Intersectional disparities in HIV testing among male youth in the U.S.

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Dissertation Abstract

Background: HIV testing remains a significant public health problem, particularly for adolescents who are the fastest growing age group of those infected with HIV. Data on HIV testing among adolescents is more limited and has generally focused on behavioral risk factors associated with HIV risk. Although racial disparities in HIV acquisition and entry into care have been explored, less is known about how structural forces such as institutional racism work through social identities of race and class to influence HIV testing among male youth. In an effort to explain the underlying origins of health disparities in HIV testing, Intersectional Theory is used to ground this dissertation. This approach was chosen for its insight in understanding health disparities as products of myriad interactions between structural forces and the intersecting axes of multiple social identities.

Methods: Data for this dissertation come from two sources. Aim 1 relies on qualitative data from sixteen in-depth interviews among black male youth ages 18-24. Inductive content analysis was used to explore the connection between structural discrimination and individual identity. Aims 2 and 3 rely on the 2006-2010 National Survey of Family Growth to examine the relationship between race, SES and HIV testing among a nationally representative sample of 15-24-year-old sexually experienced black, white and Hispanic males. Logistic regression analyses were conducted to test whether intersectional disparities in HIV testing are present. Unitary and intersectional models to assess the race-SES relationship with HIV testing are compared. In Aim 3, past-year HIV testing is examined among a subset of male youth who have received STI services in the past year. Multivariate logistic regression models were also used in this analysis to assess
intersectional effects of race and SES among those who received STI services.

**Results:** Narratives from heterosexual black males in Baltimore highlight the influence of structural inequalities such as racism, poverty, social instability and incarceration on individual identity. Aims 2 and 3 expand the methodological approach to intersectional analyses. In Aim 2, data demonstrate a greater likelihood of HIV testing for black male youth compared to non-Hispanic whites in the additive model (AOR: 2.35, 95%CI: 1.55, 3.56), although no income effects were noted. In the intersectional model, however, Hispanic versus non-Hispanic differences emerged within income bracket. Race-stratified analyses revealed no within-race income effect but highlighted other socio-structural factors are inconsistently associated with HIV testing across racial groups. In Aim 3 no race effects emerged in the additive model, although when controlling for other possible confounders a lower likelihood of HIV testing for low-income youth was observed (AOR: 0.54, 95% CI: 0.31, 0.93). In the intersectional model, none of the race-income groups revealed any disparities in HIV testing, although older age was significantly associated with greater odds of past-year testing. Stratified analyses reveal that the income effects noted in the additive model were specific to black males in our sample (AOR: 0.29, 95% CI: 0.12, 0.68) with no income effects notes for non-Hispanic white or Hispanic males.

**Conclusions:** This dissertation reaffirms the value of adopting an intersectional approach to health disparities research. Qualitative findings emphasize the importance of assessing how structural inequalities manifest in an individual’s identity. As structural approaches to HIV risk reduction continue to gain traction, ongoing efforts will be maximized if they integrate social identity theory, intersectionality and the way in which
structural disparities influence microlevel behavior. Quantitative results underscore the importance of exploring disparities in HIV testing using intersectional methods, as additive models of disparities obscure sub-population-specific effects. By examining our research question though multiple models, we discovered that model specification is critical to understanding potential points of intervention.
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For my dad.
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You came upon me carving some kind of little figure out of wood and you said, “Why don’t you make something for me?”
I asked you what you wanted, and you said, “A box.”
“Whatever for?”
“To put things in.”
“What kind of things?”
“Whatever you have,” you said.

Well, here’s your box. Nearly everything I have is in it, and it is not full. Pain and excitement are in it, and feeling good or bad and evil thoughts and good thoughts— the pleasure of design and some despair and the indescribable joy of creation.
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And still the box is not full.

~John Steinbeck

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CHAPTER ONE:

INTRODUCTION
Despite public health gains in HIV prevention over the past several decades, youth remain the most at-risk age group for new HIV infections (1). In 2010, youth ages 13-24 accounted for more than one fourth of new HIV infections (2). Certain racial/ethnic minority groups are disproportionately affected, with 84% of new infections among 13-19 year olds occurring among blacks and Hispanics (3). Significant racial disparities also persist in undiagnosed HIV infections: in a 2010 analysis that used a back-calculation model from cumulative HIV incidence from the national HIV/AIDS reporting system, undiagnosed HIV was far greater among black and Hispanic populations compared to whites: while 18% of whites had undiagnosed HIV, 21.6% of Latinos and 22.2% of blacks had undiagnosed HIV (4). These data underscore the urgent need to understand and increase rates of testing among youth, and youth of color in particular.

Racial disparities in the HIV epidemic are a product of longstanding and contemporary structural influences (5-7). Poverty, mass incarceration, limited educational and employment opportunities as well as differential access to healthcare all reflect systems-level inequities that disproportionately affect people of color (8). In this way, racial identity can be considered a multifaceted individual-level measure of structural inequality. Approaches that attend to both individual as well as economic, social, political and environmental factors, elevate the importance of understanding how structural context operates on HIV risk through an individual’s social identities (i.e. race, gender, etc.) (9).
To date, factors associated with racial disparities in HIV testing remain understudied. To the extent they have been examined (10, 11), classification of minorities is often modeled as static, singular and homogenous. This approach often obscures within group heterogeneity as well as the range of disparities truly experienced by a marginalized population that occurs at the intersection of other identities such as gender, sexual orientation, or class. Intersectional theory, which guides this dissertation, provides promising insight into better understanding racial disparities that govern health behaviors such as HIV testing and innovates on prior research on HIV testing. In contrast to frameworks that have examined HIV testing along single axes of identity (i.e. race, gender, age alone), Intersectional Theory seeks to understand the how the interaction of multiple social identities influences health behavior and what they embody about structural inequity.

There is growing evidence that an individual’s perception of their social identities has critical linkages with health behavior (12-14) and, subsequent health disparities (15). Not only is social identity a complex manifestation of multiple social positions (i.e. gender, sexual orientation, class, race); it is also a reflection of broader social context within which people make decisions about their health (7, 16-18). Intersectional theorists position microlevel action within the broader ecosocial context – what an individual does is innately reflective of structural and social forces that oppress and empower specific social identities (17). Aim 1 of this dissertation illustrates this position by highlighting how narratives of individuals’ social identities reflect structural forces of oppression, building the case that racism is both deeply personal and experienced and the microlevel,
but also structural in nature.

Building off of this premise that microlevel identity can and does reflect structural inequality, Aims 2 and 3 utilize individual level measures of race and class to understand intersectional disparities in HIV testing. Racial and ethnic minorities constitute a diverse group not only across racial identities, but within them. In this burgeoning field, much remains unexplored with respect to disparities in HIV testing behavior among male youth. Differences in social structural context play out through individual behavior as well as access to HIV related prevention and treatment services. Research that identifies how multiple axes of social position foster differences in use of HIV testing services is greatly needed if we are to reduce disparities in the HIV epidemic.

Study Aims
The overarching goals of this dissertation are threefold: 1) to advance intersectional theory and methods in health disparities research; 2) to explore how structural oppression and institutional racism influence the social identities of young black men (Aim 1); and 3) to identify how the intersection of race and socioeconomic status affect HIV testing among sexually experienced male youth (Aims 2 and 3) so that we may begin to improve the rate and timeliness of HIV testing and subsequent entry into the HIV care continuum. Analyses include both qualitative and quantitative data. The former is drawn from a mixed-methods study in Baltimore. Quantitative analyses rely on data from the 2006-2010 National Survey of Family Growth, a nationally representative data source that oversampled youth, blacks and Hispanics. This dissertation has three aims.
Aim 1: To qualitatively explore how black male heterosexually experienced youth articulate race and gender identities and what their narratives imply about embodied structures of oppression.

Aim 2: To assess the association between race, SES and HIV testing history among a nationally representative sample of 15-24-year-old sexually experienced black, white and Hispanic males.

Sub-aim 2.1 To compare unitary and intersectional models that test the association between race, SES and HIV testing history.

Aim 3: To identify factors associated with past-year HIV testing among those who have received STI services in the past year using a nationally representative sample of 15-24-year-old sexually experienced black, white and Hispanic males.

Sub-aim 3.1 To compare unitary and intersectional models that test the association between race, SES and past-year HIV testing history among those who have received STI services in the past year.

Dissertation Overview

This dissertation includes seven chapters organized around three stand-alone manuscripts, each of which explores the relevance of intersectional theory and its value in better understanding patterns of HIV testing among male youth in the U.S.
Chapter 2 provides background on HIV among youth in the United States, the role of testing and context on the social disparities that texture this issue. The theoretical framework for this dissertation is also reviewed.

Chapter 3 includes a summary of the methodological framework that shapes the three manuscripts. In addition, the analytic approach and process for all three manuscripts, including data source, variables included in analyses, and steps used to ensure validity and reliability of findings is reviewed.

Chapter 4 (Manuscript 1), *Stories of self, stories of structure: Using narratives to understand how black male youth experience the intersections of race and gender*, summarizes the qualitative data from in-depth interviews with 16 heterosexually experienced black males ages 18-24 living in Baltimore City, MD. This paper explores how narratives of identity reflect structural inequalities and asserts the value of addressing the intertwined nature of structural oppression and microlevel action when considering how to best reach black male youth with HIV testing and treatment services.

Chapter 5 (Manuscript 2) quantitatively assesses the intersection of race and socioeconomic status with lifetime HIV testing among a nationally representative sample of 15-24-year-old sexually experienced males. Intersectional methods are evaluated by contrasting the prevailing unitary approach to modeling sociocultural position with a multiple approach that uses a combined measure of race and SES.
Chapter 6 (Manuscript 3) quantitatively assesses intersectional disparities in the dual receipt of STI and HIV services. In addition, factors associated with receiving an HIV test in the past year among this population of STI service users is explored. The same intersectional modeling approach used in Aim 2 is applied to this analysis, comparing data gained from an additive versus intersectional approach.

Chapter 7 summarizes the results from all three manuscripts along with the strengths and limitations of this dissertation. Policy and programmatic implications are also considered.

**Significance of this dissertation**

The application of an intersectional approach to understanding health disparities is still relatively novel in public health research (17, 19, 20), despite its ubiquity in other social science disciplines (17, 18, 21-23). The canon of work to date on intersectionality and its impact on young men’s health-seeking behavior is small but growing; however, it remains largely qualitative in nature (5, 6, 14, 24-31). None to date have explored HIV testing among youth using quantitative methods. Additionally, the evidence base on disparities in HIV testing among youth remains limited (32). Adolescents as a whole (33), or gender differences in HIV testing (34), for example, have been studied. HIV testing among minorities has generally focused on individual risk behavior or high-risk subpopulations (35, 36). Research that highlights the sociostructural disparities in HIV testing is growing (25, 37, 38); however, remains scarce among male youth, especially heterosexual male youth. The assessment of HIV testing as a product of intersectional dynamics between both structure and individual, as well as the intersecting identities of
race and class among youth innovates on prior work. By advancing intersectional research, this dissertation facilitates a more nuanced discussion of the context of health-seeking for youth and the actions needed by practitioners and policy makers to tailor strategies that will reduce undiagnosed HIV among youth of color in the United States.
Chapter 1 References


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CHAPTER TWO:

BACKGROUND
Background

**HIV’s evolving epidemiology**

Since the first cases of AIDS were identified more than 35 years ago in 1981, more than 1.8 million people in the U.S. have become infected with HIV – a number that steadily grows by about 50,000 annually (1). Since those first cases were identified, the epidemiology of HIV has changed dramatically, from the populations most affected, to the distribution of infection through various transmission categories, to geographic regions hardest hit. During the early phases of the epidemic, non-Hispanic white gay males were predominately affected.

Over time, racial and ethnic minorities have assumed a disproportionate burden of the disease, with the greatest burden of HIV occurring in the southeastern region of the U.S. (2-4). Among minority populations for whom surveillance data is collected, African Americans continue to experience the most severe burden of HIV, compared with other races and ethnicities: although they represent approximately 12% of the U.S. population, African Americans accounted for an estimated 44% of new HIV infections in 2010 (3, 5). Similarly, Hispanic/Latino men and women account for 16% of the population, but 21% of new HIV infections (3, 6). This shift in the populations most affected has placed a spotlight on the racial disparities in HIV.

Although men who have sex with men remain the group at greatest risk for HIV acquisition, with 63% of diagnosed HIV infection attributed to this population in 2012,
the proportion of men and women infected from high-risk heterosexual contact has risen dramatically from 10% between 1981-1995 to 30% by the mid 2000s (7). Recent estimates ascribe one in four new infections to high-risk heterosexual contact (3). Among those who become infected through heterosexual sex, racial and ethnic minorities are disproportionately affected. Among African American males, 65% of diagnosed HIV infections are attributed to heterosexual contact, compared to 19.2% for Hispanic males and 12.2% for white males (3). In a similar vein, women have steadily assumed a greater proportion of HIV infected individuals, with black and Hispanic women experiencing greater burdens of infection that non-Hispanic white women (4, 5, 8). In 2012, 17% of HIV diagnoses were attributed to heterosexual contact among females, with more that 65% occurring among black women (compared to 15% among Hispanic and 17% among white women) (1). Injection drug use (IDU), either on its own or combined with MSM behavior, is responsible for a much smaller percentage of HIV transmission: the CDC estimates that less than 10% of newly diagnosed HIV cases in 2012 were attributable to IDU (5).

Why Adolescents Remain a High Risk group

Today, youth are one of the fastest growing demographics of newly infected individuals (1, 6). The confluence of sexual and social risk-taking, which are hallmarks for this age group, predisposes this demographic to elevated risk of HIV infection. Sexual transmission is the most common means of HIV infection among adolescents (9) and is attributed to risky behaviors such as inconsistent condom use (10), sex with older partners (11), multiple sexual partners (12), partner concurrency (13, 14), and anal
intercourse (15). Data from the 2013 Youth Risk Behavior Surveillance System illustrates these risks: 40% of sexually active high school aged youth did not use a condom at last sex and 15% report four or more sexual partners (16). High-risk sexual behavior also often co-occurs within the context of chronic and casual substance use, both of which elevate the likelihood of unprotected sex (17, 18). These behaviors have also introduced youth to the highest rates of STI infections of any age group in the U.S. (19). The acquisition of an STI greatly increases a person’s chances of acquiring HIV, further underscoring the high stakes sexual environment in which many youth engage (20-22).

Similar to the adult population, HIV disproportionately affects low income and racial/ethnic minority youth (1). Trends in mode of transmission and ethnic/racial disparities among this age group mirror trends among adults. Among youth, men who have sex with men (MSM) have the highest risk of HIV infection, with MSM of color most affected (23). More broadly, the CDC estimates that more than half (57%) of new HIV infections among youth occur among African Americans followed by Hispanic/Latino (20%) and white (20%) youth (4). These trends, and the pronounced disparities experienced by racial/ethnic minorities – particularly sexual minorities within these groups – underscores the deficiency in current approaches to prevention and the need to prioritize HIV prevention and treatment efforts among black and Hispanic adolescents.
The “nexus of risk”: the socio-structural context of HIV acquisition (Aim 1)

Given persistent racial and socioeconomic disparities in HIV acquisition, more recent scholarship in this area has emphasized that individuals make decisions about their health within a broader social structural context (i.e. systemic forces of racism, classism, etc. that generate complex inequities for individuals and communities). Recent evidence suggests that environmental factors may exert equal if not greater influence on HIV risk behavior among youth (24). German and Latkin have coined this the “nexus of risk” (25, 26). Structural factors such as poverty (27-29), high rates of incarceration (28), as well as systemic and enduring disparities in education and access to health care (30) directly and indirectly affect access to and use of health services as well as individual level sexual risk behavior, particularly among communities of color (31-34). Emerging data highlights poverty’s critical role in the transmission of HIV among heterosexuals in urban areas. In a 2011 study of heterosexuals living in urban areas, the CDC found that compared to those above the poverty line, those living below the poverty line were two times as likely to have HIV (2). Among low-income communities, the racial and ethnic disparities in HIV acquisition are all but attenuated (2). Instead, limited educational attainment and unemployment status mark elevated risk among low income individuals (2).

Qualitative research affirms these findings among African American adolescent girls. In a 2006 study utilizing in-depth interviews, early adolescent African American girls revealed that their sexual risk taking was strongly influenced by community conditions (35). As Adimora and Auerbach write, “High incarceration rates disrupt sexual partnerships and stable families, impoverish individuals and communities, and alter the
ratio of men to women that, together, help drive sexual network patterns, and ultimately increase the vulnerability of communities and individuals to HIV infection” (32) p. S133). Furthermore, because minorities are more likely to be involved in the justice system at some point in their lives, they are also more likely to be exposed to HIV during imprisonment: prevalence in prison settings remains five to seven times greater than among the general population (36) Justice-involved youth are also less likely to report comprehensive HIV knowledge than youth who are in school, which exacerbates the likelihood of engaging in riskier sexual behavior within a riskier social environment (37). Similarly, youth who are homeless are more likely to experience sexual coercion and engage in substance use as well as risky sexual behavior such as transactional sex and early sexual debut (38, 39). Many homeless youth also identify as sexual minorities, which again highlights the interplay between various social identities and the contextual circumstances that shape sexual behavior and decision-making. To this end, an individual’s demographic markers such as race/ethnicity, sexual orientation and socioeconomic status, for example, are often used in health disparities research as proxies to assess how socio-structural context unevenly impacts individual-level behavior among marginalized populations (40-42). Despite a broader understanding of the structural drivers at play in the acquisition of HIV, research on the concomitant effects of multiple marginalized statuses remains scarce and has not extended into research on disparities in the use of HIV care services. Chapter 4 (Aim 1) responds to this gap by exploring what young black men’s narratives of racial and gender identities imply about embodied structures of oppression.

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**HIV testing as a critical HIV prevention strategy (Aims 2 & 3)**

The absence of symptoms for HIV infection makes routine testing an essential public health tool in HIV treatment and prevention. Early on in the epidemic, from the early 1990s until 2005, the CDC encouraged a risk-based testing strategy, which targeted high-risk populations such as MSM. This approach was in place for more than fifteen years. Over time it became evident that risk-based testing did not identify HIV positive people early on in their acquisition of the disease. Additionally, providers by and large failed to perform risk assessments with their clients; and when they did, there was an over-reliance of disclosure of risk, particularly given the highly stigmatized nature of the diagnosis (43). In addition to these shortcomings, the populations affected by HIV began to broaden to include a larger proportion of women and racial and ethnic minorities, signaling a more generalized epidemic. At the same time, non-targeted opt-out testing proved to be exceptionally effective among prenatal clients, virtually eliminating mother-to-child transmission in the U.S. (44). To this end, a non-targeted testing approach also proved to be very cost-effective in low prevalence settings, particularly given the advances in testing technology which permitted rapid testing.

Today, the CDC recommends routine opt-out HIV testing for all adolescents and adults ages 13-64, as well as pregnant women presenting for services in a healthcare settings (45). Annual testing is further recommended for those who report high-risk behaviors such as injection drug use, unprotected sex or a diagnosis of an STI or tuberculosis. In 2013 the U.S. Preventive Services Task Force (USPSTF) added weight to this recommendation by giving routine HIV testing of all adolescents and adults, ages 15 to
65, an “A” rating (46). This shift amplifies their prior position, which supported routine testing of high-risk individuals and pregnant women. In addition, the current A-rating endorsement of more universal testing has implications for reimbursement under the Affordable Care Act, which incentivizes service providers to offer A-rated services at no cost to clients.

Recent improvements in testing recommendations and in HIV care have made HIV testing the critical entry point into the HIV care continuum. Today, initiating antiretroviral therapy (ART) as soon as one is diagnosed with HIV can reduce AIDS-related mortality and extend life considerably (47). In the early stages of the HIV epidemic, when treatment options were less advanced, HIV testing did not present the opportunity for viral suppression and improved quality of life that it does today. Instead, testing was viewed as a death knell, an opportunity for greater stigmatization, and a risk to one’s employment and health insurance benefits (48). The mid 90’s heralded a shift in the HIV epidemic with the introduction of highly active antiretroviral therapy (HAART), yielding a 70% decline in HIV-related mortality between 1995 and 2005 (49). Today, with routine testing and early detection, early entry into and consistent engagement in care can mitigate viral loads and increase an HIV infected individual’s life expectancy similar to that of an HIV negative person (47, 50). Routine HIV testing has also been shown to lower overall healthcare costs (51).

Despite these advances, HIV testing still remains underutilized, particularly among youth, with an upwards of 60% of infected youth unaware of their status (44). Youth
remain underrepresented among ever testers. The most recent YRBS data highlight this missed opportunity with only 13% of 9th-12th graders reporting ever being tested (52). In contrast, 57% of adults between the ages of 25-44 report ever being tested (53). Although this difference may reflect a bias in the length of time adults have been sexually active compared to youth, other evidence also suggests that youth may be differently motivated than adults with regards to HIV testing. For example, there is consensus within the literature that youth consistently underestimate their risk for HIV (8).

Delayed and forgone testing for those infected with HIV comes at a considerable cost. Of those who do get tested, close to 40% go on to develop AIDS within one year, suggesting that many who get tested for HIV do so late into the progression of the disease (3, 44, 47, 50), long after the period when Antiretroviral Therapy (ART) is most effective (43). DiClemente notes that many of those who are diagnosed with HIV in adulthood likely contracted the disease during adolescence, underscoring the importance of increasing testing rates among youth (54). In addition to the individual benefit of timely testing and entry into care, others (43, 55) have pointed to the community-level benefits of an individual knowing his status: people who don't know their status contribute up to 50% of new HIV infections. Several studies report that HIV positive individuals who are aware of their status are more likely to modify risky sexual behavior such as frequency of unprotected sex with seronegative partners (56), and therefore less likely to transmit the disease to others (57).
Racial and socioeconomic disparities in testing

Racial or socioeconomic differences in HIV testing are not simply a neutral or natural phenomenon, nor are they subject strictly to individual preferences or behaviors— they partially reflect the legacy of racism and oppression that create systemic and structural barriers to receiving and seeking care for people of color. To the limited extent that disparities in HIV testing have been explored, the unitary descriptors of who gets tested and who doesn’t fail to clarify barriers and drivers of testing among people with multiple marginalized social identities such as low-income youth of color.

Data suggest that African American men and women are more likely than whites or Hispanics to get tested for HIV, although the drivers for this are not well understood (58-60). In fact, much of the literature points to factors that should theoretically produce lower odds of testing among minority populations. For example, Simmons et al. found racial differences in attitudes towards testing among a sample of people with advanced HIV and report that black females were significantly more likely than white or Hispanic females to underestimate their risk of HIV acquisition (61). Similarly, in a 2011 Kaiser Family Foundation report, African Americans who had never been tested for HIV report that low risk perception was their number one reason for not getting tested (8). Stigma and the loss of social capital have also been cited among African Americans as barriers to testing (62-64). Research on Hispanic/Latino populations demonstrates similar motivations for testing. In a 2010 study based on the National Health Interview Survey, more than two-thirds of Latinos who were surveyed had never been tested for HIV, and the vast majority (88%) expressed no intention to get tested (65). High-risk behavior and
perceptions of being high-risk were associated with testing, though one in four with those characteristics had never been tested, suggesting that overall testing among Latinos is suboptimal.

Individual level factors such as risk perception, perceived stigma, or other individual level behaviors that may drive demand for or access to HIV testing play out within a broader structural context. Similar to the nexus of risk that textures the complex inequities experienced by communities of color in HIV acquisition, the structural context that informs the use of HIV testing services is rooted in historic and contemporary forces of racism and systemic barriers to and biases in healthcare services (30).

Structural barriers such as cost, location, and accessibility to healthcare services are key impediments to care that routinely affect racial/ethnic minorities and low-income populations (57, 66). Those without routine exposure to healthcare system are often missed in routine HIV testing and having a regular source of care can be one of the strongest predictors of HIV testing among racial and ethnic minorities (43, 67). Because healthcare access can be limited for people of color, place of care can also influence who gets tested and where: studies find that white and black women are more likely to be tested at a private physician’s office or HMO location whereas Hispanic women are more likely to be tested at a clinic (66). While data are less specific for youth, evidence shows that minority youth are less likely to have access to and receive preventive health care than non-Hispanic white youth (68).
Differences in point of care service provision are part of broader racial and socioeconomic disparities in access to services. In a larger community-based sample, Holmes et al. notes that although African Americans are more likely to report voluntary testing compared to whites or Hispanics, they were less likely to receive an HIV test in relation to routine health care (59). Similarly, a 2007 survey of racial disparities in HIV testing suggests that although African Americans are more likely to get tested than Hispanics or whites, close to 70% of black men and women surveyed in a recent study report never being offered a test by a provider (69). These findings suggest systems-level biases in the provision of routine recommended care that are reflective of longstanding and contemporary racism. What’s missing from this story, however, is whether people of color who also live at the intersection of other marginalized statuses, such as socioeconomic status, sexual orientation or gender identity, experience even more pronounced disparities in the use of HIV services.

The role of socioeconomic status in HIV testing has been less well explored, though research on the correlation between SES and the use of other preventive health services suggests it is a critical factor in HIV testing that may also provide a more pointed description of racial disparities in HIV care (30, 41, 70). Based upon data from the 2011 Youth Risk Behavior Surveillance System, female youth who identify as African American are more likely to access HIV testing services than African American males (71). When income is accounted for (using free lunch as a proxy for low-income), this relationship flips, with black male youth more likely to get tested than their female counterparts (72). Similarly, Robinson et al. presents one of the few analyses that
examine within and across group racial differences in HIV testing among high-risk individuals over the age of 18. Their findings highlight differences found at the intersections of sociodemographic factors such as education, age and income, illustrating the heterogeneity within groups that is often masked in racial disparities research (66). Although these studies signal the value of understanding disparities in HIV testing at the intersection of multiple social identities, the topic remains understudied to date. Given the significant overlap between poverty and communities of color, this omission may obscure critical within-group details that are required to understand disparities in HIV testing among youth. Chapter 5 (Aim 2) of this dissertation adopts an intersectional approach to assessing racial disparities in lifetime report of HIV testing to better understand the pronounced disparities in HIV care engagement experienced by male youth of color in the U.S.

Integration of STI and HIV services (Aim 3)

The vertical integration of HIV and STI services provides clients access to comprehensive counseling, testing and treatment for both HIV and STIs in a single location and/or visit. The integration of HIV testing with STI testing and treatment is well endorsed by the Centers for Disease Control and Prevention (73) and is a key strategy in the 2015 the National HIV/AIDS Strategy for the United States. The movement towards integrating these services is predicated on the logic that demand for STI services co-occurs with HIV risk (74). Risk behavior, such as injecting drugs or having unprotected sex, places an individual at risk for multiple infections (20, 75). Furthermore, the biological synergy between HIV and STIs accentuates the need to proactively test clients who receive services for one or the other. Considerable evidence supports the association
between STIs and the acquisition and transmission of HIV through increased susceptibility and infectiousness (76). Certain types of STIs such as syphilis, herpes or chancroid produce genital ulcers which can facilitate easier entry of HIV; and general inflammation from either ulcerative or non-ulcerative STIs (e.g., chlamydia, gonorrhea, and trichomoniasis) encourages the increased production of CD4 cells in genital secretions which HIV targets. HIV-infected persons with STIs are also at greater risk of spreading HIV to others through increased cellular shedding of the HIV virus in genital secretions (76, 77). Other findings suggest that these biological mechanisms increase the risk of HIV infection by anywhere between 2 to 23 times, among those with co-occurring STIs (22, 78). In the same vein, effective treatment and syndromic management of STIs can reduce the risk of HIV transmission by as much as 38% (74, 79). Given their behavioral and biological overlap, the CDC recommends that HIV testing always be offered to individuals seeking STI testing and treatment services (80, 81).

In 2016 it is well understood that there is an innate compatibility between HIV and STI treatment and prevention services; however, this was not always the case. Today we readily acknowledge that STI and HIV services target very similar populations, respond to the same mechanism of transmission, and experience very similar challenges and innovations in treatment and testing options. To understand the contemporary dynamics of STI and HIV service integration, and why there may be lags and social disparities in these services, it is important to understand that these two areas were siloed for decades. The compartmentalization of these services is rooted in the way in which the epidemiology of STIs and HIV were investigated and understood; and the subsequent
clinical and programmatic responses to their treatment and prevention. STI treatment and prevention services gained a clinical and political foothold in the early 20th century when the prevalence of syphilis infection hindered recruitment in the U.S. armed forces (74). To combat rising rates of syphilis, the “screen and treat” medical model was adopted broadly. This approach remained the bedrock of STI response and relies on a clinically focused approach to care.

In contrast, HIV testing and prevention began with a predominately psychosocial response focused on primary prevention (21, 74). Early on in the epidemiologic awareness of HIV, when its means of transmission was less well understood, HIV was not intuitively aligned with STI detection and treatment. Additionally, in the early stages of the HIV epidemic, there was no way to test for the disease or its antibodies. When testing became available, there were no treatment options, so focus remained on primary prevention vis-a-vis behavior modification and education campaigns, both of which were often conducted in community-based settings as opposed to clinical settings. As the epidemiology of HIV became better understood (and acknowledged as both a blood borne pathogen and a sexually transmitted infection), early funding and technical expertise was often diverted from STI programs (74). By the mid 90’s the CDC had aligned TB, HIV and STIs under one umbrella, though their funding remained siloed (21). As HIV testing efforts increased, funding and efforts remained siloed from STI treatment and testing, and there was little if any cross referral services until 1998 when ASTHO issued “The Integration of HIV/AIDS, STD, and TB Prevention and Control
Programs” report (82). By the early 2000s it became evident that the lack of integration between HIV and STI services was a critical barrier to effective programming (83).

Mounting evidence continues to support the value of integrating STI and HIV testing. In a study on the integration of Hepatitis C and HIV services in Massachusetts correctional facilities, the authors found that the integration of services uncovered high rates of Hepatitis C that would have otherwise gone undetected (84). Similarly, in the integration of other synergistic infectious disease testing programs, Stout et al. report that integrated TB and HIV testing services in North Carolina helped reengage HIV positive clients in care and treatment (85).

Research on the integration of services remains extremely limited; however, extant data suggests that the degree of successful integration varies significantly based on the clinical context (86). Fitz-Harris et al. examined the level of program integration among CDC-funded HIV service programs across the United States. Using data from 2009 annual grantee reports, the authors found that 97% of grant recipients reported integrated STI and HIV testing services, suggesting that in publically funded clinics, integration of these services is strong. In contrast, Klein et al. examined provider rates of concurrent testing for STIs and HIV in an emergency department and found that only 28.3% of patients tested for syphilis, 3.8% tested for gonorrhea, and 3.8% tested for chlamydia were also tested for HIV during an ED visit, suggesting that despite gains in service integration initiatives, lags in integration across other care settings still exist (87). Beyond these descriptive studies, very little is known about the integration of STI and HIV testing, or
the degree to which racial and socioeconomic disparities may exist in the concomitant delivery of HIV and STI services. In review of the literature, no papers were identified that addressed potential racial disparities in HIV and STI service integration. Because it is well-endorsed that prevention and treatment of these multiple infections should be addressed during the same visit, and because racial disparities in STI and HIV acquisition and engagement in care are well acknowledged, the lack of research on this issue remains a significant gap in our understanding of how to attenuate disparities in HIV care and treatment.

**Racial disparities in the use of STI services**

Population-level data confirm racial disparities in positive cases of STIs which points to disparities in STI acquisition and elevated rates of need to use STI services among racial/ethnic minorities. It is important to note, however, that population-level data on the use of STI testing and treatment services is biased by reporting requirements, so what is known about STI service use at the population level comes only from positive cases of STIs, not from the total number of people who have sought testing. To this end, private clinics are less consistent in reporting positive STI cases than publicly funded clinics (88); therefore, data on STI rates may be inflated for those who use publicly funded clinics; and because racial and ethnic minorities are more likely to use publicly funded clinics, data may overestimate racial disparities in STI incidence (88).

Because there is a dearth of evidence on potential disparities in the dual receipt of STI and HIV services, we turned to the broader literature on racial disparities in health service utilization and anchored our examination to racial disparities in STI testing where
possible. Racial and socioeconomic disparities in the use of other health services have been described as individual level characteristics with structural roots (89). Most central to these drivers is the longstanding racism and oppression that people of color have experienced, which have cascaded into other systems and microlevel factors that influence the use of health services in communities of color. Poverty (30), lack of a regular source of care and health insurance (90), inadequate and unsafe housing, distrust of the medical establishment (89), even the risk environment that disproportionately elevates STI acquisition and therefore the need for STI services (31, 32) have all been linked to how racial and ethnic minorities engage in health care. It does not take a significant leap of imagination to assume that these forces may also be at work in the use of STI and HIV services.

These factors also emerge in the literature as barriers to using STI services (33, 57, 89, 91-93). What’s missing, however, in much of the literature on STI services is an explicit connection between racial identity and socioeconomic status and barriers to service utilization. For example, although Geisler et al. noted that having health insurance was associated with a lower risk of chlamydia among sexually active young adults, racial and socioeconomic disparities are not examined (94). In a case-control study among black MSM in Jackson, MI, Dorell et al. examined factors associated with missed STI testing opportunities and found that lack of health insurance, lack of provider recommendation for testing and the absence of a usual source of care all influenced missed opportunities for testing (95). While more instructive, Dorell’s paper does not examine the potential of
socioeconomic status to exert within-race effects on STI testing, nor does it compare across-race differences in factors associated with forgone testing.

Place of care has also been found to influence STI testing practices and racial and socioeconomic disparities in where individuals seek other healthcare services has been noted throughout the literature, with people of color and low-income individuals reporting use of public clinics, emergency rooms and acute care settings more often than higher income and white individuals (30, 55, 59, 67, 87, 89, 96). What remains unclear, however, is whether multiple social identities of marginalization confer greater disparities in the use of these services. Aim 3 (Chapter 6) of this dissertation attempts to resolve this gap in knowledge by examining racial and socioeconomic disparities in past-year HIV testing among male youth who have used STI services in the same year.

**Theoretical approach**

In an effort to explore disparities in HIV testing among sexually experienced adolescent males, Social Identity Theory and Intersectional Theory are used to ground this study.

*Social identity theory: connecting social structural context with individual health behavior*

HIV prevention efforts have largely focused on altering individual-level behaviors, particularly among high-transmission groups such as IDUs and men who have sex with men (1). As a consequence, the theoretical framing of HIV prevention has been similarly limited to theories that focus predominately on individual level behavior change, such as the Health Belief Model and the Theory of Reasoned Action (97, 98). Given the robust
evidence base regarding the multiple layers of risk in the social structural context, more recent scholarship has drawn attention to the importance of understanding how context operates on HIV risk behavior through social identity (99). This approach draws upon an ecological framing as well as Social Identity Theory to convey that an individual’s perception of himself and his position within his environment is tantamount to understanding how to mitigate HIV risk at both the individual and population level (55, 100-104). Embedded within this approach is the belief that the self is comprised of a multitude of identities, all of which are informed by sociocultural context. As individuals incorporate broader messages and structural influences about race, gender or class into their social identity, they develop a road map for their individual behavior.

Research across a variety of disciplines has demonstrated critical linkages with identity development and health behavior (105-107) and subsequent health disparities (108). Low-risk sexual behavior, high educational achievement and elevated self-esteem have all been linked to positive racial identity (109-111). In a community based study among black heterosexually identified men, positive attitudes towards racial group membership were associated with fewer sexual partners and a lower likelihood of sexually concurrency (112). Conversely, other studies have found that negative associations with racial group membership are connected with elevated sexual risk behavior such as partner concurrency (113, 114). In Chapter Four (Aim 1) I advance this work further by exploring how structural oppression and racism operate through the gendered and racial identities of urban black, heterosexually experienced male youth.
Social identity theory is insufficient in and of itself in explaining potential disparities in HIV testing among adolescent males. Because individuals possess many interlocking social identities (i.e. race, gender, class, sexuality) that simultaneously confer both privilege and oppression, Intersectional Theory is also used to guide this dissertation.

**Intersectionality**

Originating from feminist theory and the fundamental criticism of treating all women as a homogenous group, Intersectionality has evolved into a theoretical research paradigm that seeks to understand the interaction of social identities and what they embody about societal power hierarchies. Emerging from black feminist theory in the late 1980’s, Kimberly Crenshaw coined the term “intersectionality” in her 1989 publication “Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics” (102). Crenshaw exposes the marginalization minority women experience in legal settings, politics, as well as feminist theory due to the homogeny ascribed to minority groups. Crenshaw posited that an individual’s lived experience occurs at the intersection of myriad social identities, and failure to examine the conjoint salience of these sociocultural spaces not only ‘theoretically erases’ some of the most disenfranchised groups, but fails to fully account for the multiple, simultaneous oppressions they face. A person’s identity, she and others have argued, cannot be disentangled, and should therefore be evaluated as intertwined phenomena.
Intersectional Theory maintains that we cannot accurately understand health-seeking behavior by pursuing information gleaned from individual axes such as race or income or gender alone (100). It assumes that the identities individuals embody cannot be dissected; and that the combined effect of these identities yield significantly different effects than these social positions do on their own (104, 115). This approach recognizes that individuals bear identities that confer privilege alongside with identities that confer oppression. While black males may enjoy the privilege of their gender, they simultaneously experience the oppression of racism.

In contrast to the bulk of health disparities literature which either handles social categories separately or at best in an additive manner, intersectional analyses attend to the ways in which social identities interact and either amplify or stem the disparities observed in their silos. I apply an intersectional lens to the evaluation of racial disparities in HIV testing to advance the body of research on the ways in which we analytically articulate the association between and within traditionally static categories of identity. Oftentimes, race is considered antecedent to socioeconomic status. An intersectional approach acknowledges that these markers of social position are not experienced in isolation, additively or sequentially, but are instead interlocking and embedded within a broader social context. Research on HIV testing patterns at the intersection of multiple marginalized statuses is in its infancy. The extant research that attends to this, however suggests that racial differences in testing are sensitive to intersecting social locations such as gender and income. By adopting an intersectional lens to examine disparities in HIV testing among youth, this dissertation is a critical departure from prior research on a topic
that remains understudied despite its essential role as the first step in the HIV care continuum.
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CHAPTER THREE:

METHODS
Methods

Integration of theory with methods

To date, factors associated with racial disparities in HIV testing among youth have gone largely unexplored. To the extent they have been examined (1, 2), the dominant models used to explain testing behavior do not fully account for the simultaneous experience of multiple social identities. Intersectional methods provide promising insight into better understanding racial disparities that govern HIV testing by acknowledging the multidimensional nature of sociocultural location. This dissertation research posits that multiple marginalized statuses significantly predict adolescent health behavior when it comes to HIV testing. Given the paucity of intersectional analyses in quantitative studies in public health, this dissertation relies on both quantitative and qualitative analyses.

Intersectionality-informed research

Intersectional analyses most often rely on qualitative research. For example, through in-depth interviews Bowleg (2013) explores the interdependence of race, gender and class among heterosexual black men as well as the structural influences of racism, incarceration and employment that manifest in individual social identities (3). Bowleg’s work shines a light on the simultaneous interactions of multiple social identities that strongly influence minority health, particularly within the frame of HIV. Chapter Four applies qualitative methods to explore how narratives of race and gender reflect structural intersections of power and oppression. The methods used are consistent with the majority of intersectional analyses across disciplines (4-9).
Inadequate modeling and the case for intersectional quantitative analyses

A number of scholars have made the case for intersectional approaches to quantitative research (10-12), in an attempt to resolve the myopic approach used in single axes health disparities studies (i.e. analyses that centralize a single social identity such as race or gender, for example) (13). Intersectional researchers argue that additive approaches used to measure gender, race, and class as the sum of independent effects are inadequate in describing and resolving the interplay among multiple social identities that influence health outcomes (7-9, 14, 15). Recent investments in quantitative approaches to intersectionality have provided a springboard from which to explore questions that more explicitly link health seeking behavior and multiple aspects of social identity, though there remains a lack of consensus and consistency in how to best approach intersectionality in quantitative analyses (4, 11, 16, 17).

Most intersectional quantitative approaches apply McCall’s framework for intercategorical complexity through the use of hierarchical, multilevel or ecological modeling (10). As McCall writes, “intercategorical complexity requires that scholars provisionally adopt existing analytical categories to document relationships of inequality among social groups and changing configurations of inequality along multiple and conflicting dimensions.” (10) That is, the primary focus is on the intersection between different identity categories, such as the way in which one’s vulnerability to discrimination is a product of one’s intersectional identity as black, male, and poor. This approach is not only compatible with quantitative methods of modeling health disparities, it also lends itself to the use of existing survey data that has generally been developed without an
intersectional lens (18). Illustrative of this approach, Veenstra (2011) compared multiplicative and additive models of race, and gender in self-reported health among South Asian and white Canadians. In the additive model, he found that South Asian Canadians were more likely to report poorer self-reported health, while women and men were no more or less likely to report poor health. However, when examining these relationships through a multiplicative model, Veenstra found that South Asian women were more inclined to report poor health, but South Asian men were not, suggesting that the effects of race on health were different for men and women and that the effect of gender on self-reported health was conditioned on race (19).

The methods used in the quantitative aims of this dissertation (Chapters Five and Six) advance this discourse further by adopting McCall’s framework of intercategorical complexity (10) and applying Veenstra’s methods of contrasting additive and multiplicative models to test for simultaneity and directionality (19). Simultaneity reflects the assumption that both markers of social power, race and SES, will be significantly associated with past-year HIV testing independently and after controlling for one another. Directionality suggests that minorities and low SES youth (those who experience greater barriers to care and who have theoretically less power) will exhibit lower likelihood of receiving an HIV test. Figures 3.1 and 3.2 display the application of the intersectional theory with variables used to model HIV testing in Aims 2 and 3.

**Qualitative methods (Chapter 4)**

Data for manuscript one (Chapter 4) draws upon data collected for a larger longitudinal mixed methods study of the intersections of race, SES, gender identity and sexual risk
behavior among youth in Baltimore, MD. The qualitative component of the larger study focused on collecting narratives around race, class, gender and partner selection among sexually active African American adolescents, ages 18-24, in Baltimore, MD.

Field Guide Development
The Principal Investigator and one research assistant initially drafted the field guides. Questions were split between two interviews to develop rapport with participants (20). The first interview focused on narratives of how participants grew up, where they grew up, gender messaging from parents or caregivers, gender ideals, class and role models. This battery of questions was intended to elicit narratives of gendered messages heard while growing up, experiences of gender norms through familial expectations, current gender beliefs and perceptions of class. The role model section was included because of its previously endorsed value in understanding gender role beliefs among youth (20). The second field guide delved into perceptions of the self in relation to gender and race, relationship history, sexual activity and future goals (See Appendix for field guides).

Fieldwork
Fieldwork began with several weeks of participant observation in prospective recruitment venues. Two research assistants documented potential recruitment sites in memos detailing the volume of youth in various area, as well as time of day when venues were busiest (See Appendix for Observation Form). Venues that provided the greatest volume of youth as well as opportunities for private conversation were selected. Recruitment and interviews were subsequently conducted in public venues such as the mall food court, university’s student center, or on a public bench near the location of recruitment.
Between June and December 2011, three research assistants purposively recruited 18-24-year-old African American youth from urban shopping malls as well as a public university located in Baltimore City. Potential participants were approached and informed about the study using the recruitment script (Appendix). If participants expressed interest, they were screened (Appendix) for study inclusion. Individuals were eligible to participate if they reported being in a heterosexual relationship (including vaginal, anal, and/or oral sex) for longer than 3 months in the past 3 years; and lived in Baltimore City. Written informed consent was collected from all eligible participants (Appendix).

During recruitment, youth were screened and placed in one of two main SES categories. Participants were considered to be middle SES if they had two of the three following characteristics: if the residence they spent the most time in growing up was owned, if they did not receive free lunch in school, and if their primary caregiver completed any college. If they had less than two characteristics they were considered low SES. Thirty-two males and females participated in the study, of which 16 were male and 16 were female. The results in Chapter 4 reflect the experiences of the 16 males in the study. The average age of male participants was 19 years old. Forty-three percent had a caregiver with no college education and 69% received free school lunch as a child.

To cultivate rapport with participants and create more depth of understanding, the interviewers conducted two semi-structured, in-depth interviews per participant (See
Appendix). Each interview lasted between 40 and 90 minutes. Participants were compensated $25 for the first interview and $35 for the second interview in the form of a prepaid gift card. To facilitate the follow-up email Research Assistants collected participants’ cell phone numbers and scheduled within one to two weeks of the first interview. The second interviews were conducted in public spaces, and often in the same location where the first interview was conducted. Fifteen of the sixteen male participants completed both interviews. All interviews were audio tape-recorded and transcribed verbatim by an outside transcription company. Each transcript was then reviewed alongside the audio recording to ensure the accuracy of its transcription. The study was approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board.

Data Analysis

Data analysis was informed by both a deductive approach (21) in which themes were established a priori by the study’s research questions, the interview guides, and relevant theory, as well as through an inductive approach (22) in which themes were allowed to emerge from the data itself. The three study members who conducted the interviews also coded transcripts. Six interviews were used to develop the initial coding scheme, and were later coded independently. The three members of the research team then applied this coding scheme to four interviews to ensure consistency in its application. In points of disagreement, a fourth study member served as an arbiter throughout the entire coding process. All transcripts were coded using Atlas.ti version 7.0. The analytic process included memo-writing as well as frequent meetings with the study team to discuss emergent themes and how these themes varied by gender and SES.
Quantitative Methods (Chapters Five and Six)

Data Source: 2006-2010 National Survey of Family Growth

The second and third aims consist of secondary analyses of cross-sectional data from the 2006-2010 waves of the National Survey of Family Growth (NSFG). This data set was selected because it offers the opportunity to examine the intersection between race, income, HIV testing history, and use of STI services among a nationally representative sample of male youth.

The NSFG is a publically available nationally representative multistage probability sample designed to gather information on various fertility-related topics such as contraception, birth intervals, sexual activity and family formation. The 2006–2010 NSFG captures data from 22,682 face-to-face interviews in the U.S. household population aged 15–44 (12,279 with women and 10,403 with men). The 2006-2010 wave oversampled youth ages 15-19 as well as black and Hispanic adults. One person from each home was selected at random for data collection and interviews were administered in the home by a trained female interviewer using computer-assisted personal interviewing (CAPI) as well as audio computer-assisted self-interview (ACASI) for more sensitive items in the survey. The response rate for the 2006–2010 NSFG was 77% overall(80).

Study Sample: sexually experienced males ages 15-24

There were three inclusion criteria for these analyses. First, males who reported ever having sexual intercourse with either a male or female were included. Respondents who
answered yes to the following questions were considered sexually experienced and thus included in these analyses (n=8,738):

1. Have you ever had sexual intercourse?
2. Has another male ever put his penis in your rectum or butt (anal sex)?
3. Have you ever put your penis in his rectum or butt (anal sex)?

Second, because of the small sample sizes of other races and ethnicities, the sample was further narrowed to non-Hispanic black, non-Hispanic white and Hispanic males. Males who identified as a single race (white or black) or identified as Hispanic were included (n=7,993). Those who identified as multiracial or other ethnicities were excluded from this analysis (n=745). All those who were older than 24 were also excluded (n=5,574). The sample was finally narrowed to those who had explicitly stated “yes” or “no” for whether they had ever been tested for HIV. Respondents with unknown or refused were excluded from these analyses to curtail underestimation of effects (n=5). (Figures 3.4 & Figure 3.5). Our final analytic sample for Aim 2 (Chapter 5) includes 2,414 sexually experienced black, white and Hispanic males between 15-24 years of age. In Chapter 6, the analytic sample was limited to a subset of those in Aim 2 who report receipt of STI services or treatment in the past year and had a definitive response for past-year HIV testing (n=612).

**Measures**

*Independent variables*

**Race.** In these analyses, we examined three race-ethnic groups: non-Hispanic white, non-Hispanic black, and Hispanic males. Race was measured using the 1997 OMB standards (23) which collapses multiracial groups into the category
the respondent identifies most closely with. In the 2006-2010 NSFG, 492 of males (4.7%) reported more than one race. Each racial group excludes those who identify as Hispanic/Latino. The following questions are used to capture race and ethnicity in this analysis:

1. Are you Hispanic or Latina, or of Spanish origin?
2. Which of the groups describe your racial background? (Please select one or more groups. Options include AI/AN, Asian, Native Hawaiian/Pacific Islander, Black or White)
3. Which if these groups best describe you? (Choose 1)

SES. We use household income as a proxy for socioeconomic status (24), which was calculated by the National Center for Health Statistics using self-reported combined family income from all sources, and total household size. In this analysis, participants <200% of FPL were considered low SES with those living in households with at least 200% of FPL were classified as higher SES (25). For the purposes of this study the SES variable was reverse coded so that higher income youth (theoretically those with access to more services) served as the reference category.

Additional Sociodemographic variables

Sexual orientation. We include a measure of sexual identity. Respondents are asked to self-report their identity in the NSFG during the ACASI portion of the interview. Possible responses include “heterosexual or straight”, “homosexual or gay”, bisexual, or “something else”. Because of small sample sizes, we generated a dichotomous variable that indicates whether a respondent identified as a sexual minority (gay or bisexual).
**Age** was also included as a dichotomized grouping of 15-17 year olds and 18-24 year olds with 15-17 year olds serving as the reference group.

**Place of residence** was dichotomized from three original categories: non-metro area, greater metro area and central city. Those who live in a non-metro or greater metro area were appointed as the reference group for those who report living in central city.

**Housing status.** Housing status was also included in descriptive and bivariate analyses. Respondents who report having stayed in a shelter at any point in the year prior to the survey were coded as unstably housed.

**Incarceration.** Given the racial disparities in incarceration rates and the higher prevalence of HIV among those who have spent time in jail or prison, we control for lifetime experience of incarceration. Respondents were asked, “Have you ever spent time in a jail, prison or juvenile detention center?” Those who have not serve as the reference group.

**Access to healthcare**

Three measures of healthcare access and utilization are used. **Insurance status** was constructed using two survey questions. Respondents were asked: In the past 12 months, was there any time that you did not have any health insurance or
coverage? Those that answered “Yes” were asked, “In how many of the past 12 months were you without coverage?” In both aims, those who had health insurance for at least part of the year were coded as the reference group. Respondents were also asked whether they had a usual source of care. Those that did not were coded as the reference group.

In Aim 3, where past-year STI services were received is also captured. Responses were classified into three groups: private or HMO offices (reference group); community/family planning/school or employee clinics; and acute care settings.

Sexual Risk behavior

Treatment for STIs in past year. In Aim 2 (Chapter 5), treatment for STI services is used as a proxy for individual risk. Those who have not received STI treatment serve as the reference category.

An additional measure of high risk behavior was constructed based upon the link between these behaviors and HIV testing and use of STI services (26, 27): any anal sex, past-year intravenous drug use, five or more lifetime sexual partners, and condom use at last sex. The measure of any anal sex was derived from two questions regarding insertive and receptive anal sex. The combined measure assigns those with no anal sex history as the reference group. Those with any (insertive, receptive or both) were categorized together. We include history of anal sex separate from sexual identity as the former reflects a risk behavior while sexual identity may involve such behavior, but also reflects one’s sociocultural
position (28). Five or more lifetime sexual partners was derived from total number of sexual partners and then dichotomized. Past-year intravenous drug use and condom use at last vaginal intercourse are both self-reported measure in the ACASI section of the NSFG Condom use at last sex was reverse coded in this composite measure to align positive scores with higher risk behavior. High-risk behavior variables were condensed into a single measure of any high-risk behavior for power considerations in the multivariate analyses. This decision is in-step with the literature (29) and was adopted because these variables were not the primary focus of this analysis.

Measures for Chapter Six vary slightly from Chapter Five. Both sets of variables are included in Tables 3.1 and 3.2.

**Data analysis**

Preparatory analyses were performed to examine the missingness of explanatory variables. Sample size was allowed to float for descriptive tables and bivariate analyses. Complete case analysis was adopted for multivariate analyses and multiple imputation methods were used to check the stability of the estimates obtained using complete case analysis (See Appendix) (30, 31). Whereas the multiple imputation estimates utilize all 2,414 and 612 individuals in the analytic samples for Aims 2 and 3, respectively, the total analytic sample used in our complete case analysis omitted 347 cases in Aim 2 (n=2067) and 101 cases in Aim 3 (n=511).
Exploratory analyses examined the distribution and prevalence of lifetime HIV testing. Bivariate tests of association between lifetime HIV testing and each of the independent variables were conducted using Wald Log-Linear Chi Square tests for clustered survey data.

Chapter Five Analyses

I present three competing multivariate logistic regression models to assess the use of an intersectional paradigm to understand lifetime HIV testing among male youth. The first model reflects the dominant additive approach to exploring health disparities in which the net effects of single categories (i.e. race or socioeconomic status) on HIV testing are evaluated separately. In other words, the unitary or additive approach asks, “does race matter when it comes to HIV testing?” and responds by controlling for race as a single variable in a multivariate model (Figures 3.2 and 3.3). Models 2 and 3 consider an intersectional approach to assess disparities in testing. In Model 2, combined measures of race and SES using factor variables assess the conjoint salience of race and income in HIV testing. Model 3 examines within-race effects of income using stratified analyses.

We use these three models to answer the following questions:

1. Are disparities in lifetime HIV testing present among those with marginalized identities (as measured by race and low SES)? [Model 1; additive]

2. To what extent does an intersectional model of race and SES explain disparities in HIV testing beyond that already explained by a unitary model? [Model 2; intersectional]
3. To what extent do stratified models by race identify heterogeneity of within-race income effects? [Model 3; intersectional]

4. To what extent do other social and behavioral determinants influence lifetime HIV testing among youth? [Models 1, 2 and 3]

The regression equation used to assess the predictive effect of two independent variables (race and SES) on Y(i.e. lifetime HIV testing) is:

**Figure 3.3. Multivariate Equation of Log odds of HIV testing in lifetime**

\[
\text{Log odds}(Y=1) = \beta_0 + \beta_1(race) + \beta_2(SES) + \beta_iX_i + \mu
\]

Where:

- \(\text{Log odds} (Y=1)\) is the log odds of ever receiving an HIV test
- \(\beta_1\) is the difference in log odds of ever being tested between non-Hispanic black males (coded 1) relative to Non-Hispanic white males (coded 0), adjusting for all other covariates … \(X_i\)

The regression equation used to analyze and interpret a 2-way interaction is:

**Figure 3.4. Multivariate Equation of Log odds of HIV testing in lifetime with interaction between race and SES**

\[
\text{Log odds}(Y=1) = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3(X_1 \times X_2) + \beta_iX_i + \mu
\]

In contrast to the additive approach, the multiple approach assumes within group heterogeneity by reporting race and socioeconomic status as a two-way interaction (13).

In this second model, two-way interaction is assessed using factor variables which generate each combination of race-SES group membership (e.g. high-income whites, low-income whites, high-income blacks, etc.). I used these indicator variables to assess
whether SES alters the association between race and lifetime testing among black, white and Hispanic males. Race-stratified analyses were then conducted to assess within-race income effects.

In the regression analyses, simple tests of main effects were first conducted to examine the unadjusted odds of lifetime testing for each independent variable. Main effects for each explanatory variable are also included. The full multivariate model includes variables that emerged as statistically significant in unadjusted estimates. Those that were identified as theoretically relevant in the literature (1, 26, 32, 33), but did not emerge as statistically significant (at p=0.10) were also retained.

Chapter 6 Analyses

Chapter 6 assesses disparities in past-year HIV testing among male youth who report receiving STI services in the past year. Similar preparatory and exploratory analyses were conducted prior to running unadjusted and adjusted logistic regressions. Sample size floated to accommodate small amounts of missing data in descriptive and bivariate analyses. In multivariate analyses, complete case analysis was used (31), yielding a slightly smaller analytic sample (n=511) than the sample that met all inclusion criteria (n=612). To assess the stability of the estimates obtained using complete case analysis, multiple imputation was used in post-hoc sensitivity tests (see Appendix) (30).

Exploratory analyses examined the distribution and prevalence of past-year HIV testing. Bivariate tests of association between past-year HIV testing and each of the independent variables were conducted using Wald Log-Linear Chi Square tests for clustered survey
data. Additional bivariate tests by race and SES were also conducted to assess underlying differences in the population that may contribute to differences in HIV testing.

This paper adopts a three-stage analytical strategy identical to Chapter 5, to answer the following questions:

1. Among those who received STI testing in the past year, are disparities in past-year HIV testing present among those with marginalized identities (as measured by race and low SES)? [Model 1]

2. To what extent does an intersectional model explain variance in past-year HIV testing beyond that already explained by a unitary model? [Model 2]

3. To what extent do stratified models by race identify heterogeneity of within-race income effects? [Model 3; intersectional]

4. To what extent do other social and behavioral determinants influence past-year HIV testing among youth? [Models 1, 2 and 3]

In Model 1, the contributions of race and SES are assessed using a traditional additive approach. Model 2 considers an intersectional approach to the measure of race and SES using factor variables that combine race and SES. First, the strength and direction of the main effects of race and SES are assessed with respect to the principles of simultaneity and directionality. In Model 2, I assess whether there is a meaningful statistical interaction between race and SES that extends beyond the association found in an additive model. Finally, to assess within-race income differences in past-year HIV testing, the final model presents additive logistic regression models stratified by race.
Three possible outcomes are anticipated in these analyses: 1) main effects of race and income will be found in the additive model and will be significantly associated with testing independently and after controlling for one another; 2) the intersectional model will demonstrate the multiplicative effects of race and income (i.e. whatever disparities emerge in the additive model will be greater and AORs for low-income youth of color will be even smaller than those in Model 1); and 3) we expect that Model 3 will uncover the uneven effect of income across racial groups.

Logistic regression was used for all models. Simple tests of main effects were first conducted to examine the unadjusted odds of past-year testing for each independent variable. Significance was set at 0.05.

Post-hoc Sensitivity Analyses Chapters 5 and 6

Sensitivity analyses were conducted for year of interview to assess secular trends; and household income to ensure the cut point used (i.e. 200%) was robust to alternate specifications (i.e. 100% FPL). Analyses excluding sexual minorities were also run to assess whether the model estimates were sensitive to this subpopulation. Finally, multiple imputation methods were used to assess estimates derived using complete case analysis (30).

All analyses were conducted using STATA 12 using the “svy:” command series to account for survey design. To provide reliable estimates of the target populations,
descriptive statistics were weighted based upon the weighting scheme suggested by the NSFG.

**Ethical considerations**

The qualitative research for Chapter 4 was approved by Johns Hopkins’ Bloomberg School of Public Health Institutional Review Board. Informed consent was obtained prior to participation. Once interviews were collected, data were de-identified and stored on a secure server. Audio recordings of interviews were stored until they were transcribed and subsequently erased to further minimize risks of a breach in data. All data that is reported in Chapter 4 has been stripped of potential identifiers that could link a narrative to an individual.

Quantitative analyses (Chapters 5 and 6) were conducted using the 2006-2010 National Survey of Family Growth data set, collected by the National Center for Health Statistics (NCHS) and the University of Michigan’s Institute of Social Research (34). Informed consent was obtained from every study participant – minors were required to have the signed consent of parents before being asked for their own signed assent. Prior to data collection the NSFG was reviewed and approved by the NCHS IRB. Previous to its release, the NSFG data are stripped of personal identifiers. Johns Hopkins Bloomberg School of Public Health reviewed this secondary analysis protocol and deemed it exempt.
Chapter 3 Figures and Tables

Figure 3.1 Analytic model Aim 2: Lifetime report of HIV test among 15-24-year-old sexually experienced males in the U.S.
Figure 3.2 Analytic model Aim 3: Past year report of HIV test among 15-24-year-old sexually experienced males who used STI service in past year
Figure 3.5 Aim 2 Analytic Sample Flow chart

Males ages 15-44 n=10,403

Have you ever had sex with a female?

No (n=1,773)

Have you ever had insertive or receptive anal sex with a man?

No

n=1,665 excluded

Yes n=8,630

Yes n=108

n= 8,738 males who have ever had sexual intercourse with either a female or a male

Do you identify as White, Black or Hispanic?

No

Other race/ethnicity excluded n=745

Yes

White n=4,395

Black n=1,538

Hispanic n=2,060

Are you 15-24 years old?

No

Excluded from analysis (n=5,574)

Yes (n=2,419)

Definite response lifetime HIV testing

No

Excluded from analysis (n=5)

Yes

Total Analytic Sample: n=2,414

Complete case sample for multivariate analyses: n=2,067
Figure 3.6 Aim 3 Analytic Sample Flow Chart

Analytic sample from Aim 2 (n=2,414)

Did you receive STD treatment or testing in the past year? 

- Yes
  - Analytic sample for Aim 3 (n=812)
  - Complete Case Sample for multivariate analyses (n=511)

- No
  - Excluded from analysis (n=1800)

Definitive response to past-year HIV testing

- Yes
  - Analytic sample for Aim 3 (n=812)
  - Complete Case Sample for multivariate analyses (n=511)

- No
  - Excluded from analysis (n=2)
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<thead>
<tr>
<th>Variables</th>
<th>Variable Type</th>
<th>Description</th>
<th>Missingness</th>
</tr>
</thead>
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<tr>
<td><strong>Main independent variables</strong></td>
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<td>Categorical</td>
<td>0 = NH White 1 = NH Black 2 = Hispanic</td>
<td>None</td>
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<td>Socioeconomic status</td>
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<td>Sexual identity</td>
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<td>0 = Identifies as heterosexual 1 = Identifies as gay or bisexual</td>
<td>1.1% (n=27)</td>
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<th>Treated for an STI in past year</th>
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<th>No condom use at last vaginal sex</th>
<th>More than five lifetime sexual partners</th>
<th>Past-year injection drug use</th>
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<td>Dichotomous</td>
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<td>0.5% (n=11)</td>
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<td>0.2% (n=5)</td>
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<tr>
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<tr>
<td></td>
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<td>1 = Has stayed overnight in a shelter in the past 12 months</td>
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### Health Care Access

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<td>2.6% (16)</td>
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<td>1 = No health insurance for entire 12 months preceding survey</td>
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<td>1 = Yes</td>
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<td>Place of care</td>
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<td></td>
<td></td>
<td>1 = Community/FP/School/employer Clinic</td>
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<td></td>
<td></td>
<td>2 = Acute Care Setting (Hospital in-patient, out-patient or urgent care)</td>
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### HIV Risk Behavior

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<td>No condom use at last vaginal sex</td>
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<td>More than five lifetime sexual partners</td>
<td>Dichotomous</td>
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<td></td>
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Chapter 3 References


CHAPTER FOUR:

MANUSCRIPT 1

Stories of the self, stories of structure: Using narratives to understand how black male youth experience the intersections of race and gender identities
Abstract

**Objective:** To investigate the way in which social context, and by extension, the structural context of HIV risk, operates through racial and gender identities among urban black male youth.

**Methods:** Using 16 semi-structured iterative in-depth interviews, this paper explores how African American adolescent males living in Baltimore City describe racial and gender identities.

**Results:** Structural influences generate complex and conflicting social identities in the ways young black men in this study viewed themselves and their aspirations for fulfilling (or not) social identities. Discussions of identity stirred descriptions of gendered and classed stereotypes of black men. Racial identity stirred themes of internalized and perceived racism. These reflections, in turn, caused many of the participants to distance themselves from racial group membership, describing racial identity as peripheral to their sense of self. Aspirations of manhood were similarly bound by macro influences of economic disenfranchisement and social role absenteeism that disproportionately affect black men.

**Conclusion:** Neither race nor gender alone illuminate the social position for those who participated in this study. Findings convey the essential intersection of gender and racial identities and highlight the influence of macro forces of racism and oppression on social identity at the microlevel. Additionally, findings suggest that identity development among African American adolescents may involve constructing a positive sense of self while discrediting or differentiating themselves from negative stereotypes attributed to their ethnic/racial group membership. The need to constantly distance oneself from a negative image can have deleterious consequences on health-promoting behaviors. Results underscore the value of acknowledging multiple, competing social identities, as well as stereotype vulnerability, among youth of color and may be instructive in sociostructural approaches HIV prevention among this population.
Background
Abiding gender and racial inequalities in HIV acquisition, care, morbidity and mortality in the United States continue to disproportionately affect among black male youth, who account for more than half of new HIV infections in this age group (1-7). Young black men are the most likely to become newly infected; and although HIV testing is greatest among black men compared to other racial and ethnic groups, they more likely to be diagnosed late into the disease (8). Additionally, black men are less likely to access and receive consistent care for HIV and AIDS and are more likely than other racial and ethnic groups to die from AIDS (2, 9, 10). These disparities occur within a broader structural context of risk.

Contemporary HIV prevention approaches have prioritized biomedical and individual level interventions aimed at behavior change over social or structural sources of risk (11-14). There is evidence, however, that disparities in more proximate determinants of HIV acquisition such as sexual risk behavior, substance use and partner concurrency are often preceded by structural factors such as gender inequality (2, 11) discrimination (15), economic disenfranchisement (15-17), high rates of incarceration and violence (10), as well as limited livelihood and educational opportunities (17, 18). These issues remain particularly salient for black males in the U.S. who experience a disproportionate burden of poverty, incarceration and economic discrimination. These issues occur earlier in the causal pathway and create a context of risk that is beyond the control of individuals, and yet intimately tied to the ways in which individuals perceive and navigate decisions about their health (1, 17). Over the past decade, the call for a “combination prevention” approach has drawn attention to these issues and the importance of understanding the
degree to which structural context operates on HIV risk through self-perception (19).

There is growing evidence that identity development has critical linkages with health behavior (18, 20, 21) and subsequent health disparities (15). The establishment of racial identity has previously been linked to positive developmental milestones such as educational achievement and self-esteem (22-24). Others have examined the relationship between racial identity and sexual risk behavior among heterosexual African American men and report that positive attitudes towards racial group membership – in this case being African American – were associated with fewer sexual partners and a lower likelihood of sexually concurrency (25). Conversely, negative associations with racial group membership have been associated with elevated sexual risk behavior such as partner concurrency (26, 27) Similarly, Whitehead et al. identify that sexual risk behavior among urban African American men such as inconsistent condom use and partner concurrency are linked hypermasculine ideals (6, 28).

In this paper we examine the way in which social context, and by extension, the structural context of HIV risk, operates through racial and gender identities among urban black male youth. In particular, how do individuals subsume structural disparities in their gendered, raced, classed selves and what inferences can we make about HIV prevention based on these narratives of lived experience?

**Theoretical Framing**

The basis for the current study is grounded in two bodies of literature. First, we use social identity theory as an overarching framework to ground our inquiry into the link between
race and gender identities (29). Second, we draw on intersectionality theory to understand how narratives of social identity reflect structural discrimination experienced by black male youth living in urban areas.

*Social identity theory and health behavior*

During adolescence, youth explore their association with multiple social roles and identities – male, athlete, student, son, partner, African American – to try to make sense of who they are and map out who they might become. Social identity theory focuses on “the group in the individual” (30) emphasizing characteristics that define the “us” related to group membership (in social groups such as race, gender, or class, for example) as opposed to aspects of an individual’s unique attributes. Characteristics of social groups and roles inform characteristics of the self (i.e. who “I” am is also who “we” are), thereby offering guidelines for personal behavior and serving as markers of an individual’s social position (31-36). The process of social group identification is accompanied by a process of preferential evaluation, whereby individuals attempt to positively differentiate membership with the in-group from the out-group (30) in order to develop a positive social identity (29, 31, 37, 38). Social identity theorists propose that individuals assess the costs and benefits of belonging to specific groups. Those identities that are perceived to be ‘inferior’ or that confer lower status are managed through one of two strategies: ‘social mobility’ or ‘social change’ (39). Social mobility refers to an individual’s belief that certain social identities are mutable and that it is possible to move from one group to another (26); whereas social change refers to a process that attempts to modify a particular social identity that is not seen as particularly flexible, such as racial identity (26, 39).
Intersectionality and identity development

Intersectional theorists complicate how we understand social identity and its corollary development. They do this in two ways: first, they propose that the prevailing methods of collecting information on racial/ethnic group membership obscure a great deal of nuance in the vulnerabilities associated with minority group status. Settles et al. (2006), for example, has explored the racial and gender identities among African American women and suggests that race and gender identities are experienced simultaneously; that one cannot parse out the experience of being black from the experience of being female (40). Similarly, Bowleg (2008) explores the intersections of sexual identity and race. Her findings highlight the attendant risk of measuring marginalized statuses (i.e. race, sexual orientation, etc.) as a single axis of discrimination as it fails to capture within group heterogeneity and relative inequality in social and personal vulnerability (41). The second means of complicating identity that intersectional theorists focus on is the vital interplay between the microlevel of lived experience and macro level of structural inequalities. In her recent work, Lisa Bowleg affirms that individual identity is inextricably linked to the broader historical and contemporary forces of discrimination and oppression. She finds that the discrimination and racism experienced by low SES black men defines what it means to be a Black man in the United States (1, 2, 16-18). As a consequence, context, both historical and contemporary, operate through the individual vis-à-vis social identity to inform microlevel action such as health-seeking behavior.
Building upon this work, the following analysis explores how black male heterosexual youth articulate the racial and gendered dimensions of their identities and what their narratives imply about embodied structures of oppression.

**Methods**

Data were collected as a part of a larger qualitative study of sexually active African American adolescents, ages 18-24, in Baltimore City. Participants were purposively recruited based upon race, sex, and socioeconomic status from urban shopping malls as well as a public university located in Baltimore city. Participants were considered to be middle SES if they had two of the three following characteristics: if the residence they spent the most time in growing up was owned, if they did not receive free lunch in school, and if their primary caregiver completed any college. If they had less than two characteristics they were considered low SES. Individuals were eligible to participate if they were African American between the ages of 18-24; reported being in a heterosexual relationship (including vaginal, anal, and/or oral sex) for longer than three months anytime within the past three years; fit into one of the two SES groupings; and lived in the city study site. Written informed consent was obtained from all participants and interviews were subsequently conducted in public venues such as the mall food court, university’s student center, or on a public bench near the location of recruitment. Sixteen males participated in the study. The average age of male participants was 19 years old. Forty-three percent had a caregiver with no college education and 69% received free school lunch as a child (Table 4.1).
Questions were split between two interviews to develop rapport with participants (42). The first interview focused on narratives of how participants grew up, where they grew up, gender messaging from parents or caregivers, gender ideals, class and role models. This battery of questions was intended to elicit narratives of gendered messages heard while growing up, experiences of gender norms through familial expectations, current gender beliefs and perceptions of class. The second field guide delved into perceptions of the self in relation to gender and race. We adopted a method similar to Phinney (1992) by asking participants to spontaneously list self-attributes and then probing on these by asking open-ended questions regarding specific identities and social roles (e.g. African American, male, son, etc.) (43). Fifteen of the sixteen male participants completed both interviews.

Each interview lasted between 40 and 90 minutes. Participants were compensated $25 for the first interview and $35 for the second interview in the form of a prepaid gift card. All interviews were audio tape-recorded and transcribed verbatim by an outside transcription company. Each transcript was then reviewed alongside the audio recording to ensure the accuracy of its transcription. The study was approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board.

Data analysis was informed by both a deductive approach (44) in which themes were established a priori by the study’s research questions, the interview guides, and relevant theory, as well as through an inductive approach (45) in which themes were allowed to emerge from the data itself. The three study members who conducted the interviews also
coded transcripts. Six interviews were used to develop the initial coding scheme, and were later coded independently. The three members of the research team then applied this coding scheme to four interviews to ensure consistency in its application. In points of disagreement, a fourth study member served as an arbiter throughout the entire coding process. All transcripts were coded using Atlas.ti version 7.0. The analytic process included memo-writing as well as frequent meetings with the study team to discuss emergent themes and how these themes varied by gender and SES.

Results

The narratives of identity among male youth we interviewed embody legacies of structural oppression. Racial identity stirred themes of internalized and perceived racism. These reflections, in turn, caused many of the participants to distance themselves from racial group membership, describing racial identity as peripheral to their sense of self (i.e. lack of centrality). Aspirations of manhood were similarly bound by macro influences of economic disenfranchisement and social role absenteeism that disproportionately affect black men. Results presented here use pseudonyms to protect respondent’s identities and yet preserve the personal connection to these narratives.

Narratives of racial identity

Internalized racism. The discussion of racial identity prompted three general reactions, the first of which was an immediate reflex by participants to distance themselves from self-imposed stereotypes of what they believed were salient features of being a young African American male. These narratives reflect an internalized racism that caused many
of the participants to report feeling set apart from other African Americans. Throughout the dialogue, those we interviewed described themselves as exceptions to these stereotypes.

I don’t think I’m like other African Americans … because they… to me, I know it’s maybe like a stereotypical type view, but like they seem more ignorant than me. Like a lot of African Americans jump into things, like they keep their pride like from wherever they grew up, they keep their mindset, nothing else matters … black people usually have that mindset where their world is all that matters, and usually when people get around me I experience some of the different cultures, different things. I like a lot of history, science and stuff like that. I explore other cultures; I explore other things. (“Cory”, 19-year-old)

I don’t fit in, but I kind of-- I’m a part of them but I kind of set aside. I’m the most different one I meet, because when I meet a lot of them and they’re kind of similar. I always wonder, do they not realize that they act the same, look the same, dress the same, talk the same, think the same, not outside the box? So, I know I’m very different. I’m very different from them. (“Elijah”, 23-year-old)

**Perceived racism.** In contrast to the prior description, which highlights personally held stereotypes of race, the following narratives highlight participants’ perception of public regard, or what they thought others viewed as stereotypical. Participants shared what they believed were publicly held stereotypical characteristics of urban African Americans such as “liking fried chicken”, being “poorly dressed”, and “killers” who “disrespect women”. Instead of disavowing the stereotype, these participants attempted to refute this singular image of the group by stating that they were dissimilar from this stereotype. Unlike the first group, which did not infuse their descriptions with a gendered element, the following excerpt integrates a gendered stereotype of black males.

… certain stereotypes about African Americans I don't necessarily feel like I fit into … Well, not stereotypes, it's just how African Americans are sometimes portrayed, like, music videos and the news, and stuff like that ... Every African American not a killer, or a real evil person, walk around pants sagging down, disrespecting women, you know, stuff like that. (“Hector”, 18-year-old)
Several participants reported that they differed from the public’s perception of the group because of their educational attainment and lack of a criminal record. A 19-year old described the intersections of not only gender and race, but socioeconomic status as it relates to educational achievement and incarceration. He highlights the litany of anticipated milestones that he viewed as being typical for a black male youth such as himself. He goes on to emphasize that he is smart, a positive thinker, goal oriented and ambitious – traits that he positions as contradictions to what it means to be an African American male.

I’m different from most [African American men], though. Because … I kinda don’t fit in with the typical perception of a 19-year-old African American. Like, most of us don’t finish high school. Or have like a record. And then they say if you make it to age 25, you’re considered lucky ... And I know I’ll make 25 ... So, being as though I have no criminal background record, I’m in school, I’m furthering my education, I finished high school, I’m about to finish college, and...I don’t have any substance abuse on my record or in my history, I feel as though I’m like…beating the system, almost. Or beating the stereotype. Aside from that, I would also say I’m smart. Still goal-oriented. Positive thinker. And ambitious. (“Dante”, 19-year-old)

Racial identity on the periphery. In contrast to self-stereotyping and refuting perceptions of public regard for black men, resistance to racial group membership emerged as a prominent feature in the narratives. When asked whether and how they identify with being African American, many participants suggested that race was not a central identity for them. Instead, participants insisted that race was not only inconsequential to their identity, but also incidental. In the following quote, a 20-year old participant identifies as black, but because “everyone is different”, he renders this identity as a meaningless social marker:
Nah, I mean, there a lot of different types of people … Everybody’s different … I just happen to be black.

Similarly, a 19-year old resists identifying as African American, because it requires comparing himself to the “entire race as a whole” which would overlook his perception of the group’s inherent diversity:

… usually I don’t really compare myself to other people, so it’s kind of hard to compare myself to somebody else or an entire race as a whole, because like everybody’s different. I can’t see myself as one thing and then, like there could be other African Americans that are like me, but others that are not, I guess. I don’t know. I really can’t.

Some males interpreted racial identity as synonymous with skin color, though still reported a similar aversion to ascribe any meaning to this social group.

I don’t think skin color is really a thing, I think it’s a perception people put on things. (“Dante”, 20-year-old)

**Narratives of Gender identity**

Whereas participants resisted identifying with being African American either because of the perceived inflexibility of this grouping or because of the negative stereotypes they carried (or presumed broader society carried), participants’ discussion of male identity highlighted its essential dynamism. “Being a man” was viewed as a protean identity, one that was acquired over time, rather than being aligned with one’s sex in a static way. Instead, “becoming a man” was described as an evolitional process reached vis-à-vis economic milestones and the fulfillment of social roles. In this way, despite attempts to distance themselves from racial identity, descriptions of manhood were racially bound and reflect the context of poverty, incarceration and social instability that textures the lives of many young black men.
Gender identity is economically bound. The males in our study did not see themselves as full-fledged men yet. Most cited economic milestones that indicate the arrival of this identity. As Dante reflects, “I still think I’m growing into a man to be honest, though. ‘Cause when I still look at myself, I still look at myself as growing. So I don’t consider myself a full man yet. Commonly held markers of employment, having one’s own residence and owning a car surfaced throughout interviews:

I’m still working at it. ‘Cause I gotta be on my own, in my mind, and be like, therefore called “a man,” ‘cause a man has his own everything. So once I get my own, I’ll be fine…. Like my own place, car, and…a good job – to help take care of what I need to take care of– care of my responsibilities. (“Jason”, 18-year-old)

Until I can… be able to provide everything for myself. I feel as though if I’m still living off my mom, I’m not a full man yet. But the characteristics I want to be able to grow into, it’s like…provide for myself, taking care of all of my own responsibilities, being responsible. That’s the biggest thing right there. Taking care of my own responsibilities and not asking anyone for anything. (“Dante”, 19-year-old)

As these responses suggest, attendant to the concept of self-reliance was the importance of fulfilling responsibilities, which meant “handling what you got to handle before you can indulge in other things” (“Andre”, 20-year-old). As another participant reports, this encompasses being able to “hold your own, without nobody else’s help” (“Antoine”, 18-year-old).

Social role fulfillment and stability. Participants concretized the meaning of responsibility as synonymous with fulfilling social roles such as fatherhood and partnership. Specifically, participants incorporated being “the provider” as a critical aspect of their gender identity:
[You] got to be prepared to work. You have a lot of responsibilities; you have to take care of your family. Your family comes first. And the man’s the provider... (“Patrice”, 20-year-old)

Although being “the provider” often implied financially supporting one’s family, it also included “being there” for family. The following excerpts highlight the pervasive impact of black male absenteeism in family structure that can be ascribed to the community impact of high rates of incarceration and homicide. Just as Dante remarked that he was an exception to the typical black male because he didn’t “have a record”, the following narratives reinforce the desire to inhabit a position that is rarely afforded young black men: to be present in partnerships and in families.

If I have a kid, take care of him no matter what. If I ain’t got no money, spend time with him. Money isn’t everything but time is. Coz you can’t get that back. If I am in my child’s life, all day every day, then that’s a sign. It might not help pay for the Pampers or something but it is a start. (“Jowan”, 24-year-old)

I just want to be there for my family and to pick up my responsibility to take care of my kids. (“Patrice”, 20-year-old)

**Discussion**

The narratives of male youth in this study reflect the complex and often conflicting process in the meaning-making of “who I am”. Race or gender alone do not illuminate the social position for those who participated in this study. Instead, these findings suggest that multiple dimensions of identity are simultaneously at play and that these microlevel stories are imbued with the structural influences of racism, poverty and incarceration. Discussions of identity stirred descriptions of gendered and classed stereotypes of black men. The messages that emerged from our discussions – Don’t be too black, be financially independent, be in control; don’t be too powerful, lest you assume the black
male stereotype, but be in control and capable of “being a man” – suggest that urban black adolescent males must make sense of conflicting identities that are critical to the self in complex and sometimes incompatible ways.

Questions regarding racial identity evoked a nearly universal recalcitrance to aligning with African American group membership. Narratives reflect resistance to the perceived rigidity of racial group membership. Participants also harbored negative personal stereotypes and opposition to perceptions of others’ undesirable stereotypes of this social identity. These stereotypes, which were most often gendered accounts of the “typical black male”, confirm intersectional theorists’ key position that identities are experienced simultaneously (17, 18, 46-48). In similar fashion, concepts of manhood were bound by legacies of racism, incarceration and poverty that impact black males disproportionately (49, 50), so despite positive descriptions of being a man, these associations were universally bound by economic qualifiers such as employment, education and material assets and the ability to fulfill social roles such as partnership and fatherhood.

As other scholars have suggested, and this paper reaffirms, identity development among African American adolescents may involve constructing a positive sense of self while discrediting or differentiating themselves from negative stereotypes attributed to their ethnic/racial group membership (51-53). Tjafel suggests that identities that are perceived to be ‘inferior’ or that confer lower status are managed through one of two strategies: ‘social mobility’ or ‘social change’ (39). Social mobility refers to an individual’s belief that certain social identities are mutable and that it is possible to move from one group to
another (26); whereas social change refers to a process that attempts to modify a particular social identity that is not seen as particularly flexible, such as racial identity (26, 39). To this end, we found that participants distinguished themselves from “typical” African Americans by highlighting positive life achievements such as graduating from school and avoiding incarceration, instead of integrating their lived experience as part of a larger, more varied notion of being African American.

These findings support the literature on stereotype vulnerability, which highlights the tension that emerges when the demands of a particular identity make it difficult for an individual to perform or meet the demands of another (54). In our study, participants reported that being African American is aligned with lack of achievement and failure to fulfill social roles and responsibilities, which is at odds with how they describe male identity. Phinney (1997) has proposed that in response to these threats to low-status identities, members of minority groups may seek to distance themselves from such an identity. This ‘stereotype vulnerability’, or the need to constantly distance oneself from a negative image, can have deleterious consequences on one’s ability to construct a positive sense of self and, in turn, pursue health-promoting behaviors (35, 55, 56).

The results of our analysis should be viewed in light of several limitations. Our study focused on African American adolescent youth in Baltimore city and therefore is not necessarily representative of African American youth in other social or geographic contexts. Additionally, this data was nested within a larger study of which identity formation was not a focus, and thus the intersectional lens used to interpret our findings
was not applied to the development of the field guide. To this end, our field guide focused on specific aspects of identity that may not be central to the participants in our study, as several participants highlighted in our discussion of race. As others have noted (17, 33, 35) there are also limitations to asking questions about social identity to young adult males whose social identities are still forming. In addition, our sample was limited to males we identified as low or middle SES and therefore may not extend to higher SES young black men.

Despite these potential shortcomings, this paper has two key findings that have critical implications for public health interventions and campaigns. First, building off of the well-established evidence that supports the symbiotic relationship between social identity and behavior (20, 54, 57-59), this paper emphasizes the essential intersection of gender and racial identities. Failure to account for multiple, competing social identities, as well as stereotype vulnerability, will continue to hamstring public health efforts geared towards urban African American male youth. Second, this paper emphasizes that structural context manifests at the individual level in how people see themselves, which links this paper’s research with the literature on social identity theory and behavior change. Any intervention aimed at mitigating or promoting a certain health behavior must not only tap into the identities urban African American male youth want to cue (or hide), they must also consciously integrate how structural forces of inequality such as incarceration, educational opportunity and economic disenfranchisement, shape life events, cultural norms, individual behaviors, and the shared meaning of social behaviors.
As Frye et al. affirm, public health programming aimed at behavior change among African American men is most effective when it is grounded in “identity-related experiences and processes, specifically around fathering and fatherhood, which [constitute] opportunities to push back against structured oppression and to create more agentic and pro-social roles, behaviors, and/or spaces as African-American men” (60). Other public health interventions that leverage social identity theory and target gender norms such as Coaching Boys into Men (61) have tapped into this vein; however, the lack of cultural and socio-structural context fails to incorporate the intersectional nature that influences how male youth of color may perform their identities.

Within the framework of this dissertation, these findings present unique considerations in the context of HIV prevention efforts. As structural approaches to HIV risk reduction continue to gain traction, ongoing efforts will be maximized if they integrate social identity theory, intersectionality and the way in which structural disparities influence microlevel behavior. Although our findings do not explicitly link social identity to HIV risk behavior, they point to critical signals that others have recently begun to address in HIV prevention programming that support our formative research. For example, one recent HIV behavior change program has begun to make connections between social identity and socio-structural influences and the ways these two intersect and impact personal decision-making. The Straight Talk intervention (60) targets urban African American heterosexual men by focusing on how structural forces such as racism, discrimination, incarceration and unemployment influence sexual behavior through their influence personal and social identity (60). By engaging in culturally affirming
programming that is grounded in socio-historical context, programs such as Straight Talk illustrate the value of addressing social identity and its link to sexual health behavior in HIV prevention interventions.

Despite meaningful advances in the application of intersectionality and social identity theory in individual behavior change programs such as Straight Talk, it is essential that such programs are embedded in broader structural HIV risk reduction tactics as well. In a highly urbanized setting such as Baltimore City, where this study was conducted, the root causes of health disparities – and driving factors in racial disparities in HIV – such as incarceration, unemployment and community violence, must be addressed. These structural adjustments change the environment in which many young black men find themselves. Over time, as disparities are dismantled at the structural level, identities imbued with oppression, discrimination, or limited livelihood options may begin to change; and, so too, may individual level behavior. These shifts, in turn, have the potential to stem racial disparities in HIV acquisition and treatment that have unjustly affected young black men in the U.S.
### Chapter 4 Figures and Tables

#### Table 4.1. Description of Qualitative Sample (n=16)

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Chapter Four References


CHAPTER FIVE:

MANUSCRIPT 2

Using an intersectional lens to understand HIV testing among adolescent males in the U.S.
Abstract

Objective: To examine racial and socioeconomic disparities in lifetime HIV testing among a nationally representative sample of sexually experienced male youth 15 to 24 years of age.

Methods: Using cross-sectional data from the 2006-2010 wave of the National Survey of Family Growth (NSFG), this analysis contrasts additive and intersectional models to assess disparities in lifetime HIV testing among 2,414 sexually experienced black, white and Hispanic males between 15-24 years of age.

Results: In the additive model, we found a greater likelihood of HIV testing for black male youth compared to non-Hispanic whites (AOR: 2.35, 95%CI: 1.55, 3.56). No income effects emerged in the additive model. In the intersectional model, however, Hispanic versus non-Hispanic differences emerged within income bracket. Race-stratified analyses reveal no within-race income effect but highlighted other socio-structural factors that are inconsistently associated with HIV testing across racial groups.

Conclusions: Our findings present a bit of a paradox: results suggest that youth of color are more likely to report getting tested compared to white male youth, yet an overwhelming amount of evidence points to significant racial disparities in other aspects of the HIV care continuum that suggest that people of color are less likely to receive appropriate and timely care. Results underscore the importance of exploring disparities in HIV testing using intersectional methods. Model specification is critical to understanding potential points of intervention to improve access to and uptake of HIV testing. When analyses are limited to the traditional additive approach, racial difference in testing emerge, but within race differences in other socio-structural factors associated with testing are missed. In this regard, stratified analyses further complement evidence-based strategies by highlighting distinctive within-race differences in socio-structural factors associated with testing.
Background

The rate of HIV infection is currently on the rise among young people in the United States (1, 2). Although they comprise only 17% of the population, in 2010, 25% of new HIV infections in the U.S. occurred among youth between the ages of 13-24(3). Racial/ethnic minorities are disproportionately affected, with 44% of new infections occurring among black and 21% among Hispanic populations (4). Additionally, close to half (48%) of HIV positive youth remain undiagnosed, compared to only 25% among adults (5). Among undiagnosed HIV cases, significant racial disparities also persist. Based on a 2010 paper that estimated the prevalence of undiagnosed cases of HIV, 22.2% of black, 21.6% of Hispanic and 25.8% of Native American populations had undiagnosed HIV compared to 18.8% of whites (5). These data underscore the urgent need to understand and increase rates of testing among youth and youth of color in particular.

Innovations in antiretroviral therapy (ART) have made routine HIV testing a critical strategy in the prevention and spread of HIV (6-17). People who don't know their status contribute to 50% of new infections, and people who know their status are more likely to modify risky sexual behavior and therefore become less likely to transmit disease to others (7). Evidence also suggests that HIV positive individuals who are aware of their status reduce their frequency of unprotected sex with seronegative partners (18). Additionally, early detection and treatment decreases viral load and therefore reduces risk of transmission to those who are HIV negative (19). Despite these well-acknowledged benefits of HIV testing, suboptimal rates of testing persist among sexually active youth (2).
Although HIV testing is a key strategy in the prevention and spread of HIV, research on factors associated with testing remains relatively understudied among youth of color. Research on barriers and facilitators of testing has focused either on broad barriers to policies and health systems factors, or hones in on key high-risk populations such as men who have sex with men (22) homeless men (16), or those who are HIV positive. Among the work that has examined HIV testing among racial/ethnic minority populations, much of it focuses on adults (6, 11, 14, 23, 24).

**Racial and socioeconomic disparities in testing**

Data suggest that African American men and women are more likely than whites or Hispanics to get tested for HIV, although the drivers for this are not well understood (11, 23, 24). In fact, much of the literature points to factors that should theoretically produce lower odds of testing among minority populations. For example, Simmons et al. found racial differences in attitudes towards testing among a sample of people with advanced HIV and report that black females were significantly more likely than white or Hispanic females to underestimate their risk of HIV acquisition (25). Similarly, in a 2011 Kaiser Family Foundation report, African Americans who had never been tested for HIV report that low risk perception was their number one reason for not getting tested (26). Stigma and the loss of social capital have also been cited among African Americans as barriers to testing (16, 27, 28). Research on Hispanic/Latino populations demonstrates similar motivations for testing. In a 2010 study based on the National Health Interview Survey, more than two-thirds of Latinos who were surveyed had never been tested for HIV, and...
the vast majority (88%) expressed no intention to get tested (29). High risk behavior and perceptions of high-risk was associated with testing, though one in four with those characteristics had never been tested, suggesting that overall testing among Latinos is suboptimal.

Individual level factors such as risk perception or perceived stigma of testing play out in a larger context of health care provision. In a larger community-based sample, Holmes et al. identify that racial differences in individual motivations for testing exist, but that inequality in service provision also plays a role. The authors noted that although blacks were more likely to report voluntary testing compared to whites or Hispanics, they were less likely to receive an HIV test in relation to routine health care (11). Similarly, a 2007 survey of racial disparities in HIV testing suggests that although blacks are more likely to get tested than Hispanics or whites, close to 70% of black men and women surveyed in a recent study report never being offered a test by a provider (30). These findings suggest systems-level inequities in the provision of routine recommended care.

Differences in point of care service provision are part of broader racial and socioeconomic disparities in access to services. Access to health services is a key barrier that routinely affects racial/ethnic minorities and low-income populations (7, 14). Those without routine exposure to healthcare system are often missed in routine HIV testing (31). In a 2009 community-based sample of African American males living in Wisconsin, the strongest predictor of testing was having a regular source of care (32). Racial and ethnic differences in place of care have also been cited as a factor associated with
disparities in testing among women, with white and black women more likely to be tested at a private physician’s office or HMO location versus Hispanic women who were more likely to be tested at a clinic (14). While data are less specific for youth, evidence shows that minority youth are less likely to have access to and receive preventive health care than non-Hispanic white youth (33).

The role of socioeconomic status in HIV testing has been less well explored; however, research on the correlation between SES and the use of other preventive health services suggests it is a critical factor in HIV testing (34-36).

**Intersecting disparities**

In general, racial disparities in the HIV epidemic can be understood as a product of longstanding and contemporary processes that continue to disenfranchise and oppress those with multiple marginalized statuses. Poverty, mass incarceration, limited educational and employment opportunities as well as access to healthcare all contextualize this issue (7, 37-39). In this way, race, in its intersection with poverty, sexual orientation, gender or age can be considered a multifaceted measure of social exclusion.

A growing body of work suggests that preventive health behaviors such as HIV testing among high-risk populations must adopt an intersectional lens that acknowledges how multiple dimensions of social position, such as income, sexual orientation, or gender, may play a role in health-seeking behavior, and may interact with one another (40-47). However, very few quantitative applications have explicitly evaluated Intersectional
Theory in HIV testing among youth (47-49). Robinson et al. presents one of the few analyses that examine within and across group racial differences in HIV testing among high-risk adults (14). Their findings highlight distinctions in sociodemographic factors associated with testing across race/ethnic groups including education, age and income (14). Across all race/ethnic groups, age and education were positively associated with HIV testing, with 18-24 year olds the less likely to be tested than older age groups. The authors also found that income positively affected HIV testing among Hispanics, but was not associated with HIV testing among whites or blacks. Robinson’s findings are some of the first we are aware of that highlight the within group heterogeneity of racial/ethnic groups and how these differences correlate with HIV testing behavior. In the following analysis we attend to a similar gap among youth by examining within and across group racial and income differences in lifetime HIV testing among a nationally representative sample of sexually experienced male youth 15 to 24 years of age.
Methods

Data Source and Sample

The following study is based on secondary analysis of cross-sectional data from the 2006–2010 wave of the National Survey of Family Growth (NSFG). The NSFG is a nationally representative multistage probability sample designed to gather information on various fertility-related topics such as contraception, birth intervals, sexual activity and family formation. The 2006–2010 NSFG is based on 22,682 face-to-face interviews in the U.S. household population aged 15–44 (12,279 with women and 10,403 with men). The 2006–2010 wave of data oversampled youth ages 15-19 as well as black and Hispanic adults. One person from each home was selected at random for data collection and interviews were administered in the home by a trained female interviewer using computer-assisted personal interviewing (CAPI) as well as audio computer-assisted self-interview (ACASI) for more sensitive items in the survey including past incarceration, housing instability, substance use, sexual behavior, sexual orientation, and income. The overall response rate for the 2006–2010 NSFG was 77%.

Study Sample: sexually experienced males ages 15-24

There were several inclusion criteria for these analyses. First, males who reported ever having sexual intercourse with either a male or female were included. Respondents who answered yes to the following questions were considered sexually experienced and thus included in these analyses (n=8,738):

Have you ever had sexual intercourse?
Has another male ever put his penis in your rectum or butt (anal sex)?
Have you ever put your penis in his rectum or butt (anal sex)?
The sample was further narrowed to non-Hispanic black, non-Hispanic white and Hispanic males. Race was measured using the 1997 OMB standards (50) which collapses multiracial groups into the category the respondent identifies most closely with. In the 2006-2010 NSFG, 492 of males (4.7%) reported more than one race. Each racial group excludes those who identify as Hispanic/Latino. Specifically, males who identified as a single race (white or black) or identified as Hispanic were included (n=7,993). Those who identified as multiracial or other ethnicities were excluded from this analysis due to small sample size and lack of clarity in this category (n=745). The following questions are used to capture race and ethnicity in this analysis:

*Are you Hispanic or Latina, or of Spanish origin?*

*Which of the groups describe your racial background? (Please select one or more groups. Options include AI/AN, Asian, Native Hawaiian/Pacific Islander, Black or White)*

*Which if these groups best describe you? (Choose 1)*

All those who were older than 24 were also excluded (n=5,574). The sample was finally narrowed to those who had explicitly stated “yes” or “no” for whether they had ever been tested for HIV outside of a blood donation; respondents with unknown or refused were excluded from these analyses to curtail underestimation of effects (n=5). Our final analytic sample includes 2,414 sexually experienced black, white and Hispanic males between 15-24 years of age.
Measures

**Dependent variable:** The dependent variable of interest is self-report of lifetime HIV testing outside of blood donations. Respondents were asked, “*Not counting tests you may have had as part of blood donations, have you ever been tested for HIV?*”, with never-testers coded as the reference group.

**Independent variables**

**Race/ethnicity.** Three race-ethnic groups are included in this analysis: non-Hispanic white, non-Hispanic black, and Hispanic males, with white males serving as the referent category.

**SES.** We use household income as a proxy for socioeconomic status (51), which was calculated by the National Center for Health Statistics using self-reported combined family income from all sources, and total household size. In this analysis, participants <200% of FPL were considered low SES with those living in households with at least 200% of FPL were classified as higher SES (52). For the purposes of this study the SES variable was reverse coded so that higher income youth (those with theoretically greater access to resources and services) served as the referent category.

**Additional Sociodemographic variables**

**Sexual orientation.** Respondents are asked to self-report their sexual orientation in the NSFG during the ACASI portion of the interview. Possible responses include “heterosexual or straight”, “homosexual or gay”, bisexual, or “something else”. Because
of small sample sizes, we generated a dichotomous variable that indicates whether a respondent identified as a sexual minority (gay or bisexual).

**Age** was also included as a dichotomized grouping of 15-17 year olds and 18-24 year olds with 15-17 year olds serving as the reference group.

**Place of residence** was dichotomized from three original categories: non-metro area, greater metro area and central city. Those who live in a non-metro or greater metro area were appointed as the reference group for those who report living in central city.

**Housing status.** Being unstably housed is associated with both increased HIV risk behavior as well as barriers to accessing healthcare services such as HIV testing (53) and was thus included in descriptive and bivariate analyses, though was excluded from full multivariate models due to power constraints. Respondents who report having stayed in a shelter at any point in the year prior to the survey were coded as unstably housed.

**Incarceration.** Given the racial disparities in incarceration rates and the disproportionate prevalence of HIV among incarcerated men, as well as the barriers to care that incarcerated or justice-involved males often face (54), we control for lifetime experience of incarceration. Respondents were asked, “*Have you ever spent time in a jail, prison or juvenile detention center?*” Those who have not serve as the reference group.
Access to healthcare

Two measures of health care access and utilization of care are used.

Insurance status. Insurance coverage was constructed using two survey questions. Respondents were asked: *In the past 12 months, was there any time that you did not have any health insurance or coverage?* Those that answered “Yes” were asked, *“In how many of the past 12 months were you without coverage?”* In both aims, those who had health insurance for at least part of the year were coded as the reference group.

Usual source of care. Respondents were also asked whether they had a usual source of care. Those that did not were coded as the reference group.

HIV Risk behavior

Two key measures were included to account for differences in risk behavior that have been linked HIV testing (7, 55): treatment of STIs in the past year (as a proxy for sexual risk) and a summary index of behavioral risk factors that have been associated with HIV: any anal sex, past-year intravenous drug use, five or more lifetime sexual partners, and condom use at last sex. High-risk sexual behavior variables were condensed into a single measure of any high-risk behavior for power considerations in the multivariate analyses.

STI treatment. Because of the epidemiologic synergy between STIs and HIV, treatment for STI services should theoretically co-occur with HIV testing. In this analysis, we use history of STI treatment as a proxy for sexual risk. Those who have not received STI treatment serve as the reference category.
**Anal sex.** The measure of any anal sex was derived from two questions regarding insertive and receptive anal sex. The combined measure assigns those with no anal sex history as the reference group. Those with any (insertive, receptive or both) were categorized together. We include history of anal sex separate from sexual identity as the former reflects a risk behavior while sexual identity may involve such behavior, but also reflects one’s sociocultural position (56).

**Number of sexual partners.** Five or more lifetime sexual partners was derived from total number of sexual partners and then dichotomized.

**Intravenous drug use.** Past-year intravenous drug use was ascertained using the following question: “During the last 12 months, how often have you shot up or injected drugs other than those prescribed to you? By shooting up we mean anytime you might have used drugs with a needle, by mainlining, skin-popping, or muscling”. Those who have abstained from past-year intravenous drug use serve as the reference category.

**Condom use.** Condom use at last vaginal sex was measured by asking: “Did you use a condom the last time you had vaginal intercourse with a female?”. Lack of condom use at last sex was coded as “1”, with condom users as the reference category.

In this composite measure all risk behaviors were coded to align positive scores with higher risk behavior (i.e. the reference group was always the group that did not report a specific risk behavior). To dichotomize this index, those who report any of the four behaviors were coded as “1” and those that report none of the 4 behaviors were coded as
the reference group. This decision is in-step with similar analyses (57) and was adopted because these variables and specific HIV risk sources were not the primary focus of this analysis.

**Analysis**

Preparatory analyses were performed to examine the missingness and collinearity of explanatory variables. Exploratory analyses examined the distribution and prevalence of lifetime HIV testing. Bivariate tests of association between lifetime HIV testing and each of the independent variables were conducted using Wald Log-Linear Chi Square tests for clustered survey data.

Based upon the theoretical and qualitative grounding provided in Chapter 2 and Chapter 4, we assess whether McCall’s approach to intercategorical complexity and Veenstra’s analytic methods (58, 59) would help uncover and perhaps better explain any noted racial disparities in HIV testing among male youth.

In the first model, a traditional additive approach is tested using multivariate logistic regression. Models 2 and 3 consider an intersectional approach to assess disparities in testing. In Model 2, combined measures of race and SES using factor variables assess the conjoint salience of race and income in HIV testing. Model 3 examines within-race effects of income using stratified analyses. We use these three models to answer the following questions:

1. Are disparities in lifetime HIV testing present among those with marginalized identities (as measured by race and low SES)? [Model 1; additive]
2. To what extent does an intersectional model of race and SES explain disparities in HIV testing beyond that already explained by a unitary model? [Model 2; intersectional]

3. To what extent do stratified models by race identify heterogeneity of within-race income effects? [Model 3; intersectional]

4. To what extent do other social and behavioral determinants influence lifetime HIV testing among youth? [Models 1, 2 and 3]

Three possible outcomes are anticipated in these analyses: 1) race and income will exert independent effects on HIV testing (i.e. race and income will both be associated with HIV testing with youth of color and low income youth less likely to report HIV testing). To assess this, the strength and direction of the main effects of race and SES are assessed with respect to the principles of simultaneity and directionality (48). Simultaneity reflects the assumption that race and SES will be significantly associated with past-year HIV testing independently and after controlling for one another. Directionality suggests that youth of color and low SES youth will exhibit lower likelihood of receiving an HIV test. The second anticipated outcome is tested in Model 2 (the intersectional model), which we expect will illustrate heightened disparities among those with multiple marginalized identities (i.e. AORs for low-income youth of color will be even smaller than those in Model 1); Factor variables which generate each combination of race-SES group membership (e.g. high-income whites, low-income whites, high-income blacks, etc.) are used to assess this hypothesis. Finally, we expect that Model 3 will uncover income effects across racial groups. To assess within-race income differences in HIV testing, this final model presents additive logistic regression models stratified by race.
Logistic regression was used for all models. Simple tests of main effects were first conducted to examine the unadjusted odds of lifetime testing for each independent variable. Significance was set at 0.05 for all models.

Post-hoc sensitivity analyses were conducted for household income to ensure the cut point used (i.e. 200%) was robust to alternate specifications (i.e. 100% FPL) (See Appendix). Additionally, sexual minorities were excluded (N=75) from the analysis to assess how sensitive the estimates were to this population’s responses. In bivariate analyses, sample size floated to accommodate small amounts of missing data. Complete case analysis was used to conduct multivariate analyses. Because some of the analytic sample is excluded (n=347) when using complete case analysis, multiple imputation (60) was also conducted to check the potential biases in estimates that can be present in complete case analysis (60). Results from the multiple imputation estimates are displayed in the Appendix. All analyses were performed using STATA 12 using the “svy:” command series to account for survey design (61). To provide reliable estimates of the target populations, descriptive statistics were weighted based upon the weighting scheme suggested by the NSFG.

**Ethical Approval**

Prior to data collection, the NSFG was reviewed and approved by the National Center for Health Statistics (NCHS) IRB. During data collection, informed consent was obtained from every study participant. Minors were required to have the signed consent of parents
before being asked for their own signed assent. Previous to its release, the NSFG data were stripped of personal identifiers. The Institutional Review Boards at Johns Hopkins Bloomberg School of Public Health in Baltimore, Maryland reviewed and approved this research as exempt.

Results

Sample characteristics and prevalence of HIV testing

Demographic characteristics of men by whether or not they have tested for HIV in their lifetime are presented in Table 5.1. Among the 2,414 sexually experienced males in our sample, 33.9% have ever been tested for HIV. The majority of the males in our sample were white (62%), between the ages of 18-24 (86%) and identified as straight (97%). Most lived in a non-urban area (66%) and in a household with an income above 200% FPL (55%). The majority of the sample also report having a usual source of care (68%) and having health insurance for some portion of the year prior to the survey (79%). With respect to HIV behavioral risk characteristics, 63% of the sample reported at least one high-risk behavior. Only five percent of the sample had been treated for an STI in the past year. Additionally, the majority of males in the sample report never having anal sex (97%) or using intravenous drugs during the past year (99%). Slightly less than half report having five or more sexual partners (47%) and close to two thirds (61%) report using a condom at last vaginal intercourse.

Lifetime HIV testing varied significantly by race, household income, age, sexual identity and history of incarceration. Table 5.1 also highlights the bivariate differences in lifetime testing across key sexual risk behaviors. Significant differences in testing behavior were
found across all sexual risk behaviors with greater proportions of males testing among those who report high-risk behavior. Having a usual source of care and lacking health care coverage were inversely associated with lifetime testing (p=0.025 and p<0.001, respectively).

Tables 5.1a displays descriptive statistics by race. Significant racial differences in HIV testing, income, age, place of residence and history of incarceration are present. Most significant to this analysis are the racial disparities in household income. Over 58% of black male youth and 59% of Hispanic youth report household incomes less than 200% of the FPL, compared to only 36% of non-Hispanic white male youth. Significant differences in both healthcare access measures were also found. Behavioral differences by race were also detected with 70% black and Hispanic males reporting at least one high-risk behavior compared to only 59% of non-Hispanic white males (p<0.001). More black males reported past-year STI treatment (9.3%) compared to 3.9% of Hispanic males and 4.2% of white males (p=0.002). Additional descriptive tables stratified by race and income are provided in the Appendix.

**Model 1: Additive model**

Table 5.2 illustrates the additive regression models for lifetime HIV testing. In the race and income only model, Black males were significantly more likely to report having ever been tested compared to white males (OR: 2.48, 95%CI: 1.77, 3.47) whereas Hispanic youth were no more likely than whites to report being tested. Household income had no significant effect on HIV testing in this model. In the fully adjusted model, these trends
persist, with income remaining non-significant and identifying as black still significantly associated with a greater odds of being tested for HIV (AOR: 2.35, 95%CI: 1.55, 3.56).

**Model 2: Race-SES intersection**

In the two-way interaction of race and SES (Table 5.3), significant main effects were only found for high and low income black youth. The odds of ever testing among high SES black youth (OR: 3.34, 95%CI: 2.06, 5.44) and low SES black youth (OR: 2.73, 95% CI: 1.85, 4.03) were statistically significantly greater than the odds of testing for high-income NH-white males in the race-income only model. In the fully adjusted model, the odds of lifetime testing among higher-SES black males was 3.2 times greater than NH-white males of similar income, all other factors being equal (AOR: 3.19, 95%CI: 1.83, 5.57). Lower-SES black males also had greater odds of lifetime testing compared to higher-SES white males (AOR: 2.38, 95% CI: 1.50, 3.77). Additionally, within-income racial differences emerged for Hispanic male youth (compared to non-Hispanic males) (AOR: 1.63, 95% CI: 1.03, 2.59).

Similar to results in the fully adjusted additive model (Model 1), age, identifying as a sexual minority, being treated for an STI and reporting any high risk behavior were all strongly associated in Model 2. In both Models 1 and 2, the main effects of having a usual source of care and insurance status were attenuated in the full multivariate model.

**Model 3: Race-stratified models**

Table 5.4 presents additive logistic models stratified by race. Income was not significantly associated with HIV testing in any racial group. Findings suggest that other
socio-structural factors associated with HIV testing differ within and across racial groups. Among non-Hispanic whites, sexual orientation (AOR: 3.56, 95% CI: 1.23, 10.35), a history of incarceration (AOR: 2.08, 95% CI: 1.16, 3.73) and high-risk behavior (AOR: 3.93, 95% CI: 2.54, 6.10) were positively associated with HIV testing. Among black male youth, the latter two of these covariates were associated with testing (AOR for incarceration: 2.26, 95% CI: 1.1, 4.66; AOR for risk behavior: 2.48, 95% CI: 1.33, 4.65), in addition to age (AOR: 3.12, 95% CI: 1.37, 7.08) and past-year treatment for an STI (AOR: 5.22, 95% CI: 1.57, 17.36). Among Hispanic youth, identifying as a sexual minority (AOR: 4.0, 95% CI: 1.13, 13.97) and past-year treatment for an STI (AOR: 20.6; 95% CI: 6.79, 62.3) were positively associated with HIV testing.

Post-hoc sensitivity analyses

Sensitivity analyses were conducted to assess potential effects of survey year, sample selection, income cut-point and complete case approach. In bivariate tests of survey year with the outcome, no differences were found (see Table A5.7 in Appendix). In tests of income cut point, within-income estimates were affected: the significance in the fully adjusted interaction model for Hispanic males (versus non-Hispanic) was attenuated from AOR=1.63, p<0.05 to AOR=1.29 p=0.28). In assessing whether or not our estimates were sensitive to male youth who identified as sexual minorities, sensitivity analyses indicated influence on model estimates for Hispanic males (Table A5.4): in the unadjusted intersectional model, the odds of testing for higher income Hispanic male youth became significant at p<0.05 (OR moved from 1.46 to 1.56), whereas these estimates were only significant in the adjusted models in the primary analysis. Multiple imputation estimates
were roughly similar to complete case estimates, except for higher income Hispanic males, whose adjusted odds of ever being tested became non-significant.

Discussion

In this paper we apply an intersectional lens to explore how race and socioeconomic status are associated with lifetime HIV testing among a nationally representative sample of 2,414 sexually experienced 15-24-year-old males in the U.S. Using multivariate regression modeling we aimed to answer four primary questions. First, are disparities in lifetime HIV testing present among those with marginalized identities (as measured by race and low SES)? Second, to what extent does an intersectional model explain variance in HIV testing beyond that already explained by a unitary model? Third, how might within-race income effects differ? And finally, how important are other social and behavioral determinants of health in lifetime HIV testing among youth?

Our primary hypotheses, that groups with multiple marginalized statuses (i.e. racial minorities who are low SES) would have lower odds of testing compared to both the higher income white population as well, as higher income youth within the same racial and ethnic identities, did not bear out. We found that although race and certain race-income groups were associated with HIV testing, we failed to observe a lower likelihood of testing among either racial minority or low-income youth. In fact, in the additive model, no income effect is observed at all. Instead, black youth in our sample were more likely than white youth to report getting tested. Even when controlling for high-risk behavior and factors such as access to care, identifying as black was strongly associated with an increased odds of testing for HIV. Our results related to an increased odds of
testing among black male youth is supported by the literature (55, 57, 62). These findings may be explained by a higher prevalence of HIV infection which may, in turn, accentuate a greater perceived threat of HIV transmission within the Black community. Although, other studies have found contradictory evidence of very low perceived risk among the black community as well (63). Our findings may also be a product of targeted testing strategies by healthcare providers (based on known racial disparities in HIV infection) (64, 65).

In our intersectional model, we examine whether the concomitant effects of race and income are associated with HIV testing. We expected to observe a decreased likelihood in testing among those with multiple marginalized identities (i.e. low-income youth of color). Although within-income racial differences in HIV testing emerged, the income effect we anticipated was inverted. Instead of finding that youth of color were less likely than higher income white males, we noted greater odds of testing for high-income Hispanic youth as well as lower and higher-income black males. Findings for Hispanic youth were sensitive to model specifications in the sensitivity analyses that examined household SES below 100% of the FPL, as well as the inclusion of youth who identified as gay or bisexual. Nonetheless, our findings contrast other research that has drawn attention to the prohibitive effect low income status can have on HIV testing behavior (13-16, 24, 31, 55). These studies, however, focus on community-based adult samples of high-risk populations, in contrast to the nationally representative sample of youth used in this analysis, which may explain the contradiction in our findings.
In our stratified analyses analysis, we did not observe within-race income effects. However, these analyses highlighted critical distinctions in within-race variations of other correlates of HIV testing that point to the need to tailor interventions to racial/ethnic sub-populations. In the first two models, sociodemographic characteristics, measures of healthcare access and HIV behavioral risk factors, revealed mixed findings. The first two models confirm the relationship between sexual minority status and lifetime testing among adolescent males; however, the stratified analyses indicate that gay and bisexual black men do not report an increased odds of testing compared to black heterosexual males. Had our analyses stopped just prior to model 3, the correlation we observed could be explained as reflective of higher levels of perceived and actual risk behavior among sexual minorities, which other research has indicated is associated with testing behavior (1). However, the lack of association between sexual minority status and HIV testing among black males highlights a critical detail and underscores the value of intersectional analyses in disparities research. Data suggest that HIV-positive black gay and bisexual men are the least likely to know their status compared to Hispanic and white men – only 54% of HIV-positive black gay and bi-men know their serostatus, compared with 63% of Hispanic/Latino gay and bisexual men, and 86% of white gay and bisexual men (4). The stratified models in this paper confirm this to be a likely trend among male youth as well and support the need for more targeted strategies to increase testing among black gay and bisexual youth.

Similar to sexual orientation, Models 2 and 3 highlight that older youth and those with a history of incarceration were more likely to be tested, both of which have been identified
as correlates of HIV testing by prior research (7). However, within-race analyses suggest these factors are not consistently associated with testing behavior. Similarly, our analyses emphasize a strong correlation between HIV risk behavior and HIV testing; but when examined within racial groups, we see that risk behavior does not signal increased odds of testing for Hispanic youth. These findings contrast several studies that have reported nonsignificant associations between risk behavior and testing among high-risk adult heterosexual populations (63). This difference highlights a potentially important distinction between adolescent testers and adult testers – white and black male youth may be more inclined to get tested based upon high-risk behavior than adults.

This analysis offers an additional point of departure from prior research. We did not find evidence to support the association between barriers to care such as having a regular source or care and being insured with HIV testing among youth. This is surprising given the racial and socioeconomic differences we noted in this population (Table 5.1a) as well as the prior research that notes the barriers to healthcare seeking among minority and low-income populations (34, 66, 67) as well as adolescents (68-71).

Our findings present a bit of a paradox: these analyses suggest that youth of color are more likely report getting tested compared to white male youth, yet an overwhelming amount of evidence points to significant racial disparities in other aspects of the HIV care continuum that suggest that people of color are less likely to receive appropriate and timely care (5, 23, 72-74). With respect to Hispanic/Latino youth, others have reported that Latinos are more likely than whites to receive a late diagnosis for HIV (75). Wohl
(2009) has documented similar disparities among Spanish-speaking residents in Los Angeles who were three times more likely to present late compared to English-speaking Latinos (65). In a 2012 systematic review, Chen et al. affirm that Hispanics test later into the HIV continuum than whites (76). Similarly, the CDC reports that African Americans are the least likely to be engaged in care or have the virus under control (77). These data further complicate our understanding of the behavioral and structural drivers that influence HIV testing among a population disproportionately affected by HIV acquisition and beg further inquiry as to why racial disparities in HIV care and morbidity persist despite higher testing rates among youth of color. Intersectional analyses of other aspects of the HIV care continuum may provide a more nuanced understanding of this incongruity.

There is clear evidence that HIV testing is not enough to attenuate racial disparities in the HIV care continuum and intersectional approaches to this issue offer a promising way forward. Recent estimates suggest that an upwards of 30% of people who know their serostatus are not accessing care, with youth ages 13-24 and black men and women least likely to be linked to care (20, 72). Given what we know about racial disparities in the care continuum, there is an urgent need to better understand the intersectional drivers behind engagement in care as well as those who fall out of care.

This analysis bears several limitations. Data used in these analyses were crosssectional, therefore causal inferences cannot be deduced. It is possible, to this end, that HIV testing occurred prior to other behaviors or sociodemographic factors, including household
income, which can fluctuate over time. Additionally, HIV testing remains a sensitive topic, particularly for some communities and because this survey relies on self-reported data, testing history as well as other sexual risk behaviors might go underreported, even with the use of ACASI. Recall bias is also a possibility with lifetime measures – there is a risk of a telescoping effect which generally results in underestimation among those who experienced an event (i.e. HIV testing) in the more distant past (78). Finally, there are factors central to HIV testing that our study was not able to measure. Contextual measures of poverty and access (e.g. the % of a census tract living below the poverty line) have been shown to have a significant impact on access to services and health behavior among young men and require continued attention with respect to HIV testing among minority youth.

Our ability to model intersectionality between race and SES and HIV testing was constrained by our selected data source. The NSFG was not specifically intended to answer our research question which would have benefitted from additional variables related to family wealth. As has been noted by others, quantifying intersectional identities is difficult and limitations to the measurement of SES are of particular concern throughout social sciences research (79, 80). Investigators grapple with the inclusion or exclusion of possible indicators, as well as the question of which most accurately explain the construct in the United States (81). We chose to use household income, which is subject to reporting error and also prone to change over time (81). Moreover, adolescents may not be well informed about all streams of income a household receives. Using a dichotomized measure of household income is reductionist in its attempt to encapsulate
intersectional identities, and although alternative specifications were examined in sensitivity analyses, our approach to modeling SES may be the explanation for non-significant differences. Furthermore, our approach implies that those who live under the poverty line somehow share a similar position/lived experience, which risks generating an equally problematic social fiction. Despite these shortcomings, the use of a large, nationally representative sample of sexually experienced adolescent males permits generalizability of our findings to the broader U.S. population.

This paper has several notable implications. One of the targets set forth in the 2015 National HIV/AIDS Strategy is to increase the percentage of people who are living with HIV who know their serostatus from 85% to 90% by 2020(20). This analysis underscores the importance of this recommendation, highlighting the suboptimal testing rates among all youth in our sample. More specifically, our analyses underscore the importance of exploring disparities in HIV testing using intersectional methods. The concomitant assessment of multiple markers of social position used in intersectional analyses yield more specific insights on points of intervention than the additive model alone. Model specification is critical to understanding potential points of intervention to improve access to and uptake of HIV testing among specific subpopulations of youth. Stratified analyses further complement evidence based strategies that target population-specific drivers of testing by highlighting within-race differences in socio-structural factors associated with testing. Overall, the correlates of HIV testing among youth contrast many of the findings in adult populations suggesting that different emphasis needs to be placed on youth and subpopulations within this age group. Although black male youth and
higher income Hispanic youth demonstrate greater likelihood of testing for HIV, much work remains to ensure the persistent disparities in the HIV care continuum are attenuated. Current results suggest that an intersectional approach is essential in this regard.
## Chapter 5 Figures and Tables

### Table 5.1. Description of Sample by lifetime HIV Testing History among sexually experienced male youth 15-24

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Col %</th>
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<th>Row%</th>
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<th>p-value</th>
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<tr>
<td><strong>Total Sample (n=2,414)</strong></td>
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<tr>
<td>Tested in lifetime</td>
<td>33.9</td>
<td>[30.6,37.4]</td>
<td>846</td>
<td>70.9</td>
<td>[66.2,75.3]</td>
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<td>[24.7,33.8]</td>
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<tr>
<td><strong>Sociodemographics</strong></td>
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<tr>
<td>Race</td>
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<td>[24.7,33.8]</td>
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<td>[45.2,57.4]</td>
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<td>Hispanic</td>
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<td>[60.4,71.0]</td>
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<td>[29.0,39.6]</td>
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<td><strong>HH Income &lt; 200% FPL</strong></td>
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<td>45.0</td>
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<td>[58.1,66.9]</td>
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<td>0-99% of Poverty Level</td>
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<td>[54.2,67.3]</td>
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<td>[32.7,45.8]</td>
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<td>100-199%</td>
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<td>[57.9,70.0]</td>
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<td>[30.0,42.1]</td>
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<tr>
<td>200-299%</td>
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<td>[16.6,21.6]</td>
<td>440</td>
<td>69.2</td>
<td>[61.5,76.0]</td>
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<td>[24.0,38.5]</td>
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<td>300-399%</td>
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<td>[59.4,73.5]</td>
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<td>[26.5,40.6]</td>
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<td>400-499%</td>
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<td>[7.4,10.9]</td>
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<td>65.6</td>
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<td>[26.2,43.7]</td>
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<td>500+</td>
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<td>[7.6,12.9]</td>
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<td>[17.9,33.6]</td>
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<td>[11.8,15.8]</td>
<td>422</td>
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<td>[74.3,85.9]</td>
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<td>[14.1,25.7]</td>
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<td>[84.2,88.2]</td>
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<td>[59.9,67.4]</td>
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<td>[32.6,40.1]</td>
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<td><strong>Sexual minority</strong></td>
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<td>Yes</td>
<td>2.8</td>
<td>[2.0,3.8]</td>
<td>75</td>
<td>30.8</td>
<td>[17.6,48.1]</td>
<td>69.2</td>
<td>[51.9,82.4]</td>
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<td>[96.2,98]</td>
<td>2,312</td>
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<td>[63.6,70.2]</td>
<td>33.0</td>
<td>[29.8,36.4]</td>
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Table 5.1 Continued. Description of Sample by lifetime HIV Testing History among sexually experienced male youth 15-24

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<th>Total Sample (n=2,414)</th>
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<tr>
<td></td>
<td>Col % 95% CI</td>
<td>N† Row % 95% CI</td>
<td>Row % 95% CI</td>
<td>Row % 95% CI</td>
<td>p-value</td>
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<tr>
<td>Lives in an urban area</td>
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<td>Yes</td>
<td>36.9 [31.6,42.4]</td>
<td>1,045 62.0 [56.5,67.2]</td>
<td>38.0 [32.8,43.5]</td>
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<tr>
<td>No</td>
<td>63.1 [57.6, 68.4]</td>
<td>1,369 68.5 [64.0,72.6]</td>
<td>31.5 [27.4,36.0]</td>
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<tr>
<td>Homeless in past year</td>
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<tr>
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<td>1.3 [0.9,2.0]</td>
<td>41 49.5 [29.1,70.1]</td>
<td>50.5 [29.9,70.9]</td>
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<tr>
<td>No</td>
<td>98.7 [98.0,99.1]</td>
<td>2,368 66.3 [62.8,69.7]</td>
<td>33.7 [30.3,37.2]</td>
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<td>Lifetime incarceration</td>
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<td>Yes</td>
<td>14.0 [11.9,16.5]</td>
<td>319 44.8 [37.0,52.9]</td>
<td>55.2 [47.1,63.0]</td>
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</tr>
<tr>
<td>No</td>
<td>86.0 [83.5,88.1]</td>
<td>1,820 71.4 [67.9,74.6]</td>
<td>28.6 [25.4,32.1]</td>
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<tr>
<td>Healthcare access</td>
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<tr>
<td>Lacked health insurance the year prior</td>
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<td>Yes</td>
<td>20.9 [17.8,24.4]</td>
<td>521 57.1 [50.7,63.4]</td>
<td>42.9 [36.6,49.3]</td>
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<td>1,838 68.7 [64.9,72.3]</td>
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<td>Has a usual source of care</td>
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<td>Yes</td>
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<td>1,589 68.4 [64.9,71.6]</td>
<td>31.6 [28.4,35.1]</td>
<td>0.027</td>
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<tr>
<td>No</td>
<td>32.0 [28.5,35.8]</td>
<td>824 61.2 [54.6,67.4]</td>
<td>38.8 [32.6,45.4]</td>
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</table>

Ψ observations are weighted; sample allowed to float to accommodate small amounts of missing data.
<table>
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<tr>
<th>HIV Risk Behavior</th>
<th>Total Sample (n=2,414)</th>
<th>Ever tested for HIV</th>
<th>p-value</th>
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<tbody>
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<td>Col</td>
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<td>HIV Risk Behavior</td>
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<tr>
<td>High-risk behavior</td>
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<tr>
<td>No</td>
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<td>[34.5,39.9]</td>
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<tr>
<td>Any anal sex</td>
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<td>[2.4,4.6]</td>
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<tr>
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<td>[95.4,97.6]</td>
<td>2,318</td>
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<td>[0.2,1.7]</td>
<td>12</td>
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<tr>
<td>Insertive only</td>
<td>0.7</td>
<td>[0.4,1.2]</td>
<td>21</td>
</tr>
<tr>
<td>Both receptive and insertive</td>
<td>2.0</td>
<td>[1.3,3.1]</td>
<td>52</td>
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<tr>
<td>Injected drugs in past year</td>
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<td>[0.3,1.3]</td>
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<td>5+ partners in lifetime</td>
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<td>46.6</td>
<td>[43.3,50.0]</td>
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<td>[57.4,63.9]</td>
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*Observations are weighted; sample allowed to float to accommodate small amounts of missing data.*
Table 5.1a. Description of Sample by Race

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<th>NH White (n=1,217(^\dagger))</th>
<th>NH Black (n=544(^\dagger))</th>
<th>Hispanic (n=653(^\dagger))</th>
<th>(p)-value</th>
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<td>Col % 95% CI</td>
<td>Col % 95% CI</td>
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<tr>
<td><strong>Dependent Variable</strong></td>
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<tr>
<td>Tested in past year for HIV</td>
<td>29.1 [24.7,33.8]</td>
<td>51.3 [45.2,57.4]</td>
<td>34.1 [29.0,39.6]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>Sociodemographics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HH Income &lt; 200% FPL</td>
<td>36.4 [31.8,41.2]</td>
<td>58.4 [51.8,64.7]</td>
<td>59.4 [53.7,64.9]</td>
<td>&lt;0.001</td>
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<tr>
<td>FPL Gradient</td>
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</tr>
<tr>
<td>0-99% of Poverty Level</td>
<td>16.5 [13.5,20.1]</td>
<td>32.3 [25.4,40.0]</td>
<td>31.0 [25.8,36.9]</td>
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</tr>
<tr>
<td>300-399%</td>
<td>20.7 [16.9,25.1]</td>
<td>11.3 [7.7,16.2]</td>
<td>11.4 [7.9,16.1]</td>
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<tr>
<td>400-499%</td>
<td>11.0 [8.7,13.9]</td>
<td>6.7 [4.4,9.8]</td>
<td>4.9 [3.1,7.8]</td>
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<td>500+</td>
<td>13.5 [10.2,17.7]</td>
<td>2.7 [1.5,4.7]</td>
<td>5.3 [3.1,9.0]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>Age Group</strong></td>
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<tr>
<td>18-24</td>
<td>88.2 [85.7,90.4]</td>
<td>79.6 [74.3,84.0]</td>
<td>86.1 [81.9,89.4]</td>
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<tr>
<td><strong>Sexual minority</strong></td>
<td>2.7 [1.7,4.4]</td>
<td>2.5 [1.6,3.8]</td>
<td>3.1 [1.8,5.1]</td>
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<td><strong>Lives in an urban area</strong></td>
<td>29.1 [22.2,37.2]</td>
<td>57.4 [49.3,65.2]</td>
<td>42.8 [33.7,52.5]</td>
<td>&lt;0.001</td>
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<tr>
<td><strong>Homeless in past year</strong></td>
<td>1.3 [0.7,2.4]</td>
<td>1.3 [0.5,3.4]</td>
<td>1.4 [0.7,2.8]</td>
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<td><strong>HIV Risk Behavior</strong></td>
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</tr>
<tr>
<td>Any High-risk behavior</td>
<td>58.5 [54.5,62.3]</td>
<td>69.8 [64.9,74.2]</td>
<td>70.1 [65.4,74.4]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Any anal sex</td>
<td>3.3 [2.1,5.3]</td>
<td>2.9 [1.6,5.2]</td>
<td>3.6 [2.3,5.5]</td>
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<td>Receptive only</td>
<td>0.6 [0.1,3.0]</td>
<td>0.6 [0.2,1.8]</td>
<td>0.5 [0.1,2.1]</td>
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<tr>
<td>Insertive only</td>
<td>0.3 [0.2,0.7]</td>
<td>1.4 [0.6,3.2]</td>
<td>1.3 [0.5,3.2]</td>
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</tr>
<tr>
<td>Both receptive and insertive</td>
<td>2.4 [1.4,4.0]</td>
<td>0.9 [0.2,3.5]</td>
<td>1.9 [1.0,3.4]</td>
<td>0.24</td>
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<tr>
<td>Injected drugs in past year</td>
<td>0.8 [0.3,1.8]</td>
<td>0.9 [0.2,3.4]</td>
<td>0.0 [0.0,0.0]</td>
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<td>5+ partners in lifetime</td>
<td>41.5 [36.9,46.4]</td>
<td>60.5 [55.4,65.4]</td>
<td>50.6 [45.0,56.3]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Condom used at last vaginal sex</td>
<td>61.1 [56.7,65.3]</td>
<td>66.9 [61.2,72.1]</td>
<td>54.6 [48.4,60.8]</td>
<td>0.02</td>
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<td>Treated for an STI in past year</td>
<td>4.2 [2.9,5.9]</td>
<td>9.3 [6.4,13.4]</td>
<td>3.9 [2.4,6.1]</td>
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<td><strong>Healthcare access</strong></td>
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</tr>
<tr>
<td>Lacked health insurance the year</td>
<td>14.0 [10.7,18.1]</td>
<td>21.6 [16.5,27.8]</td>
<td>40.3 [34.8,46.2]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Has a usual source of care</td>
<td>75.2 [70.5,79.3]</td>
<td>60.1 [54.6,65.5]</td>
<td>53.4 [48.7,58.0]</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
\[\dagger\] Observations are weighted; sample allowed to float to accommodate small amounts of missing data.
Table 5.2. Model 1: Additive Approach to logistic regression of lifetime HIV test among males 15-24 (n=2,067)

<table>
<thead>
<tr>
<th></th>
<th>Model of Race &amp; Income only (n=2,414)</th>
<th>Full Model (n=2,067)</th>
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<td>ORs</td>
<td>95% CI</td>
</tr>
<tr>
<td><strong>Sociodemographics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NH White</td>
<td>REF</td>
<td></td>
</tr>
<tr>
<td>NH Black</td>
<td>2.48</td>
<td>(1.77 - 3.47)***</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1.22</td>
<td>(0.88 - 1.68)</td>
</tr>
<tr>
<td>HH Income &lt; 200% FPL</td>
<td>1.19</td>
<td>(0.92 - 1.54)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-17</td>
<td>REF</td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>2.15</td>
<td>(1.24 - 3.71)**</td>
</tr>
<tr>
<td>Identifies as a sexual</td>
<td>3.70</td>
<td>(1.68 - 8.15)**</td>
</tr>
<tr>
<td>minority</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lives in an urban area</td>
<td>0.94</td>
<td>(0.66 - 1.35)</td>
</tr>
<tr>
<td>Homeless in past year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lifetime incarceration</td>
<td>2.13</td>
<td>(1.45 - 3.11)***</td>
</tr>
<tr>
<td>HIV Behavior</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-risk sexual behavior</td>
<td>2.66</td>
<td>(1.93 - 3.65)***</td>
</tr>
<tr>
<td>Treated for an STI</td>
<td>4.04</td>
<td>(1.85 - 8.83)***</td>
</tr>
<tr>
<td>Healthcare access</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lacked health insurance the year prior</td>
<td>1.11</td>
<td>(0.72 - 1.70)</td>
</tr>
<tr>
<td>Usual Source of care</td>
<td>0.98</td>
<td>(0.65 - 1.45)</td>
</tr>
</tbody>
</table>

*p<0.05; **p<0.01; ***p<0.001
Table 5.3. Model 2: Logistic Regression of lifetime HIV test using an intersectional measure of race and SES among males 15-24 (n=2,067)

<table>
<thead>
<tr>
<th>RacexIncome</th>
<th>Interaction of race and income only (n=2,414)</th>
<th>Fully adjusted model (n=2,067)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (wtd)</td>
<td>ORs</td>
</tr>
<tr>
<td>NH White</td>
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<td></td>
</tr>
<tr>
<td>&gt;=200FPL</td>
<td>775</td>
<td>REF</td>
</tr>
<tr>
<td>&lt;200FPL</td>
<td>442</td>
<td>1.46</td>
</tr>
<tr>
<td>NH Black</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;=200FPL</td>
<td>218</td>
<td>3.34</td>
</tr>
<tr>
<td>&lt;200FPL</td>
<td>326</td>
<td>2.73</td>
</tr>
<tr>
<td>Hispanic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;=200FPL</td>
<td>255</td>
<td>1.46</td>
</tr>
<tr>
<td>&lt;200FPL</td>
<td>398</td>
<td>1.46</td>
</tr>
</tbody>
</table>

| Age         |          |      |           |      |           |
| 15-17       |          |      |           |      |           |
| 18-24       |          | 2.11 | (1.22 - 3.63)** |      |           |
| Identifies as a sexual minority |          | 3.56 | (1.64 - 7.72)** |      |           |
| Lives in an urban area |          | 0.93 | (0.65 - 1.33) |      |           |
| Lifetime incarceration |          | 2.06 | (1.42 - 3.00)** |      |           |
| HIV Behavior |          |      |           |      |           |
| High-risk sexual behavior |          | 2.72 | (1.98 - 3.72)** |      |           |
| Treated for an STI |          | 4.16 | (1.84 - 9.39)** |      |           |
| Healthcare access |          |      |           |      |           |
| Lacked health insurance the year prior |          | 1.10 | (0.72 - 1.71) |      |           |
| Usual Source of care |          | 0.97 | (0.66 - 1.44) |      |           |

* p<0.05; ** p<0.01; *** p<0.001
Table 5.4. Model 3: Logistic regression of lifetime HIV test among males 15-24 stratified by race

<table>
<thead>
<tr>
<th>Sociodemographic</th>
<th>NH Whites (n=1073)</th>
<th>NH Blacks (n=447)</th>
<th>Hispanics (n=547)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AORs 95% CI</td>
<td>AORs 95% CI</td>
<td>AORs 95% CI</td>
</tr>
<tr>
<td>HH Income &lt; 200% FPL</td>
<td>1.42 (0.93 - 2.18)</td>
<td>0.77 (0.40 - 1.49)</td>
<td>0.76 (0.45 - 1.29)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-17 REF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>1.82 (0.80 - 4.10)</td>
<td>3.12 (1.37 - 7.08)**</td>
<td>2.1 (0.71 - 5.91)</td>
</tr>
<tr>
<td>Identifies as a sexual minority</td>
<td>3.56 (1.23 - 10.35)*</td>
<td>3.12 (0.78 - 12.55)</td>
<td>4.0 (1.13 - 13.97)*</td>
</tr>
<tr>
<td>Lives in an urban area</td>
<td>0.77 (0.45 - 1.33)</td>
<td>1.56 (0.92 - 2.64)</td>
<td>0.9 (0.52 - 1.40)</td>
</tr>
<tr>
<td>Lifetime incarceration</td>
<td>2.08 (1.16 - 3.73)*</td>
<td>2.26 (1.10 - 4.66)*</td>
<td>1.9 (0.95 - 3.95)</td>
</tr>
<tr>
<td>HIV Behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-risk sexual behavior</td>
<td>3.93 (2.54 - 6.10)***</td>
<td>2.48 (1.33 - 4.65)**</td>
<td>1.1 (0.64 - 2.04)</td>
</tr>
<tr>
<td>Treated for an STI</td>
<td>2.37 (0.72 - 7.77)</td>
<td>5.22 (1.57 - 17.36)**</td>
<td>20.6 (6.79 - 62.3)***</td>
</tr>
<tr>
<td>Healthcare access</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lacked health insurance the year prior</td>
<td>1.18 (0.60 - 2.31)</td>
<td>0.96 (0.45 - 2.06)</td>
<td>1.2 (0.62 - 2.26)</td>
</tr>
<tr>
<td>Usual Source of care</td>
<td>0.74 (0.44 - 1.22)</td>
<td>1.18 (0.65 - 2.17)</td>
<td>1.5 (0.70 - 3.17)</td>
</tr>
</tbody>
</table>

* p<0.05; ** p<0.01; *** p<0.001
Chapter 5 References


35. LaVeist T. Why we should continue to study race...but do a better job: an essay on race, racism, and health. Ethnic Disparities. 1996;6:21-9.


CHAPTER SIX:

MANUSCRIPT 3

Gaps in service integration: Disparities in past-year HIV testing among male youth who receive STI services
Abstract

**Objective:** To examine whether race or income disparities exist in past-year HIV testing among youth who have received STI services.

**Methods:** Using cross-sectional data from the 2006-2010 wave of the National Survey of Family Growth (NSFG), this analysis uses a nationally representative sample of sexually experienced males ages 15 to 24 to assess disparities in past-year testing among those who report receiving STI treatment. Contrasts between additive and intersectional models are used to assess potential disparities in dual receipt of services.

**Results:** In the additive model, no race effects emerged, although when controlling for other possible confounders a lower likelihood of HIV testing for low-income youth was observed (AOR: 0.54, 95% CI: 0.31, 0.93). In the intersectional model, none of the race-income groups revealed any disparities in HIV testing, although older age was significantly associated with greater odds of past-year HIV testing. Stratified analyses reveal that the income effects noted in the additive model were specific to black males in our sample (AOR\textsubscript{NH Black}: 0.29, 95% CI: 0.12, 0.68) with no income effects identified among whites or Hispanics.

**Conclusions:** Results underscore the importance of exploring disparities in HIV testing using intersectional methods, as additive models of disparities obscure sub-population-specific effects. By examining our research question though multiple models, we discovered that model specification is critical to understanding potential points of intervention. Robust STI service provision plays a critical role in stemming the sexual transmission of HIV. This analysis points to gaps in care for low-income black youth who experience a disproportionate burden of HIV/AIDS related morbidity and mortality. Expanding integrated HIV testing at points of service that reach low-income black youth is essential given the disparities in testing noted for this population. Suboptimal rates of receipt of both STI and HIV services among all males in the sample also reinforce the importance of integrated universal, routine HIV testing for all those who appear for STI services. The integration of services creates programmatic synergies that optimize comprehensive care for people at risk of multiple sexually transmitted infections.
Background

Racial and ethnic disparities in HIV and AIDS diagnoses persist despite innovations in testing and treatment practices (1). Beginning with testing, engagement in the HIV care continuum (i.e. the stages of engagement in medical care that HIV-positive people go through, from diagnosis to viral suppression) (2) remains suboptimal for racial and ethnic minorities (3, 4). In addition, consistently low HIV testing rates among male youth (5-7) underscore the need to broaden HIV testing opportunities during the provision of other health services. This strategy is particularly important for those seeking STI testing and treatment whose risk for HIV infection is elevated (8).

The vertical integration of STI and HIV services provides people with access to comprehensive counseling, testing and treatment for STIs and HIV in a single location and/or visit. The integration of HIV testing with STI testing and treatment is well endorsed by the Centers for Disease Control and Prevention (9) and is a key strategy in the 2015 the National HIV/AIDS Strategy for the United States. The movement towards integrating these services is predicated on the logic that demand for STI services co-occurs with HIV risk (10). Risk behavior, such as injecting drugs or having unprotected sex, places an individual at risk for multiple infections (8, 11). Furthermore, the biological synergy between HIV and STIs accentuates the need to proactively test clients who receive services for one or the other. Considerable evidence supports the association between STIs and the acquisition and transmission of HIV through increased susceptibility and infectiousness (12). Certain types of STIs such as syphilis, herpes or chancroid produce genital ulcers which can facilitate easier entry of HIV; and general
inflammation from either ulcerative or non-ulcerative STIs (e.g., chlamydia, gonorrhea, and trichomoniasis) encourages the increased production of CD4 cells in genital secretions, which HIV targets. HIV-infected persons with STIs are also at greater risk of spreading HIV to others through increased cellular shedding of the HIV virus in genital secretions (12, 13). It is estimates that these biological mechanisms increase the risk of HIV infection from anywhere between 2 to 23 times, among those with co-occurring STIs (14, 15). In the same vein, effective treatment and syndromic management of STIs can reduce the risk of HIV transmission by as much as 38% (10, 16). Given their behavioral and biological overlap, the CDC recommends that HIV testing always be offered to individuals seeking STI testing and treatment services (17, 18).

Research on the integration of services remains extremely limited; however, extant data suggest that the degree of successful integration varies significantly based on the clinical context (19). Fitz-Harris et al. examined the level of program integration among CDC-funded HIV service programs across the United States. Using data from 2009 annual grantee reports, the authors found that 97% of grant recipients reported integrated STI and HIV testing services, suggesting that in publically funded clinics, integration of these services is strong. In contrast, Klein et al. examined provider rates of concurrent testing for STIs and HIV in an emergency department and found that only 28.3% of patients tested for syphilis, 3.8% tested for gonorrhea, and 3.8% tested for chlamydia were also tested for HIV during their visit, suggesting that despite gains in service integration initiatives, lags in integration across care settings still exist (20). Beyond these descriptive studies, very little is known about the integration of STI and HIV testing, or the degree to which racial and socioeconomic disparities may exist in the concomitant delivery of HIV
and STI services. In review of the literature, no papers were identified that addressed potential racial disparities in HIV and STI service integration. Because it is well-endorsed that prevention and treatment of these multiple infections should be addressed during the same visit, and because racial disparities in STI and HIV acquisition and engagement in care are well acknowledged, the lack of research on this issue remains a significant gap in our understanding of how to attenuate disparities in HIV care and treatment.

**Racial disparities in the use of STI services**

Population-level data confirm racial disparities in positive cases of STIs which points to disparities in STI acquisition and elevated demand for STI services among racial/ethnic minorities. It is important to note, however, that population-level data on the use of STI testing and treatment services is biased by reporting requirements, so what is known about STI service at the population level comes only from positive cases of STIs, not from the total number of people who have sought testing. To this end, private clinics are less consistent in reporting positive STI cases than publicly funded clinics (21); therefore, data on STI rates may be inflated for those who use publicly funded clinics; and because racial and ethnic minorities are more likely to use publicly funded clinics, data may overestimate racial disparities in STI incidence (21).

Because there is a dearth of evidence on potential disparities in the dual receipt of STI and HIV services, we turned to the broader literature on racial disparities in health service utilization and anchored our examination to racial disparities in STI testing where possible. Racial and socioeconomic disparities in the use of other health services have been described as individual level characteristics with structural roots (22). Most central to these drivers is the longstanding racism and oppression that people of color have
experienced, which have cascaded into myriad systems and microlevel factors that influence the use of health services in communities of color. Poverty (23), lack of a regular source of care and health insurance (24), inadequate and unsafe housing, distrust of the medical establishment (22), even the risk environment that disproportionately elevates STI acquisition and therefore the need for STI services (25, 26) have all been linked to how racial and ethnic minorities engage in health care. It does not take a significant leap of imagination to assume that these forces may also be at work in the use of STI and HIV services.

These factors also emerge in the literature as barriers to using STI services (22, 27-31). What’s missing, however, in much of the literature on STI services is an explicit connection between racial identity and socioeconomic status and barriers to service utilization. For example, although Geisler et al. noted that having health insurance was associated with a lower risk of chlamydia among sexually active young adults, racial and socioeconomic disparities are not examined (32). In a case-control study among black MSM in Jackson, MI, Dorell et al. examined factors associated with missed STI testing opportunities and found that lack of health insurance, lack of provider recommendation for testing and the absence of a usual source of care all influenced missed opportunities for testing (33). While more instructive, Dorell’s paper does not examine the potential of socioeconomic status to exert within-race effects on STI testing, nor does it compare across-race differences in factors associated with forgone testing.
Place of care has also been found to influence STI testing practices and racial and socioeconomic disparities in where individuals seek other healthcare services has been noted throughout the literature, with people of color and low-income individuals reporting use of public clinics, emergency rooms and acute care settings more often than higher income and white individuals (20, 22, 23, 34-37). What remains unclear, however, is whether multiple social identities of marginalization confer greater disparities in the use of these services.

Intersectional theorists have argued that an individual’s multiple social identities cannot be disentangled – that one cannot realistically parse out the effect of being a person of color from the effect of being poor in one’s lived experience. This omission in the literature undoubtedly masks critical nuances in our understanding of racial disparities in the HIV care continuum, beginning with testing. This analysis attends to the absence of evidence on racial disparities in the dual receipt of STI and HIV services by applying an intersectional framework to assess the effects of multiple marginalized statuses on past-year HIV testing among sexually experienced males who report receiving STI services.

Because of the longstanding recommendations to integrate HIV testing and point of STI services, the following analysis defines a gap in receipt of HIV testing among those who report receiving STI services as a gap in service integration, regardless of behavioral factors that may drive a person to seek testing services. This following analysis has two primary aims: 1) To describe the extent to which male youth report dual receipt of STI
and HIV services; and 2) to use intersectional methods to evaluate whether there are racial and socioeconomic disparities in the integration of services for adolescent males.

**Methods**

*Data Source and Sample*

Data for this analysis comes from the 2006-2010 National Survey of Family Growth, an ongoing household survey on reproductive health and family structure in the United States. The 2006-2010 wave of the NSFG included 10,403 men between the ages of 15-44 and oversamples youth, Hispanics, and non-Hispanic blacks.

**Study Sample: sexually experienced males ages 15-24**

There were several inclusion criteria for these analyses. First, males who reported ever having sexual intercourse with either a male or female were included. Respondents who answered yes to the following questions were considered sexually experienced and thus included in these analyses (n=8,738):

- *Have you ever had sexual intercourse?*
- *Has another male ever put his penis in your rectum or butt (anal sex)?*
- *Have you ever put your penis in his rectum or butt (anal sex)?*

The sample was further narrowed to non-Hispanic black, non-Hispanic white and Hispanic males. Race was measured using the 1997 OMB standards (38) which collapses multiracial groups into the category the respondent identifies most closely with. In the 2006-2010 NSFG, 492 of males (4.7%) reported more than one race. Each racial group excludes those who identify as Hispanic/Latino. Specifically, males who identified as a
single race (white or black) or identified as Hispanic were included (n=7,993). Those who identified as multiracial or other ethnicities were excluded from this analysis due to small sample size and lack of clarity in this category (n=745). The following questions are used to capture race and ethnicity in this analysis:

*Are you Hispanic or Latina, or of Spanish origin?*

*Which of the groups describe your racial background? (Please select one or more groups. Options include AI/AN, Asian, Native Hawaiian/Pacific Islander, Black or White)*

*Which of these groups best describe you? (Choose 1)*

All those who were older than 24 were also excluded (n=5,574). The sample was further narrowed to those who had explicitly stated “yes” or “no” for whether they had ever been tested for HIV outside of a blood donation; respondents with unknown or refused were excluded from these analyses to curtail underestimation of effects (n=5). Additionally, to be included in the analytic sample, youth included in the analysis had to answer yes to one of the following questions:

In the past 12 months, have you been tested by a doctor or other medical care provider for a sexually transmitted disease like gonorrhea, chlamydia, herpes, or syphilis?

In the past 12 months, have you been treated or received medication from a doctor or other medical care provider for a sexually transmitted disease like gonorrhea, chlamydia, herpes, or syphilis?

The sample was finally narrowed to a total sample of 612 youth.
Measures

Dependent variable

The dependent variable of interest is self-report of past-year HIV testing outside of blood donations. Respondents who report ever being tested were asked the month and year of their last test. Those who were unable to provide specific month and year were asked if they had been tested within the 12 months prior to the interview. Using both of these questions, a dichotomous variable was constructed with those who had not been tested in the past year as the reference group.

Independent variables

Race. In these analyses, we examined three race-ethnic groups: non-Hispanic white, non-Hispanic black, and Hispanic males. Race was measured using the 1997 OMB standards (38) which collapses multiracial groups into the category the respondent identifies most closely with. In the 2006-2010 NSFG, 492 of males (4.7%) reported more than one race. In this analysis, only 9 (1.47%) of the 612 report more than one race. Each racial group excludes those who identify as Hispanic/Latino. The following questions were used to capture race and ethnicity in this analysis:

1. Are you Hispanic or Latina, or of Spanish origin?
2. Which of the groups describe your racial background? (Please select one or more groups. Options include AI/AN, Asian, Native Hawaiian/Pacific Islander, Black or White)
3. Which of these groups best describe you? (Choose 1)

SES. We use household income as a proxy for socioeconomic status (39-41), which was calculated by the National Center for Health Statistics using self-reported combined family income from all sources, and total household size. In this analysis, participants <200% of FPL were considered low SES with those living in households with at least
200% of FPL were classified as higher SES (39). For the purposes of this study the SES variable was reverse coded so that lower income (theoretically access to fewer services) had a higher score and higher income (theoretically access to more resources and services) was given a lower score.

Measures of access

Three measures of health care access and utilization of care were included. Insurance coverage was constructed using two survey questions. Respondents were asked: In the past 12 months, was there any time that you did not have any health insurance or coverage? Those that answered “Yes” were asked, “In how many of the past 12 months were you without coverage?” In this analysis, those that had health insurance for at least part of the year were coded as the reference group, with those that lacked insurance for the entire year preceding the survey coded as “1”. Respondents were also asked whether they had a usual source of care. Those that did not were coded as the reference category. Finally, we control for where past-year STI services were received. Responses were classified into three groups: private or HMO offices (reference group); community/family planning/school or employee clinics; and acute care settings.

Additional control variables

Age is included as a dichotomized grouping of 15-17 year olds and 18-24 year olds. Sexual identity is also included in this analysis, though the small sample size prohibited its inclusion in the full multivariate model. Respondents were asked to self-report their identity in the NSFG during the ACASI portion of the interview. Possible responses include “heterosexual or straight”, “homosexual or gay”, bisexual, or “something else”.

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Because of small sample sizes, we generated a dichotomous variable that indicates whether a respondent identified as a sexual minority (gay or bisexual). **Place of residence** was dichotomized from three original categories: non-metro area, greater metro area and central city. Those who live in a non-metro or greater metro area were appointed as the reference group for those who report living in central city. **Housing status** was also included in descriptive and bivariate analyses, though was excluded in the multivariate models due to limited sample size. Respondents who report having stayed in a shelter at any point in the year prior to the survey were coded as unstably housed.

**Sexual risk behavior** was also included in this analysis. Because sexual risk behaviors were not the primary focus on this analysis, a single measure of any high-risk behavior was included. This metric includes the following STI/HIV risk factors: 1) lifetime report of anal sex 2) no condom use at last vaginal sex, 3) total number of sex partners in lifetime (dichotomized at >=5), and 4) past-year injection drug use.
Analysis

Preparatory analyses were performed to examine the missingness of explanatory variables. Exploratory analyses examined the distribution and prevalence of past-year HIV testing. Bivariate tests of association between past-year HIV testing and each of the independent variables were conducted using Wald Log-Linear Chi Square tests for clustered survey data.

In step with Aim 2 (Chapter 5), this analysis applies Veenstra’s analytic methods (42). In the first model, a traditional additive approach is tested using multivariate logistic regression. Models 2 and 3 consider an intersectional approach to assess disparities in testing. In Model 2, combined measures of race and SES using factor variables assess the conjoint salience of race and income in past-year HIV testing. Model 3 examines within-race effects of income using stratified analyses. We use these three models to answer the following questions:

1. Among those who have received STI services, are disparities in past-year HIV testing present among those with marginalized identities (as measured by race and low SES)? [Model 1; additive]

2. To what extent does an intersectional model of race and SES explain disparities in the dual receipt of services beyond that already explained by an additive model? [Model 2; intersectional]

3. To what extent do stratified models by race identify heterogeneity of within-race income effects on dual receipt of services? [Model 3; intersectional]
4. To what extent do other social and behavioral determinants influence past-year HIV testing among youth who have received STI services? [Models 1, 2 and 3]

Three possible outcomes are anticipated in these analyses: 1) race and income will exert independent effects on past-year HIV testing (i.e. race and income will both be associated with past-year HIV testing with youth of color and low income youth less likely to report HIV testing). To assess this, the strength and direction of the main effects of race and SES are assessed with respect to the principles of simultaneity and directionality (43). Simultaneity reflects the assumption that race and SES will be significantly associated with past-year HIV testing independently and after controlling for one another. Directionality suggests that youth of color and low SES youth will exhibit lower likelihood of receiving an HIV test. The second anticipated outcome is tested in Model 2 (the intersectional model), which we expect will illustrate heightened disparities among those with multiple marginalized identities (i.e. AORs for low-income youth of color will be even smaller than those in Model 1); Factor variables which generate each combination of race-SES group membership (e.g. high-income whites, low-income whites, high-income blacks, etc.) are used to assess this hypothesis. Finally, we expect that Model 3 will uncover income effects across racial groups. To assess within-race income differences in past-year HIV testing, this final model presents additive logistic regression models stratified by race.

Logistic regression was used for all models. Simple tests of main effects were first conducted to examine the unadjusted odds of past-year testing for each independent
variable. Significance was set at 0.05 for multivariate models. Sensitivity analyses were conducted for survey year and household income to ensure the cut point used (i.e. 200%) was robust to alternate specifications (i.e. 100% FPL).

Sample size floated to accommodate small amounts of missing data in bivariate tests. In multivariate analyses, complete case analysis was used (n=511) and multiple imputation methods were then applied (n=612) to check for any bias in complete case estimates. Sensitivity tests were also completed on a sample that excluded sexual minorities (n=31) to determine their level of influence on model estimates. Multiple imputation (44) was used to assess the possible biases in the complete case method used in multivariate analyses. All post-host sensitivity tests can be found in the Appendix. All analyses were conducted using STATA 12 using the “svy:” command series to account for survey design. To provide reliable estimates of the target populations, descriptive statistics were weighted based upon the weighting scheme suggested by the NSFG.

**Ethical Approval**

Prior to data collection the NSFG was reviewed and approved by the National Center for Health Statistics (NCHS) IRB. During data collection, informed consent was obtained from every study participant. Minors were required to have the signed consent of parents before being asked for their own signed assent. Previous to its release, the NSFG data were stripped of personal identifiers. The Institutional Review Boards at Johns Hopkins Bloomberg School of Public Health in Baltimore, Maryland reviewed and approved this research as exempt.
Results

Sample characteristics and prevalence of past-year HIV testing

Table 6.1 shows the description of the sample by past-year testing history. Of the 612 males who received STI testing or treatment services in the past year, only 59.6% report receiving an HIV test. Overall, the sample is mostly white males (51.8%), above the age of 17 (86%) who live in households with income above 200% FPL (54.3%). The vast majority (75%) of the sample reports at least one high-risk behavior. Bivariate differences in testing history emerged for age (p=0.029), sexual identity (p=0.003) and homelessness (p=0.003), although no racial (p=0.29) or socioeconomic (p=0.12) differences were observed.

Tables 6.1a displays descriptive statistics by race. Significant racial differences in income, place of residence and health care coverage are present, with more than half of black and Hispanic youth identifying as low SES (55.6 and 56%, respectively) in contrast to 36% of whites. The majority of black youth (63.6%) live in a metro city center, while only 45.4% of Hispanic and 36.2% of white youth live in an urban area. More than one third of Hispanic youth report lacking health insurance for the entire year prior to the survey as do one in five black male youth. Only 10.8% of white youth report lacking insurance.

Model 1: Additive model

Table 6.2 illustrates the additive model used to assess the correlation between race, SES and past-year HIV testing. Column 1 reports the unadjusted odds ratios of race and income, neither of which displays an independent association with past-year testing. In
the full multivariate model, however, low-income youth emerge as less likely to receive an HIV test when controlling for other possible confounders (AOR: 0.54, 95% CI: 0.31, 0.93). Household income is the only explanatory variable in the full model that is significantly associated with past-year HIV testing.

**Model 2: Race-SES intersection**

Table 6.3 displays the intersectional model. In the model with just the interaction of race and income, none of the race-income groups emerge as statistically significant, and even when controlling for confounders in the full model, none of the race-income groups were statistically significantly associated with the outcome. Age, was the only covariate significantly associated with HIV testing in the full multivariate model, with 18-24 year olds more likely than 15-17 year olds to receive an HIV test in the past year (AOR: 2.18, 95%CI: 1.01, 4.71).

**Model 3: Race-stratified models**

Stratified multivariate logistic regressions were run to explore the within-racial group effect of income on past-year testing. Results are displayed in Table 6.4. Low-income black males were significantly less likely than higher income black males to receive an HIV test in the past year (AOR:0.29; 95%CI: 0.12-0.68). No income effects were notes for non-Hispanic white males (AOR:0.99; 95%CI: 0.38-2.55) or Hispanic males (AOR:0.44; 95%CI: 0.11-1.76). This was the only variable of all three stratified analyses to emerge as highly significant (p<0.01).
Post-hoc sensitivity analyses

Sensitivity analyses were conducted to assess potential effects of survey year, sample selection, income cut-point and complete case approach. In bivariate tests of survey year with the outcome, no differences were found (see Table A6.3 in Appendix). In tests of income cut point, estimates for higher income Hispanic male youth were affected in the race-income model (OR: 1.96, 95%CI: 1.01, 3.83). In the full multivariate model, within-income race affects are robust to the income specification. In assessing whether or not our estimates were sensitive to male youth who identified as sexual minorities, sensitivity analyses indicated no influence on model estimates in unadjusted model; however, estimates for higher income blacks became significant (AOR: 1.99, 95%CI: 1.00, 5.64). Multivariate estimates of age were attenuated.

Discussion

This paper applied intersectional methods to examine whether racial or socioeconomic disparities affected the receipt of HIV testing services among youth who receive STI services. In the traditional additive model, racial disparities in testing were not observed; however, income effects were. Moreover, SES was the only significant predictor in the model, suggesting that low-income youth who seek STI treatment are less likely to receive an HIV test in the past year compared to higher income youth, holding other factors constant. In the intersectional model, income effects on past-year testing disappeared. Instead the only significant factor associated with testing was age, with older youth (ages 18-24) more likely than 15-17 year olds to report past-year testing. The final race-stratified model presents yet another story and emerges to elevate a critical
detail in the provision of HIV and STI services: the income effects observed in the first model do not affect all racial groups equally. Instead, our race-stratified analyses suggest that low-income black males are disproportionately missed in the dual receipt of HIV and STI services, while no such income effects are observed for non-Hispanic white and Hispanic male youth.

By examining the effects of race and income through multiple models, we were able to see how model specifications may mute sub-group effects, or generalize them to the entire sample. If we had stopped with only the additive model, or the interactive model, we would have failed to note the within-race effects of income, which are distinctively instructive on how to close the gap in HIV testing disparities. Although testing rates are known to be higher among black men, this finding adds the novel detail that, among youth who access STI care, report of HIV testing is significantly lower among low income black males. That poverty remains a significant barrier to accessing healthcare services for black men, is supported in the literature (22); however, these findings do not clarify whether this disparity is driven by individual behavior or barriers to care, or whether there are system and provider biases that contribute to within-race income disparities among black men in our sample. Nevertheless, if dual receipt of STI services and HIV testing is affected by income status for black male youth, health care providers are missing the opportunity to test and treat infections in a subpopulation that is disproportionately affected by HIV acquisition. As a consequence, suboptimal HIV testing among low-income black male youth who seek STI services may be contributing to overall racial disparities in HIV infection.
As a secondary aim in this analysis, we set out to describe the degree of service overlap between STI and HIV testing among a group of male youth. We found that fewer than 60% of those who received STI testing or services also received an HIV test in the past year, underscoring the suboptimal level of vertical integration between STI and HIV services among our sample. Given the longstanding recommendations for the integration of these services, we expected to see most youth in this sample reporting receipt of both, despite possible behavioral factors that might be at play. The rates of STI and HIV infection among youth as well as makes this finding particularly alarming. Historical and current trends in funding and surveillance have likely contributed to this gap in services (45).

While this paper brings forth critical findings about gaps in integration and intersectional differences in the receipt of HIV testing among STI service users, several limitations must be noted. Because this analysis draws on preexisting survey data, the questions were not optimally designed with this research question in mind. We relied on retrospective questions about service use within the past 12 months, which are always subject to recall bias. Those with more recent encounters may recall services they received with more detail. Further, the structure of the survey questions regarding STI services and HIV testing does not confirm whether they were co-located or whether youth received both at the same time. However, given the existing recommendations at the time of data collection that services should be provided during the same visit, this assumption is the closest approximation available to conduct these analyses. Additionally, the questions
asked about STI and HIV testing are sensitive in nature and some youth may not be as comfortable disclosing receipt of such services during an interview. Although ACASI was used, social desirability bias is also a consideration. It is not possible to say whether these biases would have had an influence on the effects observed in our analyses, nor which direction estimates may be pulled by such biases. Our sample size also prevented us from including a number of covariates in the full model; for example, homelessness and sexual orientation. Finally, this analysis does not parse out whether disparities in past-year testing among those seeking services precede behavioral drivers that spur service use or whether there are systems and provider-side disparities that influence inconsistent provision of HIV testing during receipt of STI services.

AIDS deaths have declined the least for men and women of color in the antiretroviral therapy (ART) era (46). Minority youth are particularly impacted, with the lowest probabilities of viral suppression and highest probability of viral rebound occurring among black MSM youth (47). The costs of these disparities are non-trivial as they cascade into persistent racial and socioeconomic disparities in AIDS-related morbidity and mortality (48). Robust STI service provision plays a critical role in stemming the sexual transmission of HIV. This analysis points to gaps in care for low-income black youth and reinforces the importance of integrated universal, routine HIV testing for all those who appear for STI services. Although integration can be challenging and adherence to recommendations for concurrent STI and HIV testing is still inconsistent across care settings, when successful, the integration of services creates programmatic synergies that optimize comprehensive care for people at risk of multiple sexually
transmitted infections. Systems interventions include improving training of front line staff and increasing the flexibility of funding, as well as targeting and expanding integrated HIV testing at points of service that reach low-income black youth.
### Chapter 6 Figures and Tables

**Table 6.1. Description of Sample by Past-year HIV Testing History among youth 15-24 who have received STI services (n=614)**

<table>
<thead>
<tr>
<th></th>
<th>Total Sample (n=614)</th>
<th>Tested in past year for HIV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Col %</td>
<td>95% CI</td>
</tr>
<tr>
<td>Tested in past year</td>
<td>59.6</td>
<td>[53.3, 65.6]</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NH White</td>
<td>51.8</td>
<td>[45.1, 58.4]</td>
</tr>
<tr>
<td>NH Black</td>
<td>28.9</td>
<td>[23.3, 35.2]</td>
</tr>
<tr>
<td>Hispanic</td>
<td>19.3</td>
<td>[14.7, 25.0]</td>
</tr>
<tr>
<td><strong>HH Income &lt; 200% FPL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FPL Gradient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-99% of Poverty Level</td>
<td>24.1</td>
<td>[19.1, 29.9]</td>
</tr>
<tr>
<td>100-199%</td>
<td>21.7</td>
<td>[17.6, 26.3]</td>
</tr>
<tr>
<td>200-299%</td>
<td>15.7</td>
<td>[11.5, 21.0]</td>
</tr>
<tr>
<td>300-399%</td>
<td>19.7</td>
<td>[15.1, 25.3]</td>
</tr>
<tr>
<td>400-499%</td>
<td>7.9</td>
<td>[5.3, 11.6]</td>
</tr>
<tr>
<td>500+</td>
<td>11.0</td>
<td>[7.2, 16.6]</td>
</tr>
<tr>
<td><strong>Age Group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-17</td>
<td>13.5</td>
<td>[10.2, 17.5]</td>
</tr>
<tr>
<td>18-24</td>
<td>86.5</td>
<td>[82.5, 89.8]</td>
</tr>
<tr>
<td><strong>Sexual minority</strong></td>
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<td>[2.9, 8.7]</td>
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<tr>
<td>No</td>
<td>41.9</td>
<td>[35.7, 48.4]</td>
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<tr>
<td><strong>Homeless in past year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.9</td>
<td>[0.8, 4.7]</td>
</tr>
<tr>
<td>No</td>
<td>41.1</td>
<td>[35.0, 47.4]</td>
</tr>
<tr>
<td><strong>High-risk behavior</strong></td>
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<td></td>
</tr>
<tr>
<td>Yes</td>
<td>74.8</td>
<td>[70.0, 79.1]</td>
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<tr>
<td>No</td>
<td>49.3</td>
<td>[35.5, 63.1]</td>
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<tr>
<td><strong>Lacked health insurance the year prior</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>18.3</td>
<td>[13.7, 24.0]</td>
</tr>
<tr>
<td>No</td>
<td>41.6</td>
<td>[35.5, 47.9]</td>
</tr>
<tr>
<td><strong>Has a usual source of care</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>71.8</td>
<td>[65.3, 77.5]</td>
</tr>
<tr>
<td>No</td>
<td>34.8</td>
<td>[24.3, 47.0]</td>
</tr>
<tr>
<td><strong>Lives in an urban area</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>45.9</td>
<td>[38.9, 53.1]</td>
</tr>
<tr>
<td>No</td>
<td>39.7</td>
<td>[31.5, 48.6]</td>
</tr>
<tr>
<td><strong>Where services were received</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private or HMO Office</td>
<td>47.1</td>
<td>[40.5, 53.9]</td>
</tr>
<tr>
<td>Community/FP/School/Employer clinic</td>
<td>39.8</td>
<td>[33.9, 45.9]</td>
</tr>
<tr>
<td>Acute care setting</td>
<td>13.1</td>
<td>[9.0, 18.6]</td>
</tr>
</tbody>
</table>

*Observations are weighted; sample allowed to float to accommodate small amounts of missing data.*
### Table 6.1a. Description of Sample by Race

<table>
<thead>
<tr>
<th></th>
<th>NH White (n=243)</th>
<th>NH Black (n=221)</th>
<th>Hispanic (n=148)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested in past year for HIV</td>
<td>57.8 [48.0,67.0]</td>
<td>57.2 [46.2,67.5]</td>
<td>68.3 [59.0,76.3]</td>
<td>0.294</td>
</tr>
<tr>
<td>HH Income &lt; 200% FPL</td>
<td>36.4 [27.0,47.1]</td>
<td>55.6 [44.0,66.6]</td>
<td>56.0 [45.1,66.4]</td>
<td>0.009</td>
</tr>
<tr>
<td><strong>Poverty Level</strong></td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>0-99% of Poverty Level</td>
<td>16.7 [9.9,26.9]</td>
<td>31.3 [21.9,42.7]</td>
<td>33.0 [24.7,42.5]</td>
<td></td>
</tr>
<tr>
<td>100-199%</td>
<td>19.7 [14.6,26.1]</td>
<td>24.2 [16.8,33.6]</td>
<td>23.0 [16.0,32.0]</td>
<td></td>
</tr>
<tr>
<td>200-299%</td>
<td>10.2 [5.5,18.3]</td>
<td>23.6 [14.8,35.4]</td>
<td>18.4 [10.8,29.6]</td>
<td></td>
</tr>
<tr>
<td>300-399%</td>
<td>25.0 [17.9,33.8]</td>
<td>13.8 [7.6,23.8]</td>
<td>14.3 [7.3,26.2]</td>
<td></td>
</tr>
<tr>
<td>400-499%</td>
<td>11.4 [6.6,19.0]</td>
<td>5.7 [3.1,10.5]</td>
<td>1.8 [0.5,6.7]</td>
<td></td>
</tr>
<tr>
<td>500+</td>
<td>17.0 [10.6,26.1]</td>
<td>1.3 [0.4,5.0]</td>
<td>9.4 [3.7,21.8]</td>
<td></td>
</tr>
<tr>
<td><strong>Age Group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>88.4 [83.0,92.3]</td>
<td>81.6 [73.4,87.7]</td>
<td>88.9 [80.7,93.9]</td>
<td>0.141</td>
</tr>
<tr>
<td><strong>Sexual Minority</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homeless in past year</td>
<td>2.2 [0.6,8.0]</td>
<td>1.9 [0.4,8.1]</td>
<td>1.0 [0.3,4.0]</td>
<td>0.756</td>
</tr>
<tr>
<td>High-risk behavior</td>
<td>75.2 [67.1,81.9]</td>
<td>73.8 [65.5,80.7]</td>
<td>75.3 [60.0,86.1]</td>
<td>0.968</td>
</tr>
<tr>
<td>Lives in an urban area</td>
<td>36.2 [25.5,48.5]</td>
<td>63.6 [55.0,71.4]</td>
<td>45.4 [31.0,60.6]</td>
<td>0.003</td>
</tr>
<tr>
<td>Lacked health insurance the year prior</td>
<td>10.8 [5.7,19.6]</td>
<td>20.0 [13.0,29.3]</td>
<td>34.9 [22.7,49.6]</td>
<td>0.002</td>
</tr>
<tr>
<td>Has a usual source of care</td>
<td>74.8 [63.5,83.4]</td>
<td>63.5 [55.6,70.7]</td>
<td>76.3 [67.2,83.5]</td>
<td>0.107</td>
</tr>
<tr>
<td>Where services were received</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private or HMO Office</td>
<td>53.4 [43.7,62.8]</td>
<td>36.7 [26.2,48.7]</td>
<td>46.2 [32.9,60.1]</td>
<td></td>
</tr>
<tr>
<td>Community/FP/School/</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employer clinic</td>
<td>35.8 [27.3,45.3]</td>
<td>44.4 [35.2,53.9]</td>
<td>43.6 [30.5,57.7]</td>
<td></td>
</tr>
<tr>
<td>Acute care setting</td>
<td>10.9 [5.8,19.5]</td>
<td>18.9 [12.7,27.2]</td>
<td>10.2 [4.9,20.1]</td>
<td>0.125</td>
</tr>
</tbody>
</table>

*Observations are weighted; sample allowed to float to accommodate small amounts of missing data.*
Table 6.2. Model 1: Additive Approach to logistic regression of past-year HIV test among males 15-24 who have received STI testing or treatment services

<table>
<thead>
<tr>
<th></th>
<th>Model of Race &amp; Income only (n=612)</th>
<th>Full Model (n=511)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ORs 95% CI</td>
<td>AORs (^a) 95% CI</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NH White</td>
<td>REF</td>
<td>REF</td>
</tr>
<tr>
<td>NH Black</td>
<td>1.06 (0.58 - 1.94)</td>
<td>1.09 (0.57 - 2.08)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1.72 (0.96 – 3.11)</td>
<td>1.80 (0.77 - 4.20)</td>
</tr>
<tr>
<td>HH Income &lt; 200FPL</td>
<td>0.63 (0.38 – 1.07)</td>
<td><strong>0.54 (0.31 - 0.93)</strong></td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-17</td>
<td></td>
<td>REF</td>
</tr>
<tr>
<td>18-24</td>
<td>2.05 (0.92 - 4.57)</td>
<td></td>
</tr>
<tr>
<td><strong>High-risk sexual behavior</strong></td>
<td>1.38 (0.72 - 2.63)</td>
<td></td>
</tr>
<tr>
<td><strong>Lacked health insurance the year prior</strong></td>
<td>1.02 (0.42 - 2.50)</td>
<td></td>
</tr>
<tr>
<td><strong>Usual Source of care</strong></td>
<td>0.71 (0.35 - 1.42)</td>
<td></td>
</tr>
<tr>
<td><strong>Lives in an urban area</strong></td>
<td>0.99 (0.52 - 1.86)</td>
<td></td>
</tr>
<tr>
<td><strong>Place of care</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private or HMO Office</td>
<td>REF</td>
<td></td>
</tr>
<tr>
<td>Community/FP/School/Employee clinic</td>
<td>1.59 (0.85 - 2.98)</td>
<td></td>
</tr>
<tr>
<td>Acute care setting</td>
<td>1.87 (0.84 - 4.16)</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) p<0.05; \(^{**}\) p<0.01; \(^{***}\) p<0.001
Table 6.3. Model 2: Logistic Regression of past year HIV test using an intersectional measure of race and SES among males 15-24 who have received STI testing or treatment services

<table>
<thead>
<tr>
<th>RacexIncome</th>
<th>Interaction of race and income only (n=612)</th>
<th>Fully adjusted model (n=511)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N (wtd)</td>
<td>ORs 90% CI</td>
<td>ORs 90% CI</td>
</tr>
<tr>
<td>NH White &gt;=200FPL</td>
<td>145 REF 0.88 (0.40 - 1.96) 0.92 (0.40 - 2.12)</td>
<td></td>
</tr>
<tr>
<td>NH White &lt;200FPL</td>
<td>99 1.46 (0.63 - 3.38) 2.00 (0.90 - 4.45)</td>
<td></td>
</tr>
<tr>
<td>NH Black &gt;=200FPL</td>
<td>87 0.66 (0.32 - 1.36) 0.55 (0.24 - 1.23)</td>
<td></td>
</tr>
<tr>
<td>NH Black &lt;200FPL</td>
<td>135 2.53 (0.94 - 6.87) 2.81 (0.73 - 10.77)</td>
<td></td>
</tr>
<tr>
<td>Hispanic &gt;=200FPL</td>
<td>47 1.06 (0.51 - 2.20) 1.05 (0.43 - 2.56)</td>
<td></td>
</tr>
<tr>
<td>Hispanic &lt;200 FPL</td>
<td>101 REF 2.18 (1.01 - 4.71)*</td>
<td></td>
</tr>
</tbody>
</table>

Age

<table>
<thead>
<tr>
<th>Age</th>
<th>N (wtd)</th>
<th>ORs 90% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-17</td>
<td>18-24</td>
<td>2.18 (1.01 - 4.71)*</td>
</tr>
<tr>
<td>High risk behavior</td>
<td>1.38 (0.73 – 2.6)</td>
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</tr>
<tr>
<td>Lacked health insurance the year prior</td>
<td>0.92 (0.37 - 2.29)</td>
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</tr>
<tr>
<td>Usual Source of care</td>
<td>0.73 (0.38 - 1.42)</td>
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</tr>
<tr>
<td>Lives in an urban area</td>
<td>1.05 (0.56 - 1.96)</td>
<td></td>
</tr>
<tr>
<td>Place of care</td>
<td>REF</td>
<td></td>
</tr>
<tr>
<td>Private or HMO Office</td>
<td>1.62 (0.86 - 3.06)</td>
<td></td>
</tr>
<tr>
<td>Community/FP/School/Employer clinic</td>
<td>2.02 (0.89 - 4.59)</td>
<td></td>
</tr>
</tbody>
</table>

*p<0.05; ** p<0.01; *** p<0.001
Table 6.4 Logistic regression of past-year HIV test among males 15-24 stratified by race

<table>
<thead>
<tr>
<th></th>
<th>NH Whites (n=206)</th>
<th>NH Blacks (n=189)</th>
<th>Hispanics (n=128)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Full Model AORs(^a)</td>
<td>95% CI</td>
<td>Full Model AORs(^a)</td>
</tr>
<tr>
<td>HH Income &lt; 200% FPL</td>
<td>0.986 (0.38 - 2.55)</td>
<td><strong>0.29 (0.12 - 0.68)</strong></td>
<td>0.44 (0.11 - 1.76)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-17</td>
<td>REF</td>
<td>REF</td>
<td>REF</td>
</tr>
<tr>
<td>18-24</td>
<td>1.78 (0.63 - 4.93)</td>
<td>2.77 (0.90 - 8.59)</td>
<td>0.93 (0.23 - 3.75)</td>
</tr>
<tr>
<td><strong>High risk behavior</strong></td>
<td>1.76 (0.70 - 5.31)</td>
<td>1.65 (0.67 - 4.09)</td>
<td>0.48 (0.16 - 1.41)</td>
</tr>
<tr>
<td>Received care in an acute care setting</td>
<td>5.35 (0.99 - 29.02)</td>
<td>1.93 (0.73 - 5.11)</td>
<td>0.37 (0.10 - 1.42)</td>
</tr>
</tbody>
</table>

* p<0.05; ** p<0.01; *** p<0.001
Chapter 6 References


35. Lanier Y, Sutton MY. Reframing the context of preventive health care services and prevention of HIV and other sexually transmitted infections for young men: new


CHAPTER SEVEN:

CONCLUSION
Summary of findings

The primary aim of this dissertation is to inform both public health interventions and research that work to attenuate disparities in the HIV care continuum. Recent investments in understanding the structural impacts of racism and poverty on HIV infection have yet to translate to understanding disparities in HIV testing among minority populations, and youth in particular. This dissertation offers a step in this direction. Collectively, the three analyses in this dissertation build upon three key premises: one, that microlevel measures of social identity can and do reflect structural forces of inequality (Aim 1); two, that individual level markers of social identity are not only proxies for structural inequality, but also map onto the use of health services such as HIV testing (Aims 2 and 3); and three, that individual measures of identity are intersectional and must be modeled accordingly in order to target sub-group dynamics (Aims 2 and 3). In contrast to prior research that explores disparities in HIV testing, the intersectional approach adopted in this dissertation questions the autonomous contribution of race and income and whether it masks underlying disparities in a critical aspect of the HIV care continuum. The following sections summarize the key findings and conclusions of each aim, reviews the strengths and the limitations of this dissertation, and is followed by an overall assessment of the implications of this work.

Chapter 4 (Aim 1)

The aim of Chapter 4 was to qualitatively investigate the way in which social context, and by extension, the structural context of HIV risk, operates through racial and gender identities among urban black male youth. Narratives of racial identity stirred themes of internalized and perceived racism and aspirations of manhood were bound by macro
influences of economic disenfranchisement and social role absenteeism. Findings suggest that identity development among African American adolescent males may involve constructing a positive sense of self while discrediting or differentiating themselves from negative stereotypes attributed to their ethnic/racial group membership. These narratives highlight the systemic oppression that converges at the unique intersection of race and gender for black men in the U.S.

**Chapter 5 (Aim 2)**

The aim of Chapter 5 was to examine racial and socioeconomic disparities in lifetime report of HIV testing among a nationally representative sample of sexually experienced male youth 15 to 24 years of age. Using cross-sectional data from the 2006-2010 wave of the National Survey of Family Growth (NSFG), this analysis contrasts additive and intersectional models to assess disparities in lifetime testing among 2,414 sexually experienced black, white and Hispanic males between 15-24 years of age. Results highlighted a greater likelihood of HIV testing for black male youth compared to non-Hispanic whites, as well as within-income racial differences with higher-income Hispanic youth who were more likely to report HIV testing than higher-income non-Hispanic white youth. Stratified analyses revealed no within-race income effect, although within-race analyses highlighted other socio-structural factors that are inconsistently associated with HIV testing across racial groups. The application of an intersectional analytic model uncovered critical distinctions in sub-group factors related to HIV testing that would have been missed in a traditional unitary approach.
Chapter 6 (Aim 3)

Aim 3 assessed whether intersectional disparities exist in past-year HIV testing among youth who have received STI services. As a secondary aim, this paper explored the degree to which all male youth who sought STI services also received an HIV test in the past year. Contrasts between additive and intersectional models were used to assess potential disparities in dual receipt of services. In the additive model, no race effects emerged, although when controlling for other possible confounders a lower likelihood of HIV testing for low-income youth was observed (AOR: 0.54, 95% CI: 0.31, 0.93). In the intersectional model, none of the race-income groups revealed any disparities in HIV testing. Stratified analyses revealed that the income effects noted in the additive model were specific to black males in our sample (AOR: 0.29, 95% CI: 0.12, 0.68).

While the primary finding of this analysis is the gap in care for low-income black youth, this paper also reinforces the suboptimal rates of past-year testing for all youth in the sample. Robust STI service provision plays a critical role in stemming the sexual transmission of HIV. The integration of services creates programmatic synergies that optimize comprehensive care to people at risk of multiple sexually transmitted infections. Expanding integrated universal, routine HIV testing for all those who appear for STI services is essential, as is integrating testing at points of service that reach low-income black youth, given the disparities in testing noted for this population.
Overall summary of findings

The results from all three analyses emphasize the importance of exploring disparities in HIV testing using a mixed methods intersectional approach. Qualitative findings underscore how structural influences of inequality and oppression manifest at the individual level and emphasizes how essential an intersectional frame is in understanding health-seeking behavior among men of color. To assess disparities in health seeking behavior (such as HIV testing) along a single axis such as race or gender obscures the unique barriers and challenges experienced at the intersection of gender and race for young black men. Additionally, these findings provide clear guidance for the subsequent quantitative analyses, supporting the centrality and use of individual measures of race and class in quantitative models of intersectional disparities.

Quantitative results underscore the importance of exploring disparities in HIV testing using intersectional models, as additive models of disparities obscure sub-population-specific effects. By examining our research questions through multiple models, we discovered that model specification is critical to understanding potential points of intervention to improve access to and uptake of HIV testing among male youth of color. As structural approaches to HIV risk reduction continue to gain traction, ongoing efforts will be maximized if they integrate social identity theory, intersectionality and the way in which structural disparities influence microlevel behavior.
Strengths and limitations

While this dissertation surfaces critical findings about social identity and intersectional differences in the receipt of HIV testing among male youth, the following strengths and limitations bear consideration.

One of the key strengths of this dissertation’s is its mixed methods application of intersectionality which harnesses the respective strengths of qualitative narratives and the power of a large, nationally representative data set. Qualitative methods are, by far, the most frequently used tools in intersectional research as they inherently attend to the complexity and depth of people’s lived experiences. By using these methods, this dissertation was able to ground the quantitative analyses in rich narrative of how power and oppression may shape social identity and health-seeking behavior.

Building off of the qualitative scaffolding in Aim 1, Aims 2 and 3 use a large, nationally representative sample of youth, permitting broader generalizability than is found in small, community-based samples that have generally been used to examine racial disparities in HIV testing. Additionally, the NSFG over sampled youth as well as black and Hispanic populations, allowing for more robust analyses of these subpopulations, including the ability to explore intersectional analyses with sufficient sample size.

Despite the strengths of these methods, several limitations bear consideration. The narratives from African American adolescent youth we interviewed in Baltimore city are not necessarily representative of African American male youth in other social or
geographic contexts. Additionally, our sample was limited to low or middle SES males and therefore may not extend to higher SES young black men. Additionally, the data for both quantitative aims are cross-sectional and therefore no causal inferences can be made about the associations (or lack thereof) observed. It is possible, to this end, that HIV testing occurred prior to other risk behaviors or sociodemographic factors, including household income, which can fluctuate over time.

All three aims also relied on secondary data which limited the scope of what could be explored within the frame of this dissertation. Data used for Aim 1 was nested within a larger study of which social identity was not a focus, and thus the intersectional lens used to interpret our findings was not applied to the development of the field guide. Furthermore, HIV testing was not an explicit focus of this study, preventing a more specific line of inquiry on how social identity may connect with HIV testing behavior. Similarly, the quantitative aims utilized the NSFG which was designed as a national fertility survey and therefore has different objectives that those proposed in this dissertation. Consequently, there are factors central to HIV testing that the quantitative aims in this dissertation were not able to assess. For example, the ability to model intersectionality between race and SES and HIV testing was constrained by the income variables in the survey. Moreover, the structure of the survey questions regarding STI services and HIV testing does not confirm whether these services were co-located or whether youth received both at the same time. The use of two separate questions as a proxy for integration was the closest calculation available to conduct these analyses, but is nonetheless a strong assumption to make and potentially undermines the findings in
Aim 3. Additionally, contextual measures of poverty and access (e.g. the % of a census tract living below the poverty line) have been shown to have a significant impact on access to services (4) and health behavior (5) among young men and were not available as part of the public data set. These variables in particular would have enhanced our intersectional approach to these analyses, providing more accurate measures of structural inequality, as well as the opportunity for multilevel modeling.

As has been noted by others, quantifying intersectional identities is difficult and limitations to the measurement of SES are of particular concern throughout social sciences research (6, 7). Investigators grapple with the inclusion or exclusion of possible indicators, as well as the question of which most accurately explain the construct in the United States (8). We chose to use household income, which is subject to reporting error and also prone to change over time (8). Moreover, adolescents may not be well informed about all streams of income a household receives. Using a dichotomized measure of household income as we did is reductionist in its attempt to encapsulate intersectional identities, and although alternative specifications were examined in sensitivity analyses, our approach to modeling SES may be the explanation for non-significant differences in Aim 2. Additionally, the measure of race/ethnicity is inherently problematic, particularly for those who identify as Hispanic and also indicate non-white racial group membership. Although I tried to account for this heterogeneity, limited sample size of non-white Hispanic youth precluded me from assessing this in Aims 2 and 3. Finally, this dissertation focuses on the centrality of race and SES to HIV testing behavior. Other identities such as sexual orientation, ability, immigration status, among many other
markers of structural inequality, may be just as or far more central to individuals’ health-seeking behavior and outcomes. To this end, although the qualitative findings affirm that race and class are important axes to explore among youth of color, and have been the predominant focus of much health disparities work, and intersectional analyses in particular, they are certainly not the only axes on which disparities should be assessed.

In addition to these limitations, social desirability bias may have influenced our analyses. In-depth interviews require a level of intimacy in sharing personal stories and information and our field guides covered sensitive topics that ranged from social identities to sexual relationships. Although we used an iterative interview structure with more sensitive questions saved for the second interview, there is a chance that participants shared what they thought interviewers wanted to hear. The quantitative analyses are impaired by similar constraints: HIV testing remains a sensitive topic, particularly for some communities and because this survey relies on self-reported data, testing history as well as other sexual risk behaviors might go underreported. The use of ACASI offsets the possibility of social desirability bias; however, it is possible that it persists despite this method. Recall bias is also a possibility with lifetime measures – there is a risk of a telescoping effect which generally results in underestimation among those who experienced an event (i.e. HIV testing) in the more distant past (9). Additionally, recall of specific events or behaviors may differ by exposure group (for example, those who received an STI test may be more likely to recall receiving an HIV test). These biases may surface by race or SES or any number of other observed or unobserved factors.

**Public Health Implications**
Despite its shortcomings, this dissertation has valuable implications for both public health research and practice. By adopting an intersectional approach to all three analyses, this dissertation highlights the possible ways that privilege and oppression may manifest at the individual level to generate disparities in HIV testing behavior.

**Implications for Policy and Practice**

Results from this dissertation suggest that any intervention aimed at promoting HIV testing or engagement in the broader HIV care continuum must not only tap into social identities, but also consciously integrate how structural forces of inequality such as incarceration, educational opportunity and economic disenfranchisement, shape life events, cultural norms, individual behaviors, and the shared meaning of social behaviors (such as HIV testing behavior). Public health programming aimed at behavior change among male youth of color will be most effective when it is grounded in “identity-related experiences and processes … which [constitute] opportunities to push back against structured oppression and to create more agentic and pro-social roles, behaviors, and/or spaces [men of color]” (1). Several public health interventions that leverage social identity theory and target gender norms such as Straight Talk and Coaching Boys into Men (2) have tapped into this vein. Our quantitative findings point to explicit points of intervention that differ by sub-population. In Chapter 5 we noted that socio-behavioral drivers varied across racial groups so targeting high-risk youth who identify as Hispanic may be less effective than doing so among non-Hispanic whites or blacks, for example. Similarly, in Chapter 6 we noted that low income youth who sought STI services were less likely to report receiving an HIV test; however, upon deeper examination of within-
group dynamics, we noticed that this was only the case for black males. Programmatic and policy measures that actively integrate these nuances in HIV prevention programming have the potential to more effectively reach young men of color in HIV testing and care.

**Research Implications**

Intersectional theorists propose that multiple social identities must be acknowledged and incorporated concomitantly into health disparities research, as the siloed examination of identities such as race, sexual orientation or gender, provides only a partial picture of how privilege and oppression exact health costs across society. When we fail to examine and more precisely model the multidimensional aspects of social identities – the raced gendered classed able-bodied aspects of individuals – we not only minimize our understanding of individuals’ lived experience, we perpetrate the legacy of colonial thinking that disembodies the most marginalized populations by making them invisible in the generation of new knowledge. Findings from our quantitative analyses reiterate the importance of expanding our methodological approaches beyond a unitary approach to better understand racial disparities in HIV research.

This dissertation highlights the value of pairing qualitative analyses with large, nationally representative data sets to assess synergistic effects at the intersections of multiple social identities. Additionally, as the qualitative results in this dissertation suggest, intersectional analyses will be further aided by integrating community-level measures and using multilevel modeling approaches to further map out and disentangle disparities in HIV testing. As these methods continue to gain traction in health disparities research,
population level and community specific evidence will improve tailored intervention strategies.

**Conclusion**

There is clear evidence that HIV testing is not enough to attenuate racial disparities in the HIV care continuum and intersectional approaches to this issue offer a promising way forward. Recent estimates suggest that an upwards of 30% of people who know their serostatus are not accessing care with youth ages 13-24 and black men and women least likely to be linked to care (10, 11). Given what we know about racial disparities in the care continuum, there is an urgent need to better understand the intersectional drivers behind engagement in care as well as those who fall out of care.

Despite its growing popularity, many scholars still consider intersectionality a buzzword without analytic teeth. This dissertation refutes that position by providing analytic frameworks that demonstrate how health disparities research can give voice and visibility to populations who experience some of the most pronounced and complex health inequities and yet still remain invisible in research and practice. Intersectional methods for studying how power and oppression circulate through institutional and microlevel action are readily available but also require researchers and practitioners to explore the theoretical discourse and resist conventional practice of static, categorical comparisons. This dissertation attempts to provide one way forward in the hopes that such methods and the results they generate may hone in on effective strategies for reducing the disparities in engagement in the HIV care continuum.
Chapter 7 References


Appendix

A.1. Observation Form

<table>
<thead>
<tr>
<th>Observation: 00</th>
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</thead>
<tbody>
<tr>
<td><strong>Observer:</strong></td>
</tr>
<tr>
<td><strong>Date of Observation:</strong></td>
</tr>
<tr>
<td><strong>Venue:</strong></td>
</tr>
<tr>
<td><strong>Time started:</strong></td>
</tr>
</tbody>
</table>

Note: Use a new observation sheet for new locations within the same venue. Observe each location for 30 minutes or until 5 potential study participants (eligibles) appear.

The focus of your observation: to determine if this is the most appropriate study site for recruitment of young men and women (18-24) from low and middle income backgrounds

1) Setting: Describe the location within the venue (food court, Starbucks, etc.)

2) People:
   o About how many people are there?
   o What areas in the space that you are observing do they congregate?
   o What was the age range?
   o Characteristics that suggest potential eligibility criteria
     - What were they doing? (eating, shopping, etc.)
     - What are they wearing?

3) Interactions:
   o How were people interacting? (i.e. mood: laughing, fighting, in conversation)
   o How large were the groups of people?

4) Thoughts about Venue
   o Would this be a good place to conduct the survey?
   o Better for one group of eligible versus another?
     - Rationale for why/how you’ve concluded this:

A.2. Recruitment Script & Screening tool
Hi. I am from Johns Hopkins School of Public Health and we are conducting a study looking at the places where young women and men grew up in, their sexual experiences and what they think about being young men and women. The study is two conversation style interviews. Today we are seeing if people are interested. If they are, we will want to conduct the first interview and schedule another one in the next week. The interviews will take 45 minutes to an hour and participants will be compensated $25 for their time for today.

Are you interested in volunteering?

If No:
Thank you very much for your time.

If Yes:
If you volunteer to participate, we would like to conduct the first interview today and then follow up with a second interview later this week. You will be paid $35 for the 2nd interview. That interview will also last 45 minutes to an hour. I want to ask you a few questions to see if you are eligible to be in the study.

1. * What is your birth date? _____ / _____ / _____ If 18 or over, eligible
   DD MM YY Age

2. What is the longest sexual relationship that you have had in the past three years? By sexual, I mean you had regular or oral sex with the person. Sex eligible
   ________ (months, year)
   If respondent hasn't been in a sexual relationship > 3 months, not eligible

3. What was the longest relationship you have been in over the past three years?
   ____ Months ____ years

4. Was the person in this relationship a man or a woman?
   Man
   Woman
   If respondent is same sex as person in relationship, not eligible

Approval Date: April 13, 2011
IRB Study No. 0001651
5. Do you live in Baltimore city?

Yes
No

If respondent lives outside of Baltimore city, they are, not eligible

6. Was the residence you grew up (spent the most time in as a child) in owned or rented?

Owned
Rented
Don’t know

7. When you were in school, did you receive free lunch?

No
Yes
Don’t know

8. What was the highest level of education completed by your primary caregiver?

Less than 7th grade
Junior high/middle school
Partial high school (10th or less)
High school graduate
Partial college
College education
Graduate degree
Don’t know

Interviewer’s initial ________________________

Group 1 Eligible ______  Group 2 Eligible ______  Not Eligible ______
A.3. Consent Form

JOHNS HOPKINS BLOOMBERG SCHOOL OF PUBLIC HEALTH

INFORMED CONSENT DOCUMENT

Qualitative Participants

Study Title: Gender role beliefs and partner selection: HIV/STI Risk among urban youth

What you should know about this study
You are being asked to join a research study that is looking at the places where young women and men grew up in, their sexual experiences and what they think about being young men and women. You are being asked to be in the study because you live in Baltimore city, are African American, and are 18 years old or older. African Americans have significantly higher rates of sexually transmitted infections so that is why the study focuses on African Americans. This consent form explains the research study and may contain words that you do not understand. Please ask questions about anything you do not understand.

Purpose of Research Project:
We are interested in finding out about the home you grew up in, how you think about being a man or a woman, and sexual relationships. Forty people aged 18-24 years old will be a part of this study.

Procedures:
If you agree to join this study the following will happen solely for research purposes:

1) We will ask you to participate in two interviews that are like conversations.
2) We will interview you where we recruited you or at another convenient location for the first interview.
3) At the end of the first interview, we will ask you for a phone number to remind you about the second interview.
4) If you give us permission we will tape the interview.
5) The second interview can take place in the same location as the first or at another convenient location such as a McDonald's or Starbucks.
4) Each interview will last 45 minutes to an hour.
5) If you ask for mental health or HIV/STI testing, we will make the appropriate referrals.

Risks/Discomforts:
Because of the sensitive nature of some of the questions, you may feel uncomfortable. You can, however, choose not to answer any questions and you are free to stop the interview at any time. All the information you provide about yourself and any sexual partners will not be linked directly to you. There is a possibility of being overhead in a public location.

Anticipated Benefits:
There are no direct benefits from being a part of the study.

Page 1 of 4
May 2, 2011
Payment:
You will be paid $25 to complete the first interview and $35 dollars to complete the second interview.

Protecting data confidentiality:
We will do everything possible to keep the information that you give us confidential. We will keep your responses private and confidential. Your name will not be on the tape and the tape will be destroyed shortly after the study is completed. We will also destroy any notes that we take during the interview. You will not be personally identified in any reports that may result from this study. To help us protect your privacy, we have obtained a Certificate of Confidentiality from the National Institutes of Health. With this Certificate, we researchers cannot be forced to share information that may identify you, even by a court subpoena, in any federal, state, or local civil, criminal, administrative, legislative, or other proceedings. The researchers will use the Certificate to resist any demands for information that would identify you, except as explained below.
You should understand that a Certificate of Confidentiality does not prevent you from voluntarily releasing information about yourself or your involvement in this research. If an insurer, employer, or other person obtains your written consent to receive research information, then the researchers may not use the certificate to withhold that information. If you inform us that you are planning to harm yourself or others, we are not protected by the Certificate of Confidentiality from telling the appropriate authorities. We will also give out information to state or local authorities if we suspect abuse or neglect of a child or a dependent adult.

What happens if you leave the study early?
Your participation is completely voluntary, meaning that it is up to you. You may choose to stop taking part in the study at any time. To do so, tell the person conducting the interview that you do not want to continue taking part in the study. If you choose to leave, we will use the data that you have given us while you were in the study.

Who do I call if I have questions or problems?
Call the principal investigator, Susan Sherman, at (410) 614-3518 if you have questions about the study or get sick or injured as a result of being in this study. If you are having a medical emergency, you should call 911 or go directly to the nearest emergency room.
Call or contact the Johns Hopkins Bloomberg School of Public Health IRB Office if you have questions about your rights as a study participant. Contact the IRB if you feel you have not been treated fairly or if you have other concerns. The IRB contact information is:

Address: Johns Hopkins Bloomberg School of Public Health
615 N. Wolfe Street, Suite E1100
Baltimore, MD 21205

Telephone: 410-955-3153
Toll Free: 1-888-262-3242
Fax: 410-502-0564
E-mail: irboffice@jhsph.edu

What does your signature on this consent form mean?

Your signature on this form means:
- You have been informed about this study's purpose, procedures, possible benefits and risks.
- You have been given the chance to ask questions before you sign.
- You have voluntarily agreed to be in this study.

Print name of Adult Participant ___________________________ Signature of Adult Participant ___________________________ Date ____________

Print name of Legally Authorized Representative (LAR) ___________________________ Signature of LAR ___________________________ Date ____________

Relationship of LAR to Participant
A.4. Qualitative Interview Guide: Interview 1

Thank you for meeting with me today. As I mentioned earlier, this study is about how men and women think about being men or being women, and how relate to each other. I’ll be writing down some of what you tell me to help me ask you more questions. But because you are telling me a lot of information, I won’t be able to remember it or write all of it down, this interview will be tape recorded like I told you in the consent. Remember, your name will never be connected to what you say and the tape will be destroyed after the study.

Age of participant: _____

Gender (circle): Male Female

1.0 Family Growing up

Thanks so much for speaking with me today. I’d like to begin by asking you a few questions about how you grew up.

1.1 Can you describe for me the house you spent the most time in growing up?

Probes:
What type of house?
Apartment?
How many rooms?
Where?

1.2 Tell me about the members of your family that you lived with.

Follow-up questions:
Who, how many
Who did you live with growing up?
Who else lived in the house you spent the most time in?
Parents, grandparents, aunts, uncles, cousins?

1.3 What did you do with your time?

Probes
School, sports, movies, hanging out with friends

1.4 When you were younger, what sorts of goals did you have for yourself? Meaning – what was something that you thought about doing when you grew up that was really important to you.

Probes
For a job, grades, college, sports teams

1.5 How did you come up with these goals?

Follow-up questions:
Did your friends or family influence them? Did a teacher influence them?

1.6 To what extent have you achieved these goals?

Follow-up questions:
Can you tell me more about that? Why do you think that?
1.7 Were there values that were important to your parents/guardians?

*Probes*
Being honest, hard worker, doing well in school

1.8 How did those values and expectations influence how you think about your future?

2.0 Role models

2.1 Think about someone you know personally that you look up to (By look up I mean you respect them). Can you describe that person to me?

2.2 If you had to pick five words to describe his/her personality, what would they be?

2.3 What do you like about this person?

2.4 Now think about someone you don’t know (like a celebrity or politician or athlete) that you look up to. Can you describe that person to me?

*Probes*
What do you like about this person?
Is he or she someone you would like to be more like? In what way?

2.5 What do you think of Barack Obama? (as a role model, as a person?)

3.0 Gender

3.1 Were there certain things that you think your parents/caregiver expected of you because you were a girl/boy?

*Probes*
What sort of things? (behavior like washing dishes or doing other chores)?

**NOTE: If respondent lived with other children ask:**
*Sometimes boys and girls are treated differently and are expected to do different things in the house – girls take care of kids, boys fix things*

3.2 When you were growing up, were you treated in different ways than your brothers/sisters/other kids in the house? (if yes, specify different than whom - brother or sister)

*Probes*
In terms of household duties, school performance, your future
Punished, encouraged, etc.
Can you describe those differences?

3.3 What types of things did you hear growing up about what it means to be a (wo)man?

*Probes*
From who/where? mom, dad, siblings, grandparents

3.4 How do you think these things influenced what you thought about your future?
NOTE: If respondent has a child ask:

3.5 What types of expectations do you have of your son/daughter because he/she is a boy/girl?

Probes
How would this differ if he/she was the opposite sex?

4.0 Ideals

4.1 In general, what makes a woman a woman and a man a man?

Probes
What they do
How they look
How they act

4.2 What are some things that make a man attractive to a woman?

Probes
Image, reputation, physical appearance, how he acts

4.3 What are some things that make a woman attractive to men?

Probes
Image, reputation, physical appearance, how he acts

4.4 How is a woman in a relationship supposed to act?

Probes
When she is away from her partner
When she is with her partner
When they have a fight
When they are in public
When they are out with friends

4.5 How is a man in a relationship supposed to act?

Probes
When he is away from his partner
When he is with his partner
When they have a fight
When they are in public
When they are out with friends

5.0 Class

Last I'd like to ask you a few questions about what you think about class. Imagine a ladder. This ladder represents how American society is set up. At the top of the ladder are the people who are the best off – the have the most money, the highest amount of schooling and the jobs that bring the most respect. At the bottom are people who are the worst off. They have the least money, little or no education, no job or jobs that no one
wants or respects.

5.1 Now think about your family. Where do you think your family would be on this ladder?

Follow-up questions:
Can you tell me more about why you think that?

5.2 How does your family’s place on the ladder compare to where your friends’ families are?

Follow-up questions:
Can you tell me more about why you think that?

5.3 How do you think your family’s place on the ladder influenced what kind of options and opportunities you have?

Probes
For work?
For school?
For partners?

5.4 Can you tell me more about what kinds of options and opportunities you feel like you have?

Is there anything else you would like to tell me about yourself and how you grew up?

Thank you for your time!
A.5. Male Qualitative Interview Guide: Interview 2

Thank you for meeting with me again today. The purpose of this part of the study is for you to talk about your thoughts about men and women and to talk about your own experiences in relationships. I’ll be writing down some of what you tell me to help me ask you more questions. But because you are telling me a lot of information, I won’t be able to remember it or write all of it down, this interview will be tape recorded like I told you in the consent. Remember, your name will never be connected to what you say and the tape will be destroyed after the study.

Like last week, we will be talking for about an hour. Let me know if you don’t understand anything that I ask. And as we talked about, you don’t have to answer any question that you are uncomfortable with.

1.0 Intro
Before we begin, I want to review some of the things we talked about last week in our first interview. *Interviewer: review a few details to refresh the respondent about what was discussed during the last interview.*

1.1 Is there anything you want to add from our conversation last week?

2.0 Perceptions of self
Now I’d like to ask you a few questions about how you see yourself.

2.1 What are five words you would use to describe yourself?

2.2 How would you describe yourself as a:
   - Son
   - Man
   - African American

   *Sometimes people have things about them that draws others to them- makes other people want to be around them, or like them —like magnets. Do you know what I mean?*

2.3 What do you think draws other people to you?

   *Probes*
   - Friends, romantic partners, young people, etc.

3.0 Current or Recent Relationship
*I want to ask you a few questions about your current (or if no current, most recent girlfriend). By girlfriend I mean the person that you most recently (including now) had/are having a regular sexual relationship with.*

3.1 Can you tell me about your most recent girlfriend?

   *Probes*
   - How did you two meet?
Where did you meet her?
How long have you known her?

3.2 How would you describe your relationship with this person?

Probes
How long have you been together?
What do you two end up doing together on a regular day?

3.3 How do you two communicate?

Probes
Texting, cell phones, in person
Which method do you use the most?
Which do you prefer?

3.4 How often do you see her?

3.5 Thinking about this relationship, tell me about the things you have to make decisions about and who makes those decisions.

Probes
Financial, sexual, where to go, who to hang out with, what to wear, etc.

3.6 Are there certain areas that you have more control over than she does?

Probes
Like what?

3.7 Can you tell me about the last time the two of you disagreed?

Probes
What was the fight about?
How did you resolve it?

3.8 How important is this relationship to you?

Probes
Relative to past relationships or other relationships in your life

3.9 Do you see yourself with this person in the future?

3.10 Is there anything that this person could do that wouldn’t forgive?

Probes
Something she says? Something she does?

3.11 In general, what do you think makes an ideal girlfriend?

Probes
Physical appearance
The way she acts
The way that she treats you
The way she dresses
Her reputation

4.0 Sexual Activity
Now I want to ask you more questions about your sex life with your current girlfriend. If you don’t have sex with your current girlfriend, I’d like to learn most about your most recent relationship where you had sex.

4.1 Do you have sex with your current girlfriend?

(if no sex with the current girlfriend then the rest of the questions should be asked about the most recent person with whom they have had)

4.1a. Who was the last girlfriend who you had sex with?

Probes
When did you date her? How long did you date her?

4.2 Have you had sex with her? By sex I mean regular or oral?

If yes
4.3 Can you tell me about the first time you had sex?

Probes
Tell me about the day/night it happened. Had he asked you to have sex before? Had either of you asked each other to have sex before? If yes, why then?
What type of sex did you have?

4.4 How often do you have sex with her now?

4.5 Do you use anything to protect against pregnancy? I mean condoms, IUD, birth control.

Probes
What type?
How often?
Who makes the decisions regarding this?

4.6 Tell me about condom use with your most recent girlfriend.

Probes
If you do use condoms, how often do you use condoms?
What types of sexual activity do you use condoms for?
Who decided to start using condoms? Who decided to stop?

4.7 Can you tell me about any experiences you’ve had with cheating in your current/most recent relationship?

Probes
Condom use when cheating

4.8 In general, are there certain people that you would not use condoms with?

4.9 In general are there any situations when you would choose not to use a condom?

4.10 Can you tell me about an experience when you planned or wanted to use a condom, but then ended up not using one?

Probes
What happened?

5.0 Conclusion

5.1 Where do you see yourself at age 30?
In terms of:
Family?
Work?

5.2 Is there anything else you’d like to share with me?

Thank you for taking the time to talk with me today.
### Chapter 5 Appendix Tables

#### Table A5.1. Description of Sample by Race < 200FPL (n=1,166)

<table>
<thead>
<tr>
<th></th>
<th>NH White</th>
<th>NH Black</th>
<th>Hispanic</th>
<th>Total</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Col %</td>
<td>95% CI</td>
<td>Col %</td>
<td>95% CI</td>
<td>Col %</td>
</tr>
<tr>
<td>Tested in past year for HIV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>84.7</td>
<td>[80.3,88.3]</td>
<td>76</td>
<td>[70.0,81.1]</td>
<td>83.2</td>
</tr>
<tr>
<td>Sexual minority</td>
<td>4.5</td>
<td>[2.3,8.4]</td>
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<td>[1.4,5.3]</td>
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<tr>
<td>Lives in an urban area</td>
<td>31.3</td>
<td>[22.3,42.0]</td>
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<td>[49.1,66.6]</td>
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<tr>
<td>Homeless in past year</td>
<td>2.2</td>
<td>[0.9,5.2]</td>
<td>2.1</td>
<td>[0.7,5.8]</td>
<td>1.6</td>
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<tr>
<td>High-risk behavior</td>
<td>57.6</td>
<td>[51.5,63.5]</td>
<td>71.4</td>
<td>[64.6,77.3]</td>
<td>72.7</td>
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<tr>
<td>Any anal sex</td>
<td>5.4</td>
<td>[2.7,10.4]</td>
<td>3.8</td>
<td>[1.8,7.8]</td>
<td>3.3</td>
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<tr>
<td>Injected drugs in past year</td>
<td>0.2</td>
<td>[0.0,0.9]</td>
<td>1.5</td>
<td>[0.4,5.9]</td>
<td>0.0</td>
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<tr>
<td>5+ partners in lifetime</td>
<td>41.1</td>
<td>[33.8,48.8]</td>
<td>61.5</td>
<td>[54.6,67.9]</td>
<td>50.1</td>
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<tr>
<td>Condom used at last vaginal sex</td>
<td>55.7</td>
<td>[48.8,62.4]</td>
<td>70.4</td>
<td>[63.2,76.7]</td>
<td>53.0</td>
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<tr>
<td>Treated for an STI in past year</td>
<td>5.6</td>
<td>[3.1,10.1]</td>
<td>10.2</td>
<td>[6.4,15.8]</td>
<td>5.7</td>
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<tr>
<td>Has a usual source of care</td>
<td>72.9</td>
<td>[64.3,80.1]</td>
<td>56.4</td>
<td>[49.0,63.5]</td>
<td>49.7</td>
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</table>

* Observations are weighted; sample allowed to float.
<table>
<thead>
<tr>
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<th>NH White</th>
<th>NH Black</th>
<th>Hispanic</th>
<th>Total</th>
<th>p-value</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Col %</td>
<td>95% CI</td>
<td>Col %</td>
<td>95% CI</td>
<td>Col %</td>
</tr>
<tr>
<td>Tested in past year for HIV</td>
<td>26.2</td>
<td>[21.5,31.5]</td>
<td>54.3</td>
<td>[44.5,63.7]</td>
<td>34.2</td>
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<tr>
<td>Age Group</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>18-24</td>
<td>90.2</td>
<td>[87.0,92.7]</td>
<td>84.6</td>
<td>[74.8,91.1]</td>
<td>90.2</td>
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<td>Sexual minority</td>
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<td>[1.0,4.4]</td>
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<td>[20.9,36.1]</td>
<td>56.4</td>
<td>[45.2,67.0]</td>
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<td>[0.0,1.3]</td>
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<td>High-risk behavior</td>
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<td>[53.9,63.8]</td>
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<td>[59.0,75.0]</td>
<td>66.3</td>
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<td>Any anal sex</td>
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<td>[1.3,3.7]</td>
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<td>[0.7,3.8]</td>
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<tr>
<td>Injected drugs in past year</td>
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<td>[0.4,2.9]</td>
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<td>[0,7.3]</td>
<td>4</td>
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<tr>
<td>5+ partners in lifetime</td>
<td>41.8</td>
<td>[36.8,47.0]</td>
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<td>[50.6,67.1]</td>
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<tr>
<td>Condom used at last vaginal sex</td>
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<td>[59.1,68.8]</td>
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<td>[51.5,71.4]</td>
<td>57.1</td>
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<tr>
<td>Treated for an STI in past year</td>
<td>3.3</td>
<td>[2.0,5.5]</td>
<td>8.1</td>
<td>[4.4,14.4]</td>
<td>1.1</td>
</tr>
<tr>
<td>Lacked health insurance the year prior</td>
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<td>[7.3,16.4]</td>
<td>20.8</td>
<td>[14.2,29.5]</td>
<td>32</td>
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<td>Has a usual source of care</td>
<td>76.4</td>
<td>[71.5,80.7]</td>
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<td>[57.2,72.8]</td>
<td>58.8</td>
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*observations are weighted; sample size allowed to float
Table A5.3 Sensitivity Analysis FPL cut point. Model 2: Logistic Regression of lifetime HIV test using an intersectional measure of race and SES among males 15-24

<table>
<thead>
<tr>
<th></th>
<th>Col 1: Interaction of race and income only</th>
<th>Col 2: Fully adjusted model</th>
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<tbody>
<tr>
<td></td>
<td>N (wtd)</td>
<td>ORs</td>
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<tr>
<td><strong>Race x Income</strong></td>
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<tr>
<td>NH White</td>
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<tr>
<td>&gt;=100FPL</td>
<td>1021</td>
<td>REF</td>
</tr>
<tr>
<td>NH White &lt;100FPL</td>
<td>196</td>
<td>1.374</td>
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<td>NH Black &gt;=100FPL</td>
<td>367</td>
<td><strong>2.67</strong></td>
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<td>NH Black &lt;100FPL</td>
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<td>Hispanic &gt;=100FPL</td>
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<td>1.32</td>
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<td>Hispanic &lt;100FPL</td>
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<td>1.37</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-24</td>
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<td></td>
</tr>
<tr>
<td>Identifies as a sexual minority</td>
<td></td>
<td>3.63</td>
</tr>
<tr>
<td>Lives in an urban area</td>
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<td>0.941</td>
</tr>
<tr>
<td>Lifetime incarceration</td>
<td></td>
<td><strong>2.11</strong></td>
</tr>
<tr>
<td>High-risk sexual behavior</td>
<td></td>
<td><strong>2.67</strong></td>
</tr>
<tr>
<td>Treated for an STI</td>
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<td><strong>4.078</strong></td>
</tr>
<tr>
<td>Lacked health insurance the year prior</td>
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<td>1.108</td>
</tr>
<tr>
<td>Usual Source of care</td>
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<td>0.977</td>
</tr>
</tbody>
</table>

*p<0.05; **p<0.01; ***p<0.001
Table A5.4 Sensitivity Analysis excluding sexual minorities. Model 2: Logistic Regression of lifetime HIV test using an intersectional measure of race and SES among males 15-24 (n=2,339)

<table>
<thead>
<tr>
<th>Interaction of race and income only</th>
<th>Fully adjusted model</th>
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<tbody>
<tr>
<td>ORs</td>
<td>95% CI</td>
</tr>
<tr>
<td><strong>Race x Income</strong></td>
<td></td>
</tr>
<tr>
<td>NH White &gt;=200FPL</td>
<td>REF</td>
</tr>
<tr>
<td>NH White &lt;200FPL</td>
<td>1.42 (0.95 - 2.12)</td>
</tr>
<tr>
<td>NH Black &gt;=200FPL</td>
<td>3.52 (2.16 – 5.74)***</td>
</tr>
<tr>
<td>NH Black &lt;200FPL</td>
<td>2.81 (1.91 – 4.14)**</td>
</tr>
<tr>
<td>Hispanic &gt;=200FPL</td>
<td>1.56 (1.03 – 2.36)*</td>
</tr>
<tr>
<td>Hispanic &lt;200 FPL</td>
<td>1.45 (0.99 - 2.14)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>15-17</td>
<td>REF</td>
</tr>
<tr>
<td>18-24</td>
<td>2.00 (1.186 - 3.447)*</td>
</tr>
<tr>
<td><strong>Lives in an urban area</strong></td>
<td>0.96 (0.67 - 1.37)</td>
</tr>
<tr>
<td><strong>Lifetime incarceration</strong></td>
<td>2.03 (1.40 – 2.95)***</td>
</tr>
<tr>
<td><strong>High-risk sexual behavior</strong></td>
<td>2.75 (2.00 - 3.78)***</td>
</tr>
<tr>
<td><strong>Treated for an STI</strong></td>
<td>3.95 (1.72 - 9.05)***</td>
</tr>
<tr>
<td><strong>Lacked health insurance the year prior</strong></td>
<td>1.13 (0.73 - 1.75)</td>
</tr>
<tr>
<td><strong>Usual Source of care</strong></td>
<td>0.99 (0.67 - 1.46)</td>
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</tbody>
</table>

*p<0.05; ** p<0.01; *** p<0.001
Table A5.6. Contrast of complete case and multiple imputation estimates

<table>
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<th>Complete case estimates</th>
<th>Estimates using multiple imputation</th>
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<tr>
<td></td>
<td>AORs</td>
<td>95% CI</td>
</tr>
<tr>
<td><strong>Race x Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NH White</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;=200FPL</td>
<td>1.41</td>
<td>(0.93 - 2.14)</td>
</tr>
<tr>
<td>NH White</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;200FPL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NH Black</td>
<td>3.19</td>
<td>(1.83 - 5.57)**</td>
</tr>
<tr>
<td>NH Black</td>
<td>2.38</td>
<td>(1.50 - 3.77)**</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1.63</td>
<td>(1.03 - 2.59)*</td>
</tr>
<tr>
<td>Hispanic &lt;200 FPL</td>
<td>1.22</td>
<td>(0.71 - 2.11)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-17</td>
<td>2.11</td>
<td>(1.22 - 3.63)**</td>
</tr>
<tr>
<td>18-24</td>
<td>3.56</td>
<td>(1.64 - 7.72)**</td>
</tr>
<tr>
<td><strong>Identifies as a sexual minority</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lives in an urban area</td>
<td>0.93</td>
<td>(0.65 - 1.33)</td>
</tr>
<tr>
<td><strong>Lifetime incarceration</strong></td>
<td>2.06</td>
<td>(1.42 - 3.00)**</td>
</tr>
<tr>
<td><strong>High-risk sexual behavior</strong></td>
<td>2.715</td>
<td>(1.98 - 3.72)**</td>
</tr>
<tr>
<td><strong>Treated for an STI</strong></td>
<td>4.158</td>
<td>(1.84 - 9.39)**</td>
</tr>
<tr>
<td><strong>Lacked health insurance the year prior</strong></td>
<td>1.104</td>
<td>(0.72 - 1.71)</td>
</tr>
<tr>
<td><strong>Usual Source of care</strong></td>
<td>0.973</td>
<td>(0.66 - 1.44)</td>
</tr>
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</table>

*p<0.05; **p<0.01; ***p<0.001
Table A5.7. Bivariate examination of survey year on lifetime report of HIV test (n=2,414)

<table>
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<tr>
<th>Lifetime report of HIV test</th>
<th>2006 Col %</th>
<th>95% CI</th>
<th>2007 Col %</th>
<th>95% CI</th>
<th>2008 Col %</th>
<th>95% CI</th>
<th>2009 Col %</th>
<th>95% CI</th>
<th>2010 Col %</th>
<th>95% CI</th>
<th>Total Col %</th>
<th>95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No (n=1,568)</td>
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<td>[60.4,73.5]</td>
<td>67.6</td>
<td>[60.0,74.4]</td>
<td>65.9</td>
<td>[58.7,72.4]</td>
<td>61.6</td>
<td>[54.8,68.0]</td>
<td>71.9</td>
<td>[64.9,78.1]</td>
<td>66.1</td>
<td>[62.6,69.4]</td>
<td>0.35</td>
</tr>
<tr>
<td>Yes (n=846)</td>
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<td>[26.5,39.6]</td>
<td>32.4</td>
<td>[25.6,40.0]</td>
<td>34.1</td>
<td>[27.6,41.3]</td>
<td>38.4</td>
<td>[32.0,45.2]</td>
<td>28.1</td>
<td>[21.9,35.1]</td>
<td>33.9</td>
<td>[30.6,37.4]</td>
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### Table A6.1 Description of Sample by Race among low-SES (n=334)

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<tr>
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<th>NH White (n=99)</th>
<th>NH Black (n=134)</th>
<th>Hispanic (n=101)</th>
<th>p-value</th>
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<tbody>
<tr>
<td>Tested in past year for HIV</td>
<td>Col %</td>
<td>95% CI</td>
<td>Col %</td>
<td>95% CI</td>
</tr>
<tr>
<td>Age Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-17</td>
<td>55.9</td>
<td>[38.7,71.7]</td>
<td>48.7</td>
<td>[36.4,61.1]</td>
</tr>
<tr>
<td>18-24</td>
<td>81.5</td>
<td>[71.0,88.8]</td>
<td>77.4</td>
<td>[68.0,84.7]</td>
</tr>
<tr>
<td>Sexual Minority</td>
<td>8.1</td>
<td>[1.9,28.5]</td>
<td>2</td>
<td>[0.5,8.0]</td>
</tr>
<tr>
<td>Homeless in past year</td>
<td>3.3</td>
<td>[0.5,17.3]</td>
<td>3.4</td>
<td>[0.8,13.8]</td>
</tr>
<tr>
<td>High-risk behavior</td>
<td>81</td>
<td>[69.7,88.8]</td>
<td>74</td>
<td>[65.2,81.3]</td>
</tr>
<tr>
<td>Lives in an urban area</td>
<td>32.3</td>
<td>[19.6,48.3]</td>
<td>67.5</td>
<td>[56.9,76.6]</td>
</tr>
<tr>
<td>Lacked health insurance the year prior</td>
<td>21.3</td>
<td>[10.4,38.7]</td>
<td>15.1</td>
<td>[9.1,24.1]</td>
</tr>
<tr>
<td>Has a usual source of care</td>
<td>64</td>
<td>[44.2,80.0]</td>
<td>57.7</td>
<td>[47.5,67.2]</td>
</tr>
<tr>
<td>Where services were received</td>
<td>Private or HMO Office</td>
<td>49.9</td>
<td>[38.3,61.5]</td>
<td>34.6</td>
</tr>
<tr>
<td></td>
<td>Community/FP/School/Emp</td>
<td>43.5</td>
<td>[31.4,56.5]</td>
<td>44.6</td>
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### Table A6.2. Description of Sample by Race among high SES (n=278)

<table>
<thead>
<tr>
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<th>NH White (n=144)</th>
<th>NH Black (n=87)</th>
<th>Hispanic (n=47)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested in past year for HIV</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Col %</td>
<td>58.9</td>
<td>67.7</td>
<td>78.4</td>
<td>0.172</td>
</tr>
<tr>
<td>95% CI</td>
<td>[47.8,69.1]</td>
<td>[50.8,81.0]</td>
<td>[58.5,90.3]</td>
<td></td>
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<tr>
<td>Age Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-17</td>
<td>7.6</td>
<td>13.2</td>
<td>6.9</td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>92.4</td>
<td>86.8</td>
<td>93.1</td>
<td></td>
</tr>
<tr>
<td>95% CI</td>
<td>[3.8,14.6]</td>
<td>[6.0,26.8]</td>
<td>[1.6,25.0]</td>
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</tr>
<tr>
<td>Sexual Minority</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Col %</td>
<td>4.5</td>
<td>3.5</td>
<td>5.8</td>
<td>0.83</td>
</tr>
<tr>
<td>95% CI</td>
<td>[1.9,10.1]</td>
<td>[1.4,8.5]</td>
<td>[1.4,21.3]</td>
<td></td>
</tr>
<tr>
<td>Homeless in past year</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Col %</td>
<td>1.7</td>
<td>0.5</td>
<td>1.1</td>
<td>0.54</td>
</tr>
<tr>
<td>95% CI</td>
<td>[0.2,11.2]</td>
<td>[0.1,4.1]</td>
<td>[0.5,4.1]</td>
<td></td>
</tr>
<tr>
<td>High-risk behavior</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Col %</td>
<td>71.9</td>
<td>73.5</td>
<td>71.7</td>
<td>0.98</td>
</tr>
<tr>
<td>95% CI</td>
<td>[61.7,80.2]</td>
<td>[58.7,84.5]</td>
<td>[43.5,89.3]</td>
<td></td>
</tr>
<tr>
<td>Lives in an urban area</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Col %</td>
<td>38.5</td>
<td>58.7</td>
<td>47.5</td>
<td>0.155</td>
</tr>
<tr>
<td>95% CI</td>
<td>[25.7,53.1]</td>
<td>[43.1,72.8]</td>
<td>[26.5,69.3]</td>
<td></td>
</tr>
<tr>
<td>Lacked health insurance the year prior</td>
<td>4.6</td>
<td>26.0</td>
<td>29.3</td>
<td>0.001</td>
</tr>
<tr>
<td>Has a usual source of care</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Col %</td>
<td>80.9</td>
<td>70.8</td>
<td>72.8</td>
<td>0.374</td>
</tr>
<tr>
<td>95% CI</td>
<td>[70.8,88.1]</td>
<td>[55.4,82.6]</td>
<td>[52.9,86.5]</td>
<td></td>
</tr>
<tr>
<td>Where services were received</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private or HMO Office</td>
<td>55.3</td>
<td>39.5</td>
<td>60.5</td>
<td></td>
</tr>
<tr>
<td>Community/FP/School/Em employer clinic</td>
<td>31.4</td>
<td>44</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>Acute care setting</td>
<td>13.3</td>
<td>16.5</td>
<td>8.5</td>
<td>0.477</td>
</tr>
<tr>
<td>95% CI</td>
<td>[6.5,25.3]</td>
<td>[7.9,31.2]</td>
<td>[2.3,26.6]</td>
<td></td>
</tr>
</tbody>
</table>
Table A6.3. Bivariate examination of survey year on past-year report of HIV test (n=612)

<table>
<thead>
<tr>
<th>Past-year report of HIV test</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Total</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Col %</td>
<td>95% CI</td>
<td>Col %</td>
<td>95% CI</td>
<td>Col %</td>
<td>95% CI</td>
<td>Col %</td>
</tr>
<tr>
<td>No</td>
<td>51.6</td>
<td>[36.0,66.9]</td>
<td>39.7</td>
<td>[27.7,53.1]</td>
<td>35.8</td>
<td>[25.2,47.9]</td>
<td>37.8</td>
</tr>
<tr>
<td>Yes</td>
<td>48.4</td>
<td>[33.1,64.0]</td>
<td>60.3</td>
<td>[46.9,72.3]</td>
<td>64.2</td>
<td>[52.1,74.8]</td>
<td>62.2</td>
</tr>
</tbody>
</table>
Table A6.4 Sensitivity Analysis FPL cut point. Model 2: Logistic Regression of past-year HIV test using an intersectional measure of race and SES among males 15-24

<table>
<thead>
<tr>
<th>RacexIncome</th>
<th>Col 1: Interaction of race and income only</th>
<th>Col 2: Fully adjusted model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ORs</td>
<td>95% CI</td>
</tr>
<tr>
<td>NH White &gt;=100FPL</td>
<td>REF</td>
<td>REF</td>
</tr>
<tr>
<td>NH White &lt;100FPL</td>
<td>1.00</td>
<td>(0.44 - 2.24)</td>
</tr>
<tr>
<td>NH Black &gt;=100FPL</td>
<td>1.29</td>
<td>(0.37 - 4.45)</td>
</tr>
<tr>
<td>NH Black &lt;100FPL</td>
<td>1.00</td>
<td>(0.44 - 2.24)</td>
</tr>
<tr>
<td>Hispanic &gt;=100FPL</td>
<td>1.96</td>
<td>(1.01 - 3.83)</td>
</tr>
<tr>
<td>Hispanic &lt;100FPL</td>
<td>1.17</td>
<td>(0.47 - 2.89)</td>
</tr>
</tbody>
</table>

**Age**

<table>
<thead>
<tr>
<th></th>
<th>ORs</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-17</td>
<td>REF</td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>2.34</td>
<td>(1.09 - 5.06)</td>
</tr>
</tbody>
</table>

**Lives in an urban area**

<table>
<thead>
<tr>
<th></th>
<th>ORs</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.05</td>
<td>(0.57 - 1.93)</td>
</tr>
</tbody>
</table>

**High-risk sexual behavior**

<table>
<thead>
<tr>
<th></th>
<th>ORs</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.33</td>
<td>(0.71 - 2.49)</td>
</tr>
</tbody>
</table>

**Lacked health insurance the year prior**

<table>
<thead>
<tr>
<th></th>
<th>ORs</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.94</td>
<td>(0.39 - 2.22)</td>
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</table>

**Usual Source of care**

<table>
<thead>
<tr>
<th></th>
<th>ORs</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.78</td>
<td>(0.42 - 1.45)</td>
</tr>
</tbody>
</table>

**Place of care**

<table>
<thead>
<tr>
<th></th>
<th>ORs</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private or HMO Office</td>
<td>REF</td>
<td></td>
</tr>
</tbody>
</table>

**Community/FP/School**

<table>
<thead>
<tr>
<th></th>
<th>ORs</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.55</td>
<td>(0.84 - 2.86)</td>
</tr>
</tbody>
</table>

**Employer clinic**

<table>
<thead>
<tr>
<th></th>
<th>ORs</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.85</td>
<td>(0.82 - 4.18)</td>
</tr>
</tbody>
</table>

*p<0.05; ** p<0.01; *** p<0.001
Table A6.5 Sensitivity Analysis excluding sexual minorities. Model 2: Logistic Regression of lifetime HIV test using an intersectional measure of race and SES among males 15-24 (n=478)

<table>
<thead>
<tr>
<th></th>
<th>Col 1: Interaction of race and income only</th>
<th>Col 2: Fully adjusted model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ORs</td>
<td>95% CI</td>
</tr>
<tr>
<td><strong>Race×Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NH White &gt;=100FPL</td>
<td>REF</td>
<td>REF</td>
</tr>
<tr>
<td>NH White &lt;100FPL</td>
<td>0.79</td>
<td>(0.37 - 1.70)</td>
</tr>
<tr>
<td>NH Black &gt;=100FPL</td>
<td>1.69</td>
<td>(0.71 - 4.03)</td>
</tr>
<tr>
<td>NH Black &lt;100FPL</td>
<td>0.68</td>
<td>(0.33 - 1.41)</td>
</tr>
<tr>
<td>Hispanic &gt;=100FPL</td>
<td>2.56</td>
<td>(0.92 - 7.16)</td>
</tr>
<tr>
<td>Hispanic &lt;100 FPL</td>
<td>1.06</td>
<td>(0.49 - 2.27)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-17</td>
<td>REF</td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>2.00</td>
<td>(0.95 - 4.23)</td>
</tr>
<tr>
<td><strong>Lives in an urban area</strong></td>
<td>1.04</td>
<td>(0.55 - 1.98)</td>
</tr>
<tr>
<td><strong>High-risk sexual behavior</strong></td>
<td>1.35</td>
<td>(0.69 - 2.6)</td>
</tr>
<tr>
<td><strong>Lacked health insurance the year prior</strong></td>
<td>0.83</td>
<td>(0.32 - 2.13)</td>
</tr>
<tr>
<td><strong>Usual Source of care</strong></td>
<td>0.76</td>
<td>(0.39 - 1.46)</td>
</tr>
<tr>
<td><strong>Place of care</strong></td>
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<td></td>
</tr>
<tr>
<td>Private or HMO Office</td>
<td>REF</td>
<td></td>
</tr>
<tr>
<td>Community/FP/School</td>
<td>1.43</td>
<td>(0.75 - 2.73)</td>
</tr>
<tr>
<td>Employer clinic</td>
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<td></td>
</tr>
<tr>
<td>Acute care setting</td>
<td>2.27</td>
<td>(0.98 - 5.23)</td>
</tr>
</tbody>
</table>

*p<0.05; ** p<0.01; *** p<0.001
<table>
<thead>
<tr>
<th></th>
<th>Complete case estimates</th>
<th>Estimates using multiple imputation</th>
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</thead>
<tbody>
<tr>
<td><strong>RacexIncome</strong></td>
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<td></td>
</tr>
<tr>
<td>NH White &gt;=200FPL</td>
<td>REF</td>
<td>REF</td>
</tr>
<tr>
<td>NH White &lt;200FPL</td>
<td>0.92 (0.40 - 2.12)</td>
<td>0.93 (0.40 – 2.12)</td>
</tr>
<tr>
<td>NH Black &gt;=200FPL</td>
<td>2.00 (0.90 - 4.45)</td>
<td>1.86 (0.82 – 4.84)</td>
</tr>
<tr>
<td>NH Black &lt;200FPL</td>
<td>0.55 (0.24 - 1.23)</td>
<td>0.57 (0.25 – 1.31)</td>
</tr>
<tr>
<td>Hispanic &gt;=200FPL</td>
<td>2.81 (0.73 - 10.77)</td>
<td>2.86 (0.79 – 10.33)</td>
</tr>
<tr>
<td>Hispanic &lt;200 FPL</td>
<td>1.05 (0.43 - 2.56)</td>
<td>1.00 (0.45 – 2.54)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-17</td>
<td>REF</td>
<td>REF</td>
</tr>
<tr>
<td>18-24</td>
<td><strong>2.18 (1.01 - 4.71)</strong></td>
<td><strong>2.05 (0.98 – 4.35)</strong></td>
</tr>
<tr>
<td><strong>High risk behavior</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lacked health insurance the year prior</td>
<td>0.92 (0.37 - 2.29)</td>
<td>1.46 (0.75 – 2.86)</td>
</tr>
<tr>
<td>Usual Source of care</td>
<td>0.73 (0.38 - 1.42)</td>
<td>0.88 (0.36 – 2.11)</td>
</tr>
<tr>
<td>Lives in an urban area</td>
<td>1.05 (0.56 - 1.96)</td>
<td>1.03 (0.56 – 1.90)</td>
</tr>
<tr>
<td><strong>Place of care</strong></td>
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<td></td>
</tr>
<tr>
<td>Private or HMO Office</td>
<td>REF</td>
<td>REF</td>
</tr>
<tr>
<td>Community/FP/School/ Employer clinic</td>
<td>1.62 (0.86 - 3.06)</td>
<td>1.58 (0.85 – 3.00)</td>
</tr>
<tr>
<td>Acute care setting</td>
<td>2.02 (0.89 - 4.59)</td>
<td>2.16 (0.95 – 4.90)</td>
</tr>
</tbody>
</table>

*p<0.05; *** p<0.01; **** p<0.001
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Curriculum Vitae

DAESHA V. RAMACHANDRAN

CONTACT INFORMATION

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Portland, OR 97215
503.505.3270
daeshar@gmail.com

EDUCATION

Doctor of Philosophy (September 2016)
Johns Hopkins University, Bloomberg School of Public Health
Department of Population, Family, and Reproductive Health
Concentration: Reproductive, Perinatal & Women’s Health
Methods concentration: Health Services Evaluation, Demography
Certificate in Maternal and Child Health

Master of Health Science, 2009
Johns Hopkins University, Bloomberg School of Public Health
Department of Population, Family, and Reproductive Health
Concentration: Reproductive, Perinatal & Women’s Health
Master’s thesis: Natal Family Characteristics Associated with Male-reported IPV

Bachelor of Science in Foreign Service, 2004
Georgetown University, Edmund A. Walsh School of Foreign Service
Major: Science and Technology in International Affairs (Environmental Studies)
Regional Focus: Latin America and Sub-Saharan Africa

PROFESSIONAL EXPERIENCE

March 2015 – Present Adolescent Sexual Health Equity Program Supervisor
Multnomah County Health Department, Portland, OR
- Oversee the strategic and operational direction of the program,
  including the management of eight staff members and a high-profile,
  politically charged $6.25 million teen pregnancy prevention grant;
- Cultivate and steward new and existing strategic relationships with key
  community groups and federal agencies, often bringing unlikely allies
  to the table towards a shared vision of adolescent sexual health
  services in the County.
May 2013 – March 2015 **Sr. Research & Evaluation Analyst**  
*Multnomah County Health Department, Portland, OR*

- Led planning, design and implementation of mixed methods process and outcome evaluations that yielded a 30% increase in client access to services, and new performance management metrics of clinical staff;
- Provided technical assistance and evaluation training that led to the adoption of more nimble, data-driven decision making among senior leadership and clinical management;
- Collaborated with external partners at multiple levels from insurance payers to community partners to ensure that approach to care remained client-centered and cost-effective.

2008 – 2014 **Research Assistant**  
*Johns Hopkins University, Baltimore, MD*

- Crafted funding proposals, analysis plans, survey instruments, training manuals concept notes, statistical reports, field guides, manuscripts and presentations;
- Performed advanced quantitative analyses including multivariate, longitudinal and multilevel data analyses for 10+ studies that yielded multiple peer reviewed publications and presentations at national and international conferences and journals;
- Managed international study teams, conducted site visits and ensured adherence to timeline and protocols.

2011 – 2012 **Research Associate**  
*Upstream Public Health, Portland, OR*

- Co-authored the first national Health Impact Assessment (HIA) on competitive foods policies in schools;
- Framed research scope, analysis plan, and recommendations on the impact of competitive foods policies on quality, outcomes and costs of school food programs;
- Findings led to federal policy changes in school food programs.

2009-2010 **Technical Consultant**  
*PanAmerican Health Organization (PAHO), Baltimore, MD*

- Designed and conducted complex multilevel analysis to assess HIV and STI prevalence, risk behavior, conditions affecting access to health services and other vulnerabilities among youth MSM across Latin American countries;
- Worked with an international team to author manuscripts and disseminate findings at international conferences.
2008 **Data Manager**  
*The Center for American Indian Health, Johns Hopkins University, Chinle, AZ*
- Performed quality assurance visits with field based staff to ensure fidelity to program design;
- Designed three-week training program based on Family Spirit Curriculum for the scale up and transfer of Family Spirit Program to Indian Health Services (IHS).

2006-2007 **Senior Associate, Corporate Relations and Foundation Giving**  
*The International Center for Research on Women, Washington, DC*
- Built the corporate relations fundraising program for ICRW, identifying unexplored areas of mutual interest between ICRW and corporations;
- Wrote winning grant proposals and secured donations from companies such as 3M, The Ford Foundation, and Google;
- Steward a multi-million-dollar grant portfolio, ensuring timely delivery of grants reporting and contracting.

2005-2006 **Senior Associate**  
*Development Resources, Inc., Arlington, VA*
- Developed strategies for organizational sustainability for non-profit organizations such as AARP, the Smithsonian, Freedom House;
- Performed market research and competitive analyses;
- Researched new funding opportunities and developed cultivation and solicitation strategies for major donors including individuals, corporations, and foundations.

2005-2006 **Consultant, HIV Fundraising and Partnerships**  
*The National Democratic Institute of International Affairs (NDI), Washington, DC*
- Used competitive analysis to develop cultivation and solicitation strategies for over fifty potential donors for HIV/AIDS Parliamentary Strengthening Program in Southern Africa;
- Developed key messaging and branding that aligned with program goals.

2005 **Program Manager**  
*Foundation for International Medical Relief of Children, Bangalore, India*
- As the first staff member in the country, built the India branch of this program, opening two primary care clinics for low-income families in less than four months;
Conducted needs assessments and built relationships with local communities to develop culturally responsive health education curricula for children and adults;
Hired and supervised staff of six and managed project budget.

List of Research Projects

Qualitative Studies

Sexual Health Equity for Youth with Intellectual and Developmental Disabilities
Role: Principal Investigator
Period: 2016-Present
Primary Objective: Use qualitative methods to assess the sexual health education needs of youth with I/DD in Multnomah County

Clinical Screening Practices for Teen Dating Violence Among Baltimore City Healthcare Workers
Role: Lead Student Investigator (PI: Decker, Johns Hopkins University)
Period: 2010-2013
Primary Objective: Used qualitative methods to evaluate the implementation of IPV screening policies and operations in family planning clinics in Baltimore City. Key methods used: In-depth interviews.

HIV prevention evaluation for female sex workers (FSWs) in Russia
Role: Student Investigator (PI: Decker, Johns Hopkins University)
Period: 2010-2013
Primary Objective: To conduct a mixed methods, external evaluation of AIDS Infoshare’s HIV prevention program, GLOBUS which provides outreach and education to commercial sex workers. Key methods used: Respondent-drive sampling and in-depth interviews.

PACOM Military Study
Period: 2011-2013
Role: Student Investigator (PI: Blum, Johns Hopkins University)
Primary Objective: To understand the mental health and educational needs of deployed families. Key methods used: Focus group discussions.

Gender Role Beliefs and Partner Selection: HIV/ STI Risk among urban youth
Period: 2010-2013
Role: Student Investigator (PI: Sherman, Johns Hopkins University)
Primary Objective: To assess the interrelationship between gender, race and class and the impact of these identities on sexual risk taking among Baltimore adolescents. Key methods used: In-depth interviews & multivariate regression analyses.
Advanced statistical methods

Racial and ethnic disparities in sexual risk behavior among young women in the U.S.
Role: Student Investigator (PI: Decker, Johns Hopkins University)
Period: 2012-2014
Primary Objective: Using a large nationally representative data set, to assess racial and class differences in sexual risk behavior among young women. Key method used: Multivariate regression analysis

Needle Exchange Among Baltimore City Injection Drug Users
Role: Student Investigator (PI: Sherman, Johns Hopkins University)
Period: 2010-2012
Primary Objective: Using mixed methods, to evaluate the impact of needle exchange policy on needle exchange practices in Baltimore City. Key methods used: Longitudinal multivariate analysis using generalized estimating equations

Fertility and Caregiving in Peri-Urban Egypt
Role: Lead Student Investigator (PI: Bishai, Johns Hopkins University)
Period: 2009-Present
Primary Objective: To assess the impact of family structure on fertility among peri-urban women in Egypt. Key methods used: Cox proportional hazards models, instrumental variables, biprobit models.

Shifts in fertility determinants among women in the Ecuadorian Amazon
Role: Student Investigator (PI: Pan, Johns Hopkins University)
Period: 2008-2010
Primary objective: Using geospatial techniques and multilevel modeling, to assess the relationship between fertility, migration and land ownership patterns over time. Key methods used: multilevel modeling and geospatial analysis.

Quality of Reproductive Health Care Services in Oromia Region
Role: Student Investigator (PI: Mitike, Addis Ababa University, Ethiopia)
Period: 2008
Primary objective: To identity barriers to and quality of sexual and reproductive health care for adolescent girls. Key methods used: Multivariate regression and qualitative analyses

Evaluations, systematic literature reviews & large-scale data projects

Astrazeneca Adolescent Health Study
Role: Student Investigator (PI: Blum, Johns Hopkins University)
Period: 2009
Primary objective: Using mixed methods to understand the major health concerns and barriers to health information and services and determine differences across world regions; with data collection in South Africa, Brazil, India, China, and the United States. Key methods used: systematic literature review.
How Contraceptive Use Affects Birth Intervals
Role: Student Investigator (PI: Amy Tsui, Johns Hopkins University)
Period: 2008
Primary objective: Assess the evidence base in the peer-reviewed literature review on the effects of contraception on neonatal morbidity and mortality. Key methods used: systematic literature review.

Men As Partners Endline Evaluation
Role: Student Investigator (PI: Kidanu, Miz Hazab Center, Addis Ababa Ethiopia)
Period: 2008
Primary objective: Evaluate the effect of gender empowerment program on changing gender norms among young men in Addis Ababa, Ethiopia. Key methods used: Multivariate regression and qualitative analyses

HONORS AND AWARDS

2009-2014 Sommer Scholarship; JHSPH’s highest award; selected based upon academic record and leadership potential; award provides tuition and stipend for five years of doctoral study

2010 - 2011 Maternal and Child Health & Epidemiology Training Grant; “Clinical screening practices for adolescent dating violence,” Baltimore, MD

2010 Native American Injury Prevention Grant; Johns Hopkins University School of Public Health, Department of Health Policy and Management. “Sexual violence among American Indians and Alaska Natives”

2009 Delta Omega Society; Alpha Chapter of the National Public Health Honor Society

2008 Graduate Travel Award, Bill & Melinda Gates Institute for Population and Reproductive Health. “Quality of Reproductive Health Care Services in Oromia Region.” Addis Ababa, Ethiopia

2004 Tropaia Speaker; Selected by peers to deliver commencement address to the students graduating with honors from the School of Foreign Service

PEER-REVIEWED PUBLICATIONS


MANUSCRIPTS IN PREPARATION


Decker MR, Ramachandran D, Minkovitz C, Miller E, Astone NM. “Sexual risk disparities among adolescent and young adult women in the US: race/ethnicity and SES.” (Submitted March 2015)


OTHER PUBLICATIONS


PEER REVIEWED PRESENTATIONS

2013


2012


2011


2010


2009


2008


OTHER PRESENTATIONS

2012


2009


TEACHING EXPERIENCE

2014

Community Based Participatory Research, Co-instructor
Two-day seminar – 24 public health professionals working in Native American Communities

2013

Fundamentals of Program Evaluation, Guest lecturer
2012
*Maternal and Child Health Policy and Legislation, Teaching Assistant*
8-week course – 55 graduate students
Graded assignments, met regularly with instructor to develop grading rubric

*Principles of Population Change, Teaching Assistant*
8-week course - 12 graduate students
Conducted weekly discussion groups, graded assignments, consulted with students

2010
*Qualitative Data Analysis, Course developer and Co-instructor*
1-week intensive course - 5 international research professionals
Designed curriculum and conducted lectures on qualitative data analysis; course focused on aspects of data collection, coding and analysis as well as manuscript preparation.

2009
*Fundamentals of Program Evaluation, Teaching Assistant*
8-week course—120 graduate students
Coordinated logistics for guest lecturers, graded course assignments, conducted weekly office hours, responded to student inquiries via e-mail

*Reproductive Health and Development, Teaching Assistant*
Intensive 2-week course—30 mid-career international students
Conducted lab-based tutorials; led the small-group discussion; prepared course materials

*Issues in Maternal Mortality Reduction in Developing Countries, Teaching Assistant*
8-week course - 115 graduate students
Coordinated logistics for guest lecturers; graded course assignments; conducted weekly office hours

*Demographic Methods in Public Health, Teaching Assistant*
8-week course - 35 graduate students
Conducted labs on demographic methods; assisted in design and content of assignments; coordinated logistics for guest lecturers; graded course assignments; held weekly office hours

**EDITORIAL ACTIVITIES**

2013  WHO Health Bulletin
2010  Qualitative Health Research

**PROFESSIONAL MEMBERSHIP**

2009-2014  Population Association of America
2012-2014  Academy of Violence and Abuse
INTER-ORGANIZATION/DEPARTMENTAL/UNIVERSITY SERVICE

2014 – 2015
Project review team: reviews human subjects research for Health Department projects prior to submission to State IRB, Multnomah County Health Department

Health System Transformation Policy Team: advises Director of Health Department on policy development in support of health systems transformation

2011 – 2013
Doctoral Admissions Committee, Department of Population, Family & Reproductive Health

2010 - 2013
Biostatistics Tutor, Department of Population, Family & Reproductive Health

RELATED PROFESSIONAL SKILLS

Media training, Microsoft Office Package, STATA, Atlas/ti, Nvivo, SPECTRUM, RDSAT, MPlus, MaxQDA, NetDraw, UciNet, R, EPIC