination and HIV Testing Behavior

While theoretical frameworks of discrimination-health relationships[18] suggests that discrimination may influence HIV testing behavior, research examining the influence of racial discrimination on HIV testing behaviors is mixed.[10] Irvin et al. examined the relationship between healthcare-specific racial discrimination and HIV testing among black men who have sex with men (MSM).[49] Over 80% of participants who reported healthcare-specific discrimination had been tested for HIV within the last year and healthcare-specific racial discrimination was positively associated with HIV testing [OR=1.6 (95% confidence interval: 1.1, 2.4)]. In this study, healthcare specific racial discrimination was operationalized as unfair treatment due to race for the participant, a friend, family member, or someone they knew. Therefore, healthcare specific discrimination may have overestimated individual experiences of discrimination, which would positively bias the exposure estimate resulting in an attenuated relationship between discrimination and HIV testing. Furthermore, the measure included all healthcare-specific discrimination experiences over the lifetime and therefore the temporal relationship between discrimination and HIV testing could not be assessed. In another clinic-based study, Ford et al. examined the association between perceived everyday racism and HIV testing behavior among 373 Blacks seeking sexually transmitted disease (STD) testing in the deep South. This study showed that more than 90% of participants perceived everyday racism, which was associated with higher odds of receiving an HIV test [OR=1.64 (1.07,2.52)] .[10] Since this study was limited to a sample of Blacks, the relative difference in HIV testing with other racial and ethnic groups is unclear. Moreover, this study operationalized discrimination using the everyday discrimination scale, which captures chronic, routine, and relatively minor experiences of racial discrimination.[8] The items on the scale capture the day-to-day experiences of discrimination including differential treatment compared to others, being treated with less respect than others, receiving poorer quality service than others, viewed as not smart, viewed as dishonest, viewed as less than, called names/insulted, and being threatened or harassed.(Table I).[8] While Krieger et al.

showed that the everyday racism scale has strong validity and reliability[11], it is possible that experiences of racial discrimination in and of itself are not linked to HIV testing because it is not these everyday experiences that affect behaviors, but an individuals' response and ability to recover from these negative experiences in order to maintain a healthy state. In other words, if an individual has a racialized experience that they are unaware of or they are able to cope with the experience to "move on," we might not expect this to affect their health. On the other hand, if an individual has a racialized experience that causes them emotional or even physical strain and they have difficulty "moving on" from a negative experience, we would expect this rumination and perseverative cognition to affect their health.

Given that few studies have examined the relationship between discrimination and HIV testing, but a small piece of evidence counter intuitively suggests a positive relationship where experiences of discrimination predict higher HIV testing uptake, we will examine how reactions to race-based treatment affect HIV testing behaviors. This examination adds to the existing literature by 1) examining how an individuals' response to racial discrimination, not just an experience of racial discrimination alone, measured by the Reactions to Race module influences HIV testing behavior and 2) assessing this research question in a racially diverse sample for which we will be able to understand differences in experiences of reactions to racial discrimination and its relationship to HIV among non-Hispanic Whites, non-Hispanic Blacks and Hispanics.

2.5 Reactions to Race-based treatment and HIV testing

The Reactions to Race module captures personal experience and how an individual responded to differential treatment because of their race. This module has undergone several rounds of cognitive testing, field-testing, and pilot testing when it was launched by the CDC in 2002. Since being piloted, the six measures in the module have been operationalized individually and in combination with each other to assess the impact of race-based treatment on

various health behaviors and health outcomes.[20,22,50] Reliability and validity testing of the Reactions to Race based measures reveal that the module had adequate face validity, but may be limited in its reliability because this measure has not been replicated in another sample.[19,22]

In this analysis, we examine the association between Reactions to Race-based treatment and HIV testing behaviors among non-Hispanic White, non-Hispanic Black, and Hispanic individuals; and examine if the association between Reactions to Race-based treatment and HIV testing is modified by race/ethnicity using data from the 2012 Behavioral Risk Factor Surveillance System (BRFSS). We hypothesized that non-Hispanic White, non-Hispanic Black, and Hispanics who report Reactions to Race-based treatment would have significantly lower HIV testing prevalence and heterogeneity of effect between race and ethnicity and Reactions to Race-based treatment with respect to HIV testing will be present. Specifically, Non-Hispanic Blacks and Hispanic individuals who report Reactions to Race-based treatment will have a significantly lower HIV testing prevalence compared to non-Hispanic Whites.

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Chapter III-Manuscript

INTRODUCTION

Racial and ethnic disparities in HIV transmission, infection, and treatment are pervasive. In the United States, Blacks and Hispanics are disproportionately infected with HIV compared to Whites and have the highest percentage of undiagnosed HIV infections.[1,2] Specifically, 15% of Blacks and 15% of Hispanics have the undiagnosed HIV infections compared to 11% of Whites.[2] HIV testing plays a critical role in preventing HIV transmission, as individuals with HIV who know they are positive are more likely to initiate HIV treatment and less likely to participate in high-risk sexual or drug use behaviors.[3] Although HIV testing rates are higher among Blacks and Hispanics compared to Whites, 17% of Blacks and 17% of Hispanics compared to 13% of Whites are unaware of their HIV status.[2] This suggests a continued need for improving HIV testing and prevention efforts among Black and Hispanic communities.[4]

Previous studies have described barriers to HIV testing.[38,51] The most commonly cited barriers to HIV testing that may influence racial and ethnic disparities in HIV include HIV exceptionalism or the fear of a HIV positive status being different from other diseases, lack of access to care, and misconceptions about HIV risk.[8 40,51,52] Research has also suggested that racial discrimination may be an important factor that influences decisions to engage in positive health behaviors as well as opportunities to receive health-promoting resources such as screening tests.[8,11,15,22] Racial discrimination acts as a system of differential treatment based on phenotypic race which structures opportunities and resources that influence health and health behaviors.[19] The discrimination literature has implicated racial discrimination as a fundamental determinant of racial and ethnic inequities in health,[19] Racial discrimination incites physiological stressors as a response to racialized experiences that increases negative coping behaviors that might put one at risk for HIV transmission while decreasing positive health behaviors such as HIV testing.[16] Previous literature has used various measures to capture racial discrimination, but

many of these measures do not capture whether or not an individual perceives these experiences as problematic. This study measures racial discrimination using the Reactions to Race module of the Behavioral Risk Factor Surveillance System (BRFSS) which captures an individual's experience of differential treatment based on race and whether or not an individual perceives that they experience a physical or emotional response to a racialized experience. Given the pervasiveness of discrimination in the United States,[19] it is possible that individuals who experience discrimination are primed for these negative encounters and thus they have no effect on the individual psychologically or physiologically.[53] Given this, we examined the relationship between racial discrimination and HIV testing behaviors using the Reactions to Race module, which measures an individuals' *response* to racial discrimination, rather than just an experience of racial discrimination alone. We also determined whether any relationship between Reactions to Race-based treatment and HIV testing is differential by Whites, Blacks, and Hispanic participants in the Behavioral Risk Surveillance Survey (BRFSS). We hypothesized that Whites, Blacks, and Hispanics who reported Reactions to Race-based treatment would have lower HIV testing prevalence and heterogeneity of effect between race and ethnicity and Reactions to Race-based treatment with respect to HIV testing will be present. Specifically, Blacks and Hispanic individuals who report Reactions to Race-based treatment will have a significantly lower HIV testing prevalence compared to Whites.

METHODS

Data Source

The BRFSS is a nationally representative, state-level, random-digit dialed telephone, multistage-cluster sampling survey administered by the Centers of Disease Control and Prevention (CDC). A detailed account of the study procedures, sampling and instruments have

been described elsewhere.[54] But, in brief, the survey collects data on non-institutionalized, adult (≥18 years) residents in the United States.[55] BRFSS includes three sections to ascertain information on health-related risk behaviors, chronic health conditions and use of preventive services: the core section, optional modules, and additional questions from each state. We used the 2012 survey, when the Reactions to Race module was administered as an optional module to capture the experience of differential treatment based on race in a population-based sample of Arizona and Wyoming.

Sample Population

The sample population included non-Hispanic Whites (n=11,007), non-Hispanic Blacks (n=146), and Hispanics (n=1388) aged ≥ 18 years who responded to at least one of the questions in the Reactions to Race module. In 2012, 13,579 participants aged ≥18 in Arizona (n=7,306) and Wyoming (n=6,273) responded to the survey. Due to small sample sizes, participants who identified as Asian, Native Hawaiian or other Pacific Islander, American Indian or Alaska native, or some Other race or Multiracial were excluded from this analysis (n=600).

Outcome – HIV testing

HIV testing was assessed via self-report through a question on the BRFSS core questionnaire. Participants were asked, “Have you ever been tested for HIV?” Available responses were yes, no, don’t know, and refused. For this analysis, we only included those who reported yes or no.

Exposure – Reactions to Race

Six questions were administered on the Reactions to Race optional module to assess personal experiences of differential treatment based on race and the Reactions to Race-based treatment. We investigated four of the six measures. The questions and responses include:

1. *Race Consciousness*: “How often do you think about your race? Would you say never, once a year, once a month, once a week, once a day, once an hour, or constantly?”
2. *Healthcare treatment:* “Within the past 12 months when seeking health care, do you feel your experiences were worse than, the same as, or better than for people of other races?” Individuals who responded that they only encountered people of the same race and did not seek healthcare within the past 12 months were excluded from the entire analysis.
3. *Physical symptoms: “*Within the past 30 days, have you experienced any physical symptoms, for example, a headache, and upset stomach, tensing of your muscles or a pounding heart, as a result of how you were treated based on your race?” Possible response categories included yes, no, and don’t know/not sure.
4. *Emotional symptoms:* “Within the past 30 days, have you felt emotionally upset, for example angry, sad, or frustrated, as a result of how you were treated based on your race?” Possible response categories included yes, no, and don’t know/not sure.

We assessed the association between each of the four questions separately with the outcome (ever tested for HIV). Responses for race consciousness were recoded as always (constantly, once an hour, or once a day), sometimes (once a week or once a month), never (once a year or never) and don’t know. For the healthcare treatment responses, worse than other races/better than others was included in the worse than other races category. Emotional and physical symptoms due to race-based treatment were analyzed as collected. In addition to assessing each question independently, we also created a composite score of all experiences of race-based treatment and responses using all four questions based on previous studies in the literature.[21] The Reactions to Race composite score was categorized into three categories: 1) no experiences of reactions to race based treatment (respondents who never thought about race, experienced equal or better treatment at work & healthcare, and experienced no emotional nor physical symptoms); 2) one experience of reactions to race based treatment (respondents

who reported ≥1 of the following: thinking about their race sometime or always, experiencing worse healthcare or work treatment, even if the respondent felt treatment was better than some, or experiencing emotional or physical symptoms); and 3) ≥2 experiences of Reactions to Race based treatment (respondents reporting ≥2 affirmative responses to any of the five Reactions to Race based treatment measures: thinking about race, experienced worse healthcare treatment, experienced worse work treatment, suffered emotional symptoms or physical symptoms). Those who responded "don't know/not sure" to all Reactions to Race measures were categorized separately as "unknown number of experiences".

Potential confounders

Consistent with previous literature, the following characteristics were included in the analysis as potential confounders of the association between HIV testing behaviors and Reactions to Race measures: age, sex, marital status, education, income, employment, health insurance, and high risk behaviors.[10,22] Age was grouped into four categories: 18-39, 40-49, 50-64, and ≥ 65. Sex was analyzed as collected in the survey (male and female). Marital status was categorized as married/ member of unmarried couple, divorced/ separated/widowed, and single. Educational attainment was recoded as less than or equal to high school, high school or GED, and college or more. Income level was recoded as earning less than $35,000, $35,000-$75,000, and greater $75,000 per year. Employment status was classified as employed, unemployed, and retired. Health insurance was categorized as yes or no. HIV risk was assessed in the BRFSS by asking respondents if any of the following high risk situations apply to them: used intravenous drugs, treated for a sexually transmitted or venereal disease, given or received money or drugs in exchange for sex, or had anal sex without a condom in the past year. Respondents were not asked about each of these risk behaviors individually.

Effect modifier

Race/ethnicity was included in the analysis as a potential effect modifier in the relationship between Reactions to Race based treatment and HIV testing. Race/ethnicity was classified as mutually exclusive categories including non-Hispanic White, non-Hispanic Black, and Hispanic. For our analysis, all respondents who identified as White or Black (African-American) were Non-Hispanic. Respondents who identified as Hispanic could be of any race and were classified as Hispanic regardless.

Statistical Analysis

We assessed the bivariate association between Reaction to Race-based measures and HIV testing using chi-square analysis. For AIM I, descriptive characteristics including frequency percentages and standard errors[56] for categorical variables were calculated for the entire population. We then calculated the prevalence of HIV testing overall for selected characteristics and the Reactions to Race measures. In the bivariate analysis, we performed chi-square tests to assess the unadjusted relationship between select characteristics with HIV testing and the Reactions to Race composite score. For inclusion in the adjusted model, we considered statistically significant characteristics ($P< .05$) in addition to the characteristics that could be acting as confounders in the casual pathway between experiences of racial discrimination and HIV testing. For AIM II, descriptive statistics for selected characteristics were calculated, and the prevalence of HIV testing by race and ethnicity was calculated for selected characteristics. Multivariable logistic regression model was used to calculate the odds ratios and 95% confidence intervals between Reactions to Race measures and HIV testing behavior after adjusting for significant characteristics identified in the bivariate analysis. Interaction terms between each reaction to race-based treatment measure with race and ethnicity were assessed to determine heterogeneity of effect. The significance of the statistical interaction terms was assessed at an alpha level of 0.05. We stratified the adjusted relationship between Reactions to Race and HIV testing by race and ethnicity to show the effect of Reactions to Race on HIV

testing within each racial and ethnic group after adjusting for confounders. All analyses were performed using SAS 9.3. To account for the complex survey design, the analysis was weighted using procedures in SAS procedures PROC SURVEYLOGISITC, PROC SURVEYMEANS AND PROC SURVEYFREQ, which account for dependencies between observations.

RESULTS

Descriptive characteristics of all respondents of the Reactions to Race module are shown in Table II. Overall, most participants in the sample were over 65 (40%), female (59%), White (88%), married (58%), lived in Arizona (53%), had at least a high school education (35%), earned less than $35,000 per year (36%), were employed (45%), had health insurance (88%), and had no HIV risk (93%), and reported no experiences of Reactions to Race based-treatment (53%). About 21% reported ever being tested for HIV, and 18.9% of the population had one or more experiences of Reaction to Race based-treatment (Table 2).

Overall the prevalence of the Reactions to Race at least one experience of racial discrimination was higher among 18-39 (44%) compared to those over 65 (p=<.0001), those who were married (63%) compared to single (p=<.0001), those who had health insurance (88%) compared to the uninsured, and those who had no HIV risk (93%) compared to those with HIV risk (Table 2). The prevalence of HIV testing was significantly higher among participants age 18-39 (50%) compared to those aged 65 and older (p=<.0001), those with health insurance (78%) compared to those without insurance (p=0.132), those who were employed (60%) compared to those who were unemployed (p= <.0001), those with no HIV risk (92%) compared to those with HIV risk (p=<.0001) , and those with some college experience (37%) compared to those with college or more (p=0.038). (Table 3). There were no significant differences in HIV testing by participant gender, health insurance status, emotional or physical symptoms from

racialized experiences. Significantly more participants who received HIV testing had 1 or more experience of Reactions to Race based-treatment (p=0.004) compared to those who had

In the adjusted analysis (Table 4), we used the Reactions to Race composite score to calculate the odds of seeking HIV testing for those who had 1 experience of race-based treatment and 2 or more experiences compared to those who had no experience. One experience of Reactions to Race based treatment was significantly related to HIV testing (OR=1.37; 95% CI: 1.08-1.75) and 2 or more experiences (OR=1.37; 95% CI: 0.90-2.08) was marginally related to HIV testing compared to those who had no experiences of Reactions to Race-based treatment. Respondents who were Black (OR=2.60; 95% CI: 1.44-4.68) compared to Whites, those who were divorced, separated, or widowed (OR=1.52; 95% CI: 1.17-2.0) compared to those who were married or a member of an unmarried couple, those with college or more education (OR=1.43; 95% CI: 1.09-1.88) compared to less than high school education, and those with HIV risk (OR=4.31; 95% CI: 2.33-7.97) compared to those with no HIV risk had an increased odds of HIV testing. Additionally, respondents who reported experiencing physical symptoms (OR=1.89; 95% CI: 1.12-3.21) compared to no physical symptoms or worse treatment in the healthcare setting (OR=2.09; 95% CI: 1.09-4.03) as a result of Reactions to Race based-treatment compared to the same treatment were significantly more likely to report HIV testing.

With respect to the race-stratified analysis (Table 6), the sample had a majority of Whites (88%) followed by Hispanics (11%) and Blacks (1%). The prevalence of HIV testing was higher among Blacks (61.5%) and Hispanics (33.3%) compared to Whites (31.6%) (P-value=<.0001; Table 5). The prevalence of 1 or more Reactions to Race based treatment among those tested for HIV was significantly higher among Blacks (56.2%) and Hispanics (62.6%) compared to Whites (32.5%). Significant differences in HIV testing by education level, marital status, health insurance, income, and HIV risk were seen by race and ethnicity.

Specifically, Hispanics (61%) who had a less than high school education had a higher prevalence of HIV testing compared to Whites (32%) and Blacks (34%). Compared to Whites (58%) and Hispanics (53%), Blacks (40%) who were married or a member of an unmarried couple had a lower prevalence of HIV testing. Among those who had health insurance, Whites (90%) had the highest prevalence of HIV testing compared to Blacks (81%) and Hispanics (71%). HIV testing prevalence was significantly lower among Whites (33%) who earned less than $35,000 per year compared to Blacks (51%) and Hispanics (55%) who earned less than $35,000. Furthermore, prevalence of HIV testing among Blacks (5%) who had HIV risk was higher compared to Whites (1%) and Hispanics (3%).

The results of the interaction term testing revealed that no interaction between race and Reactions to Race-based treatment measures was observed for HIV testing behavior. All analyses were repeated for each individual Reactions to Race-based treatment measures and the Reactions to Race composite score.

In the racially stratified adjusted analysis, Whites who had 1 experience of Reactions to Race based treatment (OR=1.37; CI: 1.07- 2.83) or 2 or more experiences (OR=1.74; CI: 1.06-1.78) of differential treatment were significantly more likely to seek HIV testing compared to those who had no experiences. Blacks who experienced Reaction to Race based treatment were significantly more likely to ever be tested for HIV for measures of Reactions to Race based-treatment except emotional symptoms compared to Blacks who did not experience the treatment (Table 6). Specifically, Blacks who had physical symptoms due to race-based treatment (OR=8.23; CI: 1.58-42.7) were more likely to seek HIV testing compared to those who had no experiences. Furthermore, Blacks who experienced worse treatment in the healthcare setting (OR=13.9; CI: 2.06-94.3) compared to those who had the same treatment in healthcare. Although insignificant Blacks who always thought about their race (OR=2.52; CI: 0.46-13.8) compared to Blacks who never thought about their race were more likely to be HIV tested. The

odds of HIV testing among Whites (OR=2.03; CI: 0.61-6.72) and Hispanics (OR=1.00; CI: 0.61-6.50) were not significantly different for Whites and Hispanics, respectively, who had worse treatment in the healthcare setting. Hispanics (OR=0.75 CI: 0.82-3.75) and Whites (OR=0.78 CI: 0.35-1.70) who had emotional symptoms due to race based-treatment were insignificantly less likely to be tested for HIV compared to Hispanics and Whites, respectively, who did not have emotional symptoms. White (OR=0.73; CI:0.35-1.54) and Hispanic (OR=0.76; CI 0.57-1.79) respondents who reported better treatment than other races in the healthcare setting were also insignificantly less likely to get tested for HIV compared to Whites and Hispanics, respectively, who had the same treatment. The odds of HIV testing among Blacks (OR=2.50; CI: 0.29-21.3) who had 2 or more experiences of Reactions to Race based treatment was not significantly higher compared to Blacks who did reported no experiences.

DISCUSSION

The results of this study revealed that experiences of Reactions to Race-based treatment was associated with increased rates of HIV testing across race and ethnic groups, and HIV testing behaviors was increased in Whites who experienced race-based treatment compared to Whites who had no experiences. We hypothesized that measures of Reactions to Race based treatment was negatively associated with HIV testing prevalence across the total population, however our findings did not support this hypothesis. The results indicated that respondents who had an experience of Reactions to Race based-treatment in healthcare, responded emotionally or physically to differential treatment, or constantly thought about their race had a higher HIV testing prevalence among the total population. For example, respondents who experienced worse treatment than other races in the healthcare setting were more likely to receive HIV testing compared to those who had the same or better treatment.

In a cross-sectional analysis of BRFSS, Hausmann and colleagues examined the association between perceived discrimination measured by the Reactions to Race measures and use of preventive health care services including receiving a flu shot, mammogram, Pap test, blood stool test, and sigmoidoscopy/colonoscopy.[57] In the adjusted model, the results revealed that utilization of preventive health care services was lower among those who had experiences of racial discrimination in health care. The findings of our study are inconsistent with Hausmann's findings in that that those who had experiences of racial discrimination were more likely to receive HIV testing.

Although a positive association between Reactions to Race based treatment and HIV testing appears counterintuitive and does not support theoretical frameworks, other studies have shown similar findings.[49,58] For example, Borrell and colleagues investigated the association between discrimination with smoking, alcohol consumption, and physical activity.[59] In a racially stratified analysis, Blacks who experienced moderate or high racial discrimination were more physically active than Blacks who reported no discrimination. A possible explanation could be that racial and ethnic minorities who respond to differential treatment based on race challenge the negative experience and engage in healthier outcomes and behaviors such as seeking HIV testing.[10] So it is possible that the stressors related to racial discrimination that result in emotional and/ or physical symptoms could serve as motivation to combat the differential treatment and in turn seek HIV testing. It is conceivable that Reactions to Race based treatment is protective of health protective. In the CARDIA study among young Blacks and Whites, Krieger and colleagues found that Blacks who notice racial discrimination in their social environment and challenge it could have healthier outcomes than those who do not engage; therefore perceived racial discrimination may not be inherently detrimental if responses to those experiences are proactive. [58]

The results of our stratified analysis suggests that there are not differences in experiences of Reactions to Race based treatment with respect to HIV testing within racial/ethnic groups. After adjustment for selected covariates, Blacks who had physical symptoms and had worse healthcare treatment had a higher HIV testing prevalence compared to Blacks who did not have physical symptoms and the same healthcare treatment, however these results had unstable odd ratios and 95% confidence intervals likely due to small sample sizes. Despite the unstable results, this finding is consistent with Ford et al. clinic-based study, which examined perceiving everyday racism and HIV testing behaviors among Blacks. The results revealed a higher odds of HIV testing among Blacks who perceived racism compared to those who did not experience race based treatment.[10]On the other hand, Blacks who always thought about their race were more likely to receive HIV testing, however this result was not statistically significant. On the other hand, Blacks and Hispanics who reported emotional symptoms due to differential treatment in healthcare were insignificantly less likely to receive HIV testing. This finding demonstrates the potential negative association between experiences of racial discrimination and HIV testing.

In another study, Lillie-Blanton and colleagues found that racial and ethnic groups often experience the healthcare system differently, and racial discrimination acts a barrier to accessing adequate healthcare services in these communities. Our results were not consistent with this study. We found the odds of testing for HIV among Blacks who experienced differential treatment in healthcare were significantly higher compared to those who did not experience differential treatment. Irvin and colleagues also examined the relationship between healthcare-specific racial discrimination and HIV testing among Black MSM, and found that over 80% of participants who reported healthcare-specific discrimination had been tested for HIV within the last year and healthcare-specific racial discrimination was positively associated with HIV testing [OR=1.6(1.1,2.4)]. Our study is consistent with the findings by Irvin and colleagues although

these studies operationalized racial discrimination differently. Irvin and colleagues operationalized healthcare specific racial discrimination as unfair treatment due to race for the participant, a friend, family member, or someone they knew, compared to our study, which assessed individual experiences of Reactions to Race based-treatment.

Measurement of racial discrimination is a critically important issue for the future of racial discrimination assessment.[18] There is great variability in how discrimination is assessed, yet no one measure has been identified as the standard measure. As demonstrated in Table I, the length, content, and language of the discrimination measures vary for each scale. Therefore, future research should systematically review existing methodologies used to measure discrimination to develop a more consistent measure to be used in discrimination literature. This measure(s) should comprehensively assess discrimination by identifying individual events and the accumulation of discriminatory events over a lifetime, while also capturing an individual's response to differential treatment, Development of a more consistent measure will add to the discrimination literature by providing a comprehensive measure to better understand of differential treatment can influence the health of various populations.

Furthermore, the results also revealed that Whites who had 2 or more experiences of Reactions to Race based treatment were significantly more likely to test for HIV compared to those who had no experience. It is possible that Whites do not consider notions of culture and history when thinking about their race; therefore they may associate being discriminated against with being a marginalized group. In turn, this notion may result in an over or underestimation in the number of experiences of racial discrimination. This finding suggests that reports of racial discrimination among Whites specifically need to be further examined. Among Whites, those who received better treatment than other races in the healthcare setting were less likely to seek HIV testing compared to those with the same treatment. This finding may be seen because respondents who are treated better do not believe they are at risk for HIV and in turn seeking

testing at lower rates. Hispanics who had emotional symptoms due to Reactions to Race based treatment were less likely to be tested for HIV compared to those who did not experience emotional symptoms. However, Hispanics who had a physical symptom due to Reactions to Race based treatment compared to those who did not were more likely to be tested. These findings suggest that physical and emotional responses to race-based treatment results in differences in HIV testing behaviors among Hispanics, and underscores the need for additional research on the manifestation of responses to stress.

The study has several limitations. First, due to the cross-sectional nature of the study, we are unable to establish temporality. Moreover, because we examine lifetime HIV testing, we are unable to establish temporality between HIV testing and any of the Reactions to Race measures. We attempted to assess past year HIV testing (Appendix I), but due to small sample sizes, we were unable to determine whether Reactions to Race based measures preceded HIV testing. Second, the self-report nature of the data could result in an overestimation of HIV testing and over or under-estimation of Reactions to Race based treatment. Third, the state-specific data was weighted to be nationally representative of the given states, it is not generalizable to all states in the US. Fourth, small sample sizes among the racial and ethnic minority groups presented a challenge for obtaining stable estimates in the adjusted analyses among Black and Hispanics.

Despite the limitations, our study had several strengths. Specifically, the sample population was large enough to include several potential confounders. To our knowledge, this is the first study to examine the relationship between race based treatment and HIV testing across races using the Reactions to Race module.

CONCLUSION

Our study revealed that Reaction to Race based treatment is associated with increased HIV testing. Further, the odds of HIV testing among those who experienced Reactions to Race based treatment differed by race and ethnicity. This positive relationships between Reactions to Race-based treatment and HIV testing is heightened among Black participants who have expereinced physical symptomscompared to those who did not have physical symptoms and Whites who had 1 or more experiences of Reactions to Racebased treatment compared to those who had no expereinces. Understanding whether HIV testing motivations vary by race and ethnicity is important for understanding differences in HIV. Given that Blacks counterintuitively were more likely to be tested if they experienced a racialized experience, we need to better understand the pathways that link discrimination with HIV testing by exploring whether discriminaiton results in proactive health responses. We must consider the potential postive association in which stress due to racial discrimination can infleucne an individual's health behaviors.To improve inequities in HIV among racial and ethnic minorities, more research is needed to understand the settings, populations, and outcomes in which Reactions to Race based treatment is detrimental versus protective.

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Table I. Measures of Racial Discrimination employed in previous literature		
Discrimination Survey Instrument Name (Author)	**Goal of survey instrument**	**Survey Items**
The Major and Everyday Discrimination Scale (Williams)	Two part scale that captures major experiences of unfair treatment as well as the chronic, routine and relatively minor experiences unfair treatment in everyday life	• Everyday experience of discrimination items: treated with less courtesy, treated with less respect, receiving poorer service, viewed as not smart, viewed as dishonest, viewed as less than, called names/insulted, and being threatened or harassed • Major experiences of discrimination: ever unfairly fired or denied promotion, ever unfairly not hired, ever unfairly treat by police, ever unfairly discouraged from continuing education, ever unfairly prevented from moving, unfairly denied bank loan, received inadequate services compared to others • A follow up question is asked to capture the main reason for the experiences (i.e. gender, race, age, ancestry, religion etc.)
Experiences of Discrimination(EOD) measure (Krieger)	Measures the frequency of having experienced discrimination based on race, ethnicity, or color and the individuals' response to the experiences	• Ever discriminated against: at school; getting a job; at work; getting a house; receiving medical care; interacting with police/courts; or in a public setting. • Response to unfair treatment: "accept as fact of life" or "try to do something about it"
Reactions to Race Module (BRFSS)	Measures individual experiences of racial discrimination, embodiment of the racial discrimination, and the individuals' reaction to race-based treatment	• How often does the individual think about their race; experiences of unfair treatment in the workplace and health care setting, and physical (e.g. headache, upset stomach, pounding heart) or emotional (e.g. angry, sad, frustrated) responses to unfair racial treatment
Perceived Racism Scale (McNeilly)	Multidimensional scale which measures the frequency of perceived experiences of racism among African-Americans and assesses the emotional and behavioral coping responses to racism	• 43 items on the frequency of exposure to racial discrimination on the job; academic settings; public settings; racist statements • 8 items on emotional responses (e.g. feeling angry, sad) and behavioral coping responses (e.g. speaking up, forgetting it, getting violent, praying) to perceived racism

Table 2. Prevalence of Reactions to Race composite score by sample characteristics and Reaction to Race measures, Behavioral Risk Factor Surveillance System, Arizona & Wyoming, 2012 [a] [b]

Participant Characteristics	Total n =12,541	%	No experience % (SE)	1 experience % (SE)	2 or more experiences % (SE)	Unknown experiences % (SE)	P-value
Age Group (years)							
18-39	2040	16.4	34 .3 (1.41)	44.4 (2.22)	46.0 (4.78)	65.3 (2.99)	<.0001
40-49	1393	11.2	15.7 (1.03)	18.0 (1.68)	21.7 (3.97)	12.7 (2.13)	
50-64	3968	32.0	27.5 (1.12)	23.5 (1.71)	25.7 (3.87)	14.7 (1.89)	
≥ 65	5013	40.4	22.53 (0.87)	14.0 (1.12)	6.6 (1.58)	7.32 (1.14)	
Sex							
Male	5104	40.7	44.2 (1.34)	54.4 (2.15)	50.3 (4.7)	56.0 (3.5)	0.0003
Female	7437	59.3	55.9 (1.35)	45.6 (2.15)	49.7 (4.7)	44.0 (3.5)	
Race							
White	11007	87.8	83.3 (1.28)	54.4 (2.23)	33.8 (3.9)	71.0 (3.6)	<.0001
Black	146	1.2	2.7 (0.63)	4.6 (0.95)	11.6 (3.3)	4.27 (2.00)	
Hispanic	1388	11.1	14.0 (1.19)	40.9 (2.3)	54.5 (4.6)	24.7 (3.43)	
Marital Status							
Married/ Member of unmarried cc	7108	57.6	62.5 (1.3)	54.7 (2.2)	52.2 (4.7)	45.8 (3.4)	<.0001
Divorced/ Separated/Widowed	3974	31.9	20.2 (0.9)	18.6 (1.5)	14.6 (2.4)	14.7 (2.0)	
Single	1312	10.5	17.3 (1.19)	26.7 (2.12)	33.2 (4.8)	39.5 (3.53)	
State							
Arizona	6584	52.5	87.6 (0.32)	95.0 (0.35)	96.8 (0.60)	94. 4 (0.72)	<.0001
Wyoming	5957	47.5	12.4 (0.32)	5.00 (0.35)	3.21 (0.60)	5.61 (0.72)	
Education Level							
≤ High School	4428	35.4	34.9 (1.34)	41.4 (2.2)	61.4 (4.37)	43.3 (3.63)	<.0001
Some College	3941	31.5	40.0 (1.35)	34.7 (2.13)	25.5 (3.87)	32.5 (3.15)	
≥ College	4131	33.1	25.1 (1.00)	24.0 (1.55)	13.1 (2.6)	24.2 (2.45)	
Health Insurance							
Yes	10967	87.7	86.5 (0.98)	78.5 (1.91)	61.8 (4.78)	78.7 (3.09)	<.0001
No	1537	12.3	13.5 (0.98)	21.5 (1.91)	38.2 (4.78)	21.2 (3.10)	
Employment Status							
Employed	5544	44.5	52.9 (1.35)	60.0 (2.14)	45.1 (4.60)	61.0 (3.40)	<.0001
Unemployed	2568	20.6	26.4 (1.32)	27.3 (2.06)	47.2 (4.73)	31.6 (3.40)	
Retired	4358	35.0	20.7 (0.84)	12.9 (1.11)	7.7 (2.3)	7.41 (1.20)	
Income							
Less than $35,000	4523	36.1	31.3 (1.25)	42.6 (2.19)	57.2 (4.64)	48.3 (3.53)	<.0001
$35,00- $75,000	3415	27.2	27.8 (1.16)	24.7 (1.75)	21.3 (3.79)	20.8 (2.42)	
Greater than $75,000	2791	22.3	28.6 (1.27)	23.3 (1.83)	6.8 (1.71)	19.8 (2.63)	
DK/Refused/Missing	1812	14.5	12.2 (0.89)	9.4 (1.37)	14.6 (3.72)	11.1 (2.32)	
HIV Risk[c]							
Yes	177	1.4	2.86 (0.47)	4.21 (0.94)	3.49 (1.58)	3.97 (1.37)	<.0001
No	11,673	93.3	97.1 (0.47)	95.8 (0.95)	96.5 (1.58)	87.4 (2.84)	
HIV testing							
Yes	2669	21.3	30.7 (1.28)	39.6 (2.15)	39.6 (4.56)	35.5 (3.80)	0.0031
No	8887	70.9	69.3 (1.28)	60.4 (2.15)	60.4 (4.56)	64.5 (3.38)	

[a] Percentages reported are weighted

[b] Participants who were missing HIV testing were excluded from analysis

[c] HIV Risk was assessed by measuring if the individual had engaged in any of the following behaviors that put them at risk for HIV transmission: used intravenous drugs; received treatment for a sexually transmitted disease in the past year; received money or drugs in exchange for sex in the past year, or had anal sex without a condom in the past year.

Table 3. Prevalence of HIV testing by sample characteristics and Reaction to Race measures, Behavioral Risk Factor Surveillance System, Arizona & Wyoming, 2012 [a b]

Participant Characteristics	Ever tested % (SE)	Never tested % (SE)	P-value
Age Group (years)			
18-39	49.74 (1.77)	33.36 (1.22)	<.0001
40-49	20.74 (1.40)	13.63 (0.86)	
50-64	23.14 (1.37)	26.20 (0.94)	
≥ 65	6.38 (0.61)	26.81 (0.81)	
Sex			
Male	51.27 (1.76)	47.76 (1.17)	0.099
Female	48.73 (1.76)	52.24 (1.17)	
Race			
White	66.08 (1.88)	71.29 (1.23)	<.0001
Black	7.67 (1.19)	2.40 (0.39)	
Hispanic	26.25 (1.78)	26.31 (1.23)	
Marital Status			
Married/ Member of unmarried coupl	52.45 (1.77)	59.28 (1.15)	0.0002
Divorced/ Separated/Widowed	20.10 (1.21)	20.48 (0.80)	
Single	27.45 (1.73)	20.24 (1.10)	
State			
Arizona	92.08 (0.37)	90.1 (0.22)	0.043
Wyoming	7.92 (0.37)	9.00 (0.22)	
Education Level			
≤ High School	37.80 (1.81)	42.48 (1.20)	0.038
Some College	36.73 (1.72)	35.46 (1.12)	
≥ College	25.48 (1.30)	22.06 (0.80)	
Health Insurance			
Yes	77.55 (1.62)	80.44 (1.06)	0.132
No	22.45 (1.62)	19.56 (1.06)	
Employment Status			
Employed	60.31 (1.75)	48.45 (1.17)	<.0001
Unemployed	32.18 (1.73)	27.69 (1.15)	
Retired	7.5 (0.69)	23.86 (0.77)	
Income			
Less than $35,000	41.27 (1.78)	37.8 (1.15)	<.0001
$35,00- $75,000	23.90 (1.45)	24.99 (0.93)	
Greater than $75,000	25.00 (0.93)	21.04 (0.95)	
DK/Refused/Missing	9.62 (1.04)	16.20 (0.92)	

Table 3. Prevalence of HIV testing by sample characteristics and Reaction to Race measures, Behavioral Risk Factor Surveillance System, Arizona & Wyoming continued, 2012 [a] [b]

Participant Characteristics	Ever tested % (SE)	Never tested % (SE)	P-value
HIV Risk			
Yes	6.91 (0.93)	1.43 (0.30)	<.0001
No	91.97 (1.06)	97.94 (0.37)	
DK/Refused/Missing	1.12 (0.55)	0.62 (0.22)	
Yes	7.93 (1.07)	6.03 (0.71)	
No	82.14 (1.41)	84.76 (0.93)	0.207
DK/Refused/Missing	9.93 (1.05)	9.21 (0.69)	
Yes	5.28 (0.94)	3.31 (0.45)	0.054
DK/Refused/Missing	10.61 (1.15)	9.39 (0.70)	
Health care treatment			
Worse	5.70 (0.93)	2.54 (0.40)	<.0001
Better	8.57 (0.91)	12.08 (0.70)	
DK/Refused/Missing	18.25 (1.35)	23.04 (0.970	
Race Consciousness			
Never	50.61 (1.77)	58.04 (1.18)	0.006
Sometimes	22.26 (1.44)	17.29 (0.96)	
Always	15.67 (1.52)	13.80 (0.96)	
DK/Refused/Missing	11.46 (1.12)	10.87 (0.72)	
Reactions to Race Composite Score			
No experiences	40.49 (1.70)	45.71 (1.15)	0.0004
1 experience	27.96 (1.63)	21.30 (1.03)	
≥2 experiences	7.74 (1.07)	5.88 (0.69)	
Unknown experiences	8.93 (1.01)	8.09 (0.66)	

Table 4. Unadjusted and adjusted odds ratio (95% CI) of the relationship between sample characteristics and Reaction to Race variables with HIV Testing, Behavioral Risk Factor Surveillance System, Arizona & Wyoming, 2012 [d e]

	HIV Testing			
	Unadjusted OR		Adjusted OR	
	OR	95% CI	OR	95% CI
Participant Characteristics				
Race Consciousness				
Never	1.00		1.00	
Sometimes	**1.45**	**(1.15-1.83)**	1.26	(0.99-1.62)
Always	1.31	(0.97-1.78)	1.26	(0.87-1.82)
Emotional Symptoms				
Yes	1.12	(0.73-1.75)	1.02	(0.64-1.623)
No	1.00		1.00	
Physical Symptoms				
Yes	**1.91**	**(1.17-3.12)**	**1.82**	**(1.08-3.06)**
No	1.00		1.00	
Healthcare Treatment				
Worse	**2.53**	**(1.34-4.79)**	**2.09**	**(1.08-4.03)**
Same	1.00		1.00	
Better	0.68	(0.52-0.89)	0.85	(0.63-1.15)
Reactions to Race Composite Score				
No experiences	1.00		1.00	
1 experience	**1.48**	**(1.20-1.83)**	**1.37**	**(1.08-1.75)**
≥ 2 experiences	**1.49**	**(1.00-2.20)**	1.37	(0.90-2.08)

[d]Analysis adjusted for age, race, marital status, state, income, and HIV risk

[e]Odds ratios reported in the table are weighted to reflect known proportions of age, race/ethnicity, gender, geographic region, and other known characteristics of the population

Table 5. Descriptive characteristics all respondents of Reactions to Race Module for selected characteristics by race/ ethnicity, Behavioral Risk Factor Surveillance System, Arizona & Wyoming, 2012

	Whites (n=11007)		Blacks (n=11007)		Hispanics (n=1388)		P-value
	n	%	n	%	n	%	
Participant Characteristics							
Age Group (years)							
18-39	1576	14.47	43	30.5	421	30.53	
40-49	1110	10.19	28	19.86	255	18.49	<.0001
50-64	3549	32.58	38	26.95	381	27.63	
≥ 65	4659	42.77	32	22.7	322	23.35	
Sex							
Male	4482	40.72	73	50	549	39.55	0.05
Female	6525	59.28	73	50	839	60.45	
Marital Status							
Married/ Member of unmarried coupl	6385	58.36	59	40.41	736	53.33	<.0001
Divorced/ Separated/Widowed	3528	32.25	52	35.62	394	28.55	
Single	1027	9.39	35	23.97	250	18.12	
State							
Arizona							
Wyoming	5320	48.33	125	85.62	1139	82.06	<.0001
	5687	51.67	21	14.38	249	17.94	
Education Level							
≤ High School	3529	32.15	51	35.42	848	61.45	<.0001
Some College	3558	32.42	47	32.64	336	24.35	
≥ College	3889	35.43	46	31.94	196	14.2	
Health Insurance							
Yes	9869	89.92	118	80.82	980	70.86	<.0001
No	1106	10.08	28	19.18	403	29.14	
Employment Status							
Employed	4808	43.9	76	52.41	660	48.07	<.0001
Unemployed	2058	18.79	39	26.9	471	34.3	
Retired	4086	37.31	30	20.69	242	17.63	
Income							
Less than $35,000	3684	33.47	74	50.68	765	55.12	
$35,00- $75,000	3116	28.31	34	23.29	265	19.09	<.0001
Greater than $75,000	2618	23.78	25	17.12	148	10.66	
DK/Refused/Missing	1589	14.44	13	8.9	210	15.13	

Table 5. Descriptive characteristics all respondents of Reactions to Race Module for selected characteristics by race/ ethnicity, Behavioral Risk Factor Surveillance System, Arizona & Wyoming, continued 2012

	Whites (n=11007)		Blacks (n=11007)		Hispanics (n=1388)		P-value
	n	%	n	%	n	%	
Participant Characteristics							
HIV Risk							
Yes	135	1.23	7	4.79	35	2.52	<.0001
No	10308	93.65	132	90.41	1233	88.83	
DK/Refused/Missing	564	5.12	7	4.79	120	8.65	
Emotional Symptoms							
Yes	243	2.21	20	13.7	135	9.73	<.0001
No	9784	88.89	110	75.34	1054	75.94	
DK/Refused/Missing	980	8.9	16	10.96	199	14.34	
Physical Symptoms							
Yes	150	1.36	8	5.48	95	6.84	<.0001
No	9886	89.92	119	81.51	1089	78.46	
DK/Refused/Missing	971	8.82	19	13.01	204	14.7	
Healthcare Treatment							
Worse	210	1.91	10	6.85	55	3.96	
Same	6846	62.2	88	60.27	840	60.52	<.0001
Better	1256	11.41	13	8.9	164	11.82	
DK/Refused/Missing	2695	24.48	36	23.97	329	23.7	
Race Consciousness							
Never	7917	71.93	50	34.25	509	36.67	
Sometimes	1470	13.36	74	16.44	241	17.36	<.0001
Always	405	3.68	125	34.93	398	28.67	
DK/Refused/Missing	1215	11.04	146	14.38	240	17.29	
Reactions to Race Composite Score							
No experiences	6161	70.42	37	31.9	395	34.05	
1 experience	1501	17.16	43	37.07	456	39.31	<.0001
≥2 experiences	210	2.4	21	18.1	128	11.03	
Unknown experiences	877	10.02	15	12.93	181	15.6	
HIV Testing							
Ever tested	2232	20.28	70	47.95	367	26.44	<.0001
Never tested	7935	72.09	65	44.52	887	63.9	
DK/Missing	840	7.63	11	7.53	134	9.65	

Table 6. Prevalence and odds ratio (95% Confidence Intervals) of HIV testing by sample characteristics and Reaction to Race measures by race/ethnicity, Behavioral Risk Factor Surveillance System, Arizona & Wyoming, 2012 [f g]

	Whites				Blacks				Hispanics			
Particpant characterisitcs	Ever tested %	Never tested %	OR	95% CI	Ever tested %	Never tested %	OR	95% CI	Ever tested %	Never tested %	OR	95% CI
Overall prevalence	31.64	68.36			61.52	38.48			33.25	66.75		
Emotional Symptoms												
Yes	4.64	2.48	0.78	(0.35-1.70)	18.04	15.84	0.99	(0.13-7.91)	13.29	14.77		
No	85.40	88.24	1.00		72.14	75.44	1.00		76.84	76.16	0.83	(0.40-1.72)
DK/Refused/Missing	9.96	9.27			9.83	8.71			9.87	9.07	1.00	
Physical Symptoms												
Yes	2.67	1.34	1.72	(0.77-3.84)	11.69	7.02	8.23	(1.58-42.7)	10.00	8.31	1.75	(0.82-3.75)
No	87.58	89.30	1.00		76.32	81.97	1.00		77.66	82.38	1.00	
DK/Refused/Missing	9.75	9.36			11.99	11.00			12.34	9.31		
Healthcare Treatment												
Worse	4.50	2.29	2.03	(0.61-6.72)	16.92	3.33	13.90	(2.06-94.3)	5.46	3.12	1.99	(0.61-6.50)
Same	68.95	62.23	1.00		55.14	55.62	1.00		67.36	63.27	1.00	
Better	8.89	11.93	0.73	(0.35-1.54)	9.58	13.37	2.27	(0.50-10.2)	7.48	12.37	0.76	(0.37-1.58)
DK/Refused/Missing	17.66	23.54			18.36	27.68			19.71	21.24		
Race Consciousness												
Never	59.76	69.07	1.00		34.21	37.40	1.00		32.35	30.02	1.00	
Sometimes	23.26	15.64	1.01	(0.55-1.84)	13.46	13.93	1.72	(0.14-21.4)	22.31	22.08	1.01	(0.55-1.86)
Always	5.82	4.49	1.01	(0.56-1.81)	39.04	41.97	2.52	(0.46-13.8)	33.63	36.47	1.01	(0.57-1.79)
DK/Refused/Missing	11.16	10.81			13.29	6.70			11.70	11.44		
Reactions to Race Composite Score												
No experiences	57.21	66.74	1.00		32.24	40.60	1.00		26.76	29.83	1.00	
1 experience	27.51	19.65	**1.37**	**(1.07-2.83)**	33.12	30.04	2.57	(0.36-18.3)	46.83	44.03	1.30	(0.76-2.21)
≥2 experiences	4.94	3.27	**1.74**	**(1.06-1.78)**	23.09	20.67	2.50	(0.29-21.3)	15.81	16.95	1.10	(0.52-2.30)
Unknown experiences	10.34	10.33			11.54	8.68			10.58	9.19		

[f]All analysis adjusted for age, and marital status. The model for Whites was additionally adjusted for sex, education level, health insurance, employment, HIV risk and income. The model for Blacks was additionally adjusted for employment status. The model for Hispanics was additionally adjusted for sex and HIV risk.

[g]Odds ratios reported in the table are weighted samples to reflect known proportions of age, race/ethnicity, gender, geographic region, and other known characteristics of the population

Appendix 1. Comparison of descriptive statistics of participants not tested in the past year and participants never tested for HIV, Behavioral Risk Factor Surveillance System, Arizona & Wyoming, 2012

	HIV Testing								
	Tested in the past year %	Not tested in past year %	P-value	Ever HIV testing %	Never tested for HIV %	P-value	Not tested in past year %	Never tested for HIV%	P-value
Participant Characteristics									
Age Group (years)									
18-39	73.81	46.03		52.76	33.36		46.03	33.36	
40-49	11.4	24.43	<.0001	21.27	13.63	<.0001	24.42	13.62	<.0001
50-64	11.25	24.19		21.05	26.2		24.19	26.2	
≥ 65	3.55	5.35		4.62	26.81		5.35	26.81	
Sex			0.038			0.078			0.496
Male	58.73	49.45		51.71	47.76		49.45	47.76	
Female	41.27	50.55		48.29	52.24		50.55	52.24	
Race									
White	61.48	66.47	0.328	65.25	71.29	<.0001	66.47	71.29	<.0001
Black	11.5	7.45		8.44	2.4		7.45	2.4	
Hispanic	57.02	26.09		26.31	26.21		26.09	26.31	
Marital Status									
Married/ Member of unmarried couple	37.21	55.93		51.4	59.28		55.93	59.28	
Divorced/ Separated	18.75	17.59	<.0001	17.86	12.4	<.0001	17.59	12.4	<.0001
Widowed	0.992	1.95		1.72	8.08		1.95	8.08	
Single	43.08	24.53		29.02	20.24		24.53	20.24	
State									
Arizona	93.53	91.51	0.072	92	91	0.077	91.51	91	0.42
Wyoming	6.47	8.49		8	9		8.49	9	
Education Level									
≤ High School	36.17	36.83	0.656	36.67	42.48	0.015	36.83	42.48	0.025
Some College	40.06	36.59		37.44	35.46		36.59	35.46	
≥ College	23.79	26.58		25.89	22.06		26.58	22.06	
Health Insurance									
Yes	74.92	78.31	0.407	77.49	80.43	0.142	78.31	80.44	0.336
No	25.08	21.69		22.51	19.56		21.69	19.56	

Appendix 1. Comparison of descriptive statistics of participants not tested in the past year and participants never tested for HIV, Behavioral Risk Factor Surveillance System, Arizona & Wyoming, 2012 continued

	HIV Testing								
	Tested in the past year %	Not tested in past year %	P-value	Ever HIV testing %	Never tested for HIV %	P-value	Not tested in past year %	Never tested for HIV%	P-value
Participant Characteristics									
Employment Status									
Employed	61.56	62.55	0.261	62.31	48.45	<.0001	62.55	48.45	<.0001
Unemployed	34.69	31.02		31.91	27.69		31.02	27.69	
Retired	3.75	6.44		5.78	23.5		6.44	23.86	
Income									
Less than $35,000	51.01	38.66	0.02	41.67	37.75	<.0001	38.66	37.75	<.0001
$35,00- $75,000	23.87	24.88		24.63	25		24.88	25	
Greater than $75,000	17.36	27.52		25.04	21.04		27.52	21.04	
DK/Refused/Missing	7.76	8.95		8.66	16.2		8.94	16.2	
HIV Risk									
Yes	12.24	5.72	0.088	7.3	1.44	<.0001	5.72	1.44	0.0002
No	86.4	93.47		91.74	97.94		93.47	97.94	
Emotional Symptoms									
Yes	9.26	6.9	0.144	7.47	6.03	0.367	6.9	6.03	0.218
No	77.05	84.08		82.37	82.37		84.08	84.76	
DK/Refused/Missing	13.69	9.02		10.16	9.21		9.02	9.2	
Physical Symptoms									
Yes	5.36	5.05	0.538	5.12	3.3	0.077	5.05	3.31	0.206
No	81.01	84.87		83.93	87.31		84.87	87.31	
DK/Refused/Missing	13.62	10.09		10.95	9.38		10.09	9.38	
Healthcare Treatment									
Worse	6.36	5.71	0.618	5.87	2.54	<.0001	5.71	2.54	<.0001
Same	64.02	69.37		68.07	62.35		69.37	62.37	
Better	9.97	7.66		8.22	12.08		7.66	12.08	
DK/Refused/Missing	19.65	17.25		17.84	23.04		17.25	23.04	

Appendix 1. Comparison of descriptive statistics of participants not tested in the past year and participants never tested for HIV, Behavioral Risk Factor Surveillance System, Arizona & Wyoming, 2012 continued

	HIV Testing								
	Tested in the past year %	Not tested in past year %	P-value	Ever HIV testing %	Never tested for HIV %	P-value	Not tested in past year %	Never tested for HIV%	P-value
Participant Characteristics									
Race Consciousness									
Never	13.56	15.49		15.02	13.8		15.49	13.8	
Sometimes	22.79	23.96	0.383	23.68	17.29	0.002	23.96	17.29	0.005
Always	48.556	50.53		50.05	58.04		50.53	58.04	
DK/Refused/Missing	15.09	10.02		11.25	10.87		10.02	10.87	
Reactions to Race Composite Score									
No experiences	45.04	47.37		46.81	56.44		47.37	56.44	
1 experience	32.68	34.23	0.677	33.85	26.3	0.002	34.23	26.3	0.007
≥2 experiences	8.79	8.76		8.76	7.27		8.76	7.27	
Unknown experiences	13.49	9.65		10.58	9.99		9.65	9.99	