GEOGRAPHIC ACCESS AND UTILIZATION OF HIV TESTS AMONG BLACK MEN IN METROPOLITAN ATLANTA, GEORGIA

by

TIFFANY LYNNETTE PARR

(Under the Direction of Christopher Whalen)

ABSTRACT

INTRODUCTION: In 2010, the rate of new HIV infection was seven times higher in Black men than White men in the United States. Black men account for 74% of persons living with HIV/AIDS in Georgia. Twenty percent of persons with HIV are unaware of their infection due to not receiving an HIV test. **PURPOSE:** To determine what factors influence Black men's decision to obtain an HIV test in Fulton and DeKalb Counties of Georgia. **METHODS:** This mixed method study was comprised of three phases. Phase I was an ecological study that examined geographic access to publicly funded free HIV test sites by poverty and census tracts. Phase II was a cross-sectional design that used primary data collection methods to determine whether transit distance (miles) between participant's home address and the nearest publicly funded free HIV test site was associated with HIV testing in the past 12 months. Phase III was a qualitative study that used interviews to identify factors that affect Black men's decisions to seek HIV testing. **RESULTS:** In Phase I, census tracts with high proportions of Black men living below the poverty level had less transit distance to the nearest publicly funded free HIV test site than census tracts with Black men living at and above poverty ($p < .01$). In Phase II, of the 513 Black men, 285 (56%) had received an HIV test in the past 12 months. In a multivariate analysis, for every 1 mile increase in transit distance between a participant's home address and the nearest

publicly funded free HIV test site, Black men were 1% more likely to have an HIV test in the past 12 months (PR: 1.01, $p < .05$). Phase III revealed that 57% (n=15) of Black men reported that an HIV clinic was the most uncomfortable place to receive an HIV test. **CONCLUSION:** The most common barriers Black men faced when obtaining an HIV test were (a) judgment, and (b) privacy of test results. This study found that Black men were not utilizing publicly funded free HIV test sites due to the stigma of HIV clinics.

INDEX WORDS: HIV testing, Black men, Atlanta, Georgia, distance, barrier

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CHAPTER 1

INTRODUCTION

Public Health Significance

More than 34 million people are currently living with Human Immunodeficiency Virus (HIV), and since 1981, nearly 30 million people have died from the HIV infection (UNAIDS, 2012). At the end of 2010, the Centers for Disease Control and Prevention (CDC), reported that more than 1 million people are living with HIV in the United States, and nearly one in five (18–20%) of those individuals are unaware of their infection. Research shows that Black Americans are disproportionately affected by HIV, compared to other racial/ethnic groups. Some of the challenges that contribute to this disparity are poverty, distance to HIV test sites, stigma, and lack of awareness of HIV status. The following data reported by the Centers for Disease Control and Prevention (CDC, 2013), illustrates the disparity in the Black American community of HIV and the importance of addressing:

- Blacks make up approximately 14% of the United States population; however, 44% of all new HIV infections are among the Black population,
- Of the new HIV infections among adolescents and adults, Black men account for 70% (14,700),
- The incidence of HIV among Black men (103.6/100,000 population) was seven times as high as that of White men, twice as high as Latino men, and nearly three times higher than Black women.

These unsettling disparities are severely amplified for Black men in the United States. Access to an HIV test is essential for the prevention, treatment, and care efforts of HIV and

Acquired Immunodeficiency Syndrome (AIDS). HIV and AIDS are considered a health crisis and growing concern in the Black community.

Geographic Distribution of HIV

It has been well documented that the southern states of the United States has a higher infection rate of HIV than the rest of the United States. Although, the South accounts for 37% of the United States population, the incidence of HIV is the highest in the South (Reif, Whetten, Wilson, & Gong, 2012). Of the Southern States: Georgia, Alabama, Florida, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, and District of Columbia are hit the hardest by this deadly disease. From 2000–2009, Black males were frequently diagnosed at a rate that was 5 times that of White males and 3 times that of Hispanic males (Reif et al., 2012). Like many of the other southern states in the United States, HIV is a significant public health problem in Georgia.

As of 2010, there were 41,986 persons living with HIV and AIDS in Georgia. Additionally, in 2010, 66% of Georgians living with HIV and AIDS resided in the Atlanta Metropolitan Statistical Area (MSA; Georgia Department of Public Health, 2010). Fulton, DeKalb, Gwinnett, Cobb, and Clayton Counties are the five original counties of the Atlanta MSA and continue to be the core of Metropolitan Atlanta.

During 2010, the Fulton and DeKalb Health Districts reported the highest HIV prevalence in Georgia (Georgia Department of Public Health, 2011). The Georgia Department of Public Health (2011) reported that the overall state incidence rate for HIV in 2010 was 13.2 cases per 100,000 persons. In 2010, several Health Districts had HIV incidence rates that exceeded the state rate: DeKalb (37.3 per 100,000 population), and Fulton (28.2 cases per 100,000; Georgia Department of Health, 2011).

As mentioned and demonstrated earlier in this report, Black Americans are disproportionately affected by HIV. Blacks represent 30% of Georgia's population and account for 72% of persons living with HIV, compared with Whites who represent 65% of Georgia's population and account for 22% of persons living with HIV (Georgia Department of Public Health, 2010). According to the Georgia Department of Public Health, the majority (74%) of individuals living with HIV and AIDS in Georgia are male (Georgia Department of Public Health, 2010). Some of the key factors that may contribute to the high disparity of HIV infection, for Black Americans in DeKalb and Fulton Counties of Georgia, are residential segregation, access to free HIV tests, HIV-related stigma and HIV-related fear.

HIV Testing

A study conducted by the Henry J. Kaiser Family Foundation (2009) suggested that HIV testing rates among the United States Black population have flattened and possibly declined over time. National surveys found that the percentage of Blacks under the age of 65 who reported recent testing remained stable between October 1997 (39%) and March 2009 (40%; Henry J. Kaiser Foundation, 2009). A separate analysis of results from CDC-sponsored behavioral surveys suggests that testing rates among Blacks declined between 1999 and 2007 (Isbell, 2009).

Distance and HIV Testing Relationship

As researchers analyze HIV testing among the Black population, one should not overlook the relationship between distances to facilities that consistently offer free HIV test. A study conducted in Los Angeles, California, examined this relationship and found that the general populations in Los Angeles living at a greater distance from a publicly-funded HIV test site were less likely to ever obtain an HIV test, compared to those living closer to publicly-funded HIV test sites (Leibowitz & Taylor 2007). Leibowitz and Taylor (2007) found that when free HIV test

sites were less conveniently located, poor individuals went without testing entirely instead of testing elsewhere. Although evidence of the relationship between distance and HIV testing has been examined in Los Angeles, California, these results may not accurately reflect the association between distance and HIV testing among Black men since Leibowitz and Taylor (2007) study consisted of 11% Blacks and almost half of the study participants being female. There are currently no studies that have examined the relationship between distance to publicly-funded free HIV test sites and HIV testing among Black men in the United States. Additional research among this high-risk vulnerable population is warranted due to individuals not knowing their HIV status and HIV rates increasing among the Black male population.

As HIV and AIDS continues to disproportionately affect the poor, male, and Black communities, it is important to provide an ease of access to free HIV tests to increase HIV testing. In Georgia, from 2009 to 2010, the percentage of people living below the poverty level increased from 16.5% to 17.9% (U.S. Census Bureau, 2012). Researchers found that individuals living below the poverty level tend to be clustered in urban neighborhoods, rather than being evenly distributed across (Bishaw, 2011). Many publicly-funded HIV test sites provide free or low-cost (sliding scale based on income) HIV tests to low-income, homeless, unemployed, and uninsured persons (Solanki & Schauffler, 2000).

Gap in the Literature

Currently, no studies have examined the effect of distance (miles) to publicly-funded free HIV test sites on HIV testing among Black men. Limited studies have identified barriers and facilitators Black men face when obtaining an HIV from HIV test clinics. Therefore, this study examined geographic access to publicly-funded free HIV test sites; the utilization of HIV testing in the past 12 months, and identified optimal poor neighborhoods for free HIV test sites among

Black men. This study identified barriers and facilitators that influence the decision to obtain an HIV test among Black men.

Purpose of the Study

The purpose of this dissertation was to determine what factors influence Black men's decision to obtain an HIV test. The long-term implication of this study is to increase HIV testing among Black men. This study was implemented in DeKalb and Fulton Counties of Georgia, which are the two original counties that make up Metropolitan Atlanta. These two counties have the highest prevalence of HIV, which exceeds the state prevalence of 186 per 100,000. Georgia is amongst the top 10 states with the highest HIV and AIDS prevalence among Black men where70% of people living with HIV and AIDS live in Metropolitan Atlanta, and are Black males (70%). The findings from this study are translatable to other Counties, Cities and Districts with high rates of HIV among Black men such as District of Columbia, New Orleans, Baton Rouge, and Baltimore. These Cities and Districts are similar to DeKalb and Fulton Counties based on the percentage of Blacks living within these areas, the percentage of Blacks that account for HIV and AIDS cases and the percentage of Blacks living below the poverty level. This study is guided by the Andersen's Behavioral model (Andersen, 1968) and combines methodologies from various disciplines such as epidemiology, biostatistics, health promotion, and geography to create an integrative approach to the problem of geographic access and the use of HIV testing among Black men in DeKalb and Fulton Counties, Georgia. This study contributes to Healthy People 2020 objectives to (a) increase the proportion of adults who have been tested for HIV in the past 12 months; and (b) improve access to health services for health equity by (a) examining the geographic access to HIV test sites and use of HIV testing in the past 12 months, (b) identifying optimal poor neighborhoods for free HIV test sites, and (c) identifying

barriers Black men face when obtaining an HIV test. This research provides new information that should be used to identify and decrease barriers when obtaining an HIV test among Black men.

Design

A mixed-method design was conducted to examine the accessibility, availability, and acceptability of HIV tests among adult (18 years and older) Black men in DeKalb and Fulton Counties, Georgia. This dissertation comprises three phases (see Figure 1). Phase I is an ecological study that used secondary data to evaluate geographic access to publicly-funded free HIV test sites from neighborhoods with high concentrations of Black men living below the poverty level. The unit of analysis was census tract. Phase I was guided by two research questions: (a) Where are the highly clustered neighborhoods of Black men living below the poverty level located in DeKalb and Fulton counties, Georgia? (b) Does transit distance (miles) to publicly-funded free HIV test sites differ by poverty level among neighborhoods with high proportions of Black men?

Phase II is a cross-sectional design that used primary data collection methods to examine the effect of transit distance (miles) to publicly-funded free HIV test sites on HIV testing in the past 12 months among Black men in DeKalb and Fulton counties, Georgia. The Phase II unit of analysis was an individual and was guided by the research question: Are people living farther from the nearest publicly-funded free HIV test site less likely to have an HIV test in the past 12 months than people living closer to the nearest publicly-funded free HIV test site?

Phase III is a qualitative study that used in-depth interviews to identify factors that affect Black men's decisions to seek HIV testing. Phase III is guided by the research question: What individual and structural-level factors affect Black men's decision to seek HIV testing?

Specific Aims

Specific aims were guided by the research questions, which included the following:

Phase I: Ecological Study

Specific Aim 1: Determine whether transit distance to publicly-funded free HIV test sites differ between census tracts by poverty level among Black men in DeKalb and Fulton counties, Georgia.

Aim 1.1 Geographically locate census tracts with high proportions (> 50%) of Black men living below the poverty level.

Aim 1.2 Geographically locate publicly-funded free HIV test sites.

Aim 1.3 Geographically locate statistically significant clustered census tracts with high proportions (> 50%) of Black men living below (high poverty cluster) and above (low poverty cluster) the poverty level.

Aim 1.4 Assess the relationship between transit distance and poverty levels.

Aim 1.5 Compare transit distance (miles) to the nearest publicly-funded free HIV test sites with high proportions (> 50%) of Black men living *below* and *above* the poverty level.

Phase II: Cross-Sectional Study

Specific Aim 2: Determine whether the transit distance (miles) between a participant's home address and nearest publicly-funded free HIV test site is associated with HIV testing in the past 12 months.

Phase III: Qualitative Study

Specific Aim 3: Identify factors that influence adult (18 years and older) Black men's decision to seek and or not seek HIV testing.

In summary, limited research has been conducted to describe the geographical clustering of poverty among Black men and the distribution of publicly-funded free HIV test sites in DeKalb and Fulton Counties, Georgia. This dissertation (a) identified census-tract level clusters of poverty among Black men (b) compared the distance between publicly-funded free HIV test sites and neighborhoods with high concentration of Black men living below the poverty level; and (c) identified poor neighborhoods that do not have close access to free HIV test among Black men in DeKalb and Fulton Counties, Georgia. Few studies have examined the relationship of transit distance between publicly-funded free HIV test sites and the residence of Black men on the likelihood of HIV testing. Therefore, this dissertation (a) determined if transit distance is associated with HIV testing in the past 12 months; (b) identified independent predictors associated with HIV testing in the past 12 months; and (c) identified barriers and facilitators for obtaining an HIV test among Black men in DeKalb and Fulton Counties, Georgia. This dissertation provides information received from Black men concerning HIV testing and combines methods from multiple disciplines such as geography, epidemiology, biostatistics, and health promotion and behavior to determine the independent predictors and barriers of HIV testing.

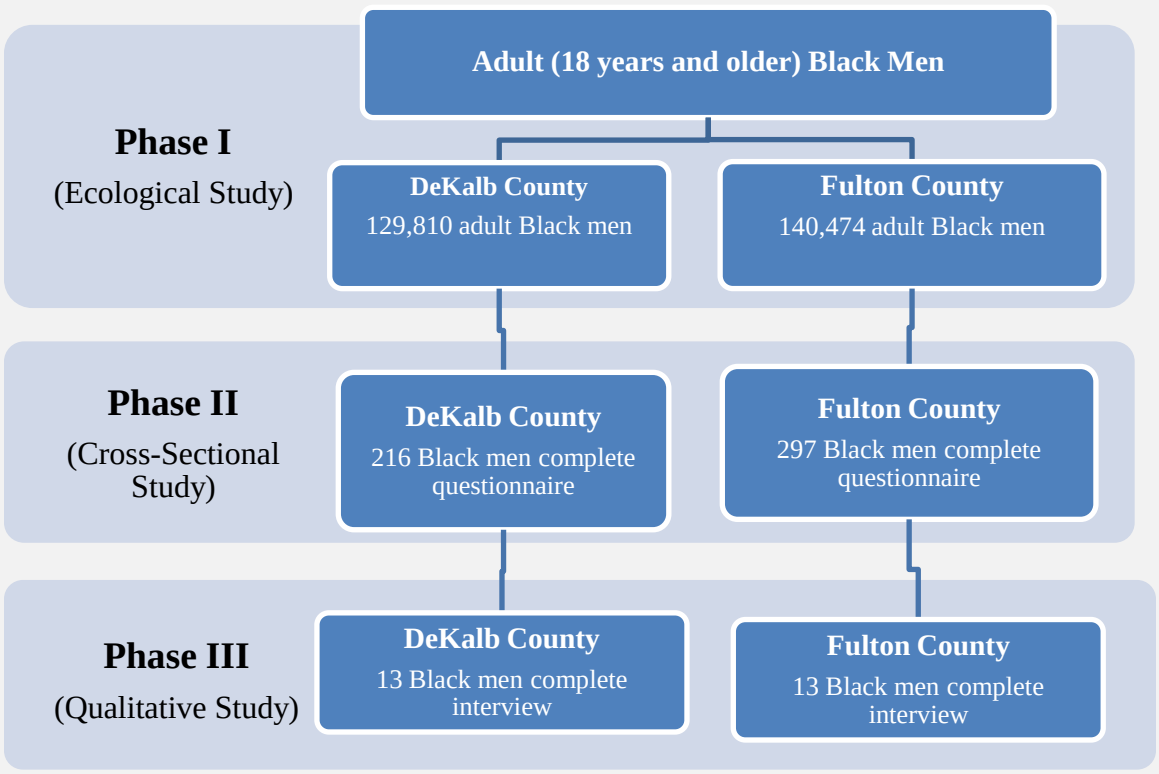

Figure 1. Study design flow chart.

CHAPTER 2

REVIEW OF LITERATURE

This chapter provides a review of the literature on epidemiological data concerning HIV among the Black population in the United States with a specific focus on DeKalb and Fulton counties in Georgia. This paper includes statistical data on HIV and AIDS among Black men and reviews relevant literature on HIV/AIDS risk factors, HIV testing, attitudes and perceptions about HIV risk, and HIV/AIDS-related stigma. This chapter will present Andersen's initial behavioral model (Andersen, 1968), which was used to inform specific aspects of this study to examine HIV test utilization. This model is useful because it allows for flexibility in choosing independent variables related to the specific aims (Willis, Glaser, & Price, 2010). At the conclusion of this chapter, the reader will have a better understanding of the importance of examining the effect that geography, specifically transit distance, has on HIV testing among Black men living in impoverished neighborhoods.

HIV and AIDS in the United States

CDC estimates that 1.1 million people in the United States are living with the HIV infection, with 50,000 new HIV infections annually (CDC, 2012e). In 2010, an estimated 47,129 persons were diagnosed with HIV infection and 33,015 people were diagnosed with AIDS (CDC, 2012d). The CDC estimates that 18% of those infected with HIV are unaware of their infection status and 34% are informed in the late stages of their HIV infection (Henry J. Kaiser Family Foundation, 2012). In 2010, the rate of new HIV infection among Black males in the United States was nearly 4.2 times more than Black females (7.3%; CDC, 2012a).

HIV and AIDS are considered a health crisis and a growing concern in the Black community. The HIV and AIDS epidemic has evolved from primarily affecting White individuals to primarily affecting the Black community (Johnson, Wei, Hu, & Dean, 2010). When compared with other races and ethnicities in the United States today, the latest surveillance data consistently demonstrate that Blacks are disproportionately affected by HIV and AIDS at all stages, from infection with HIV to death due to AIDS (Johnson et al., 2010). In 2010, Black Americans accounted for 44% of the new HIV infections, followed by Whites (31%) and Hispanics/Latinos (21%; CDC, 2012a). In 2010, Black men accounted for 70% (14,700) of the estimated 20,900 new HIV infections among all adults and adolescents (CDC, 2013). The estimated incidence of HIV infection for Black men (103.6/100,000 population) was seven times as high as that of White men, twice as high as that of Latino men, and nearly three times as high as among Black women (CDC, 2013).

It was further observed that the rate of new HIV infections for Black women (38.1/100,000 population) was 20 times higher than for White women, and almost five times as high as that for Latinas (CDC, 2012d). In 2010, Black women accounted for 6,100 (64%) of the new estimated HIV infections among all adult and adolescent Blacks (CDC, 2012d). There is noteworthy news on the horizon for Black women regarding the progression of HIV. A recent CDC analysis has showed that there has been a 21% decrease in new HIV infection among Black women (CDC, 2012g).

The risk groups that are disproportionately affected by HIV are homosexual men, and bisexual men of all races and ethnicities among Blacks and Hispanics/Latinos (CDC, 2012d). According to the CDC's HIV Surveillance Supplementary report for 2007 through 2010, at the end of 2008, 72% of adults and adolescents living with a diagnosis of HIV infection were male

and 28% were female (CDC, 2012d). In 2010, young Black males between the ages of 13–24 accounted for more than half (57%) of new HIV infections (CDC, 2012d). It was also reported that in the United States, 64% of infections were attributed to male-to-male sexual contact in adult and adolescent males (CDC, 2009). As of 2009, heterosexual exposure accounted for 87% and 69% of new HIV cases, respectively, among Black women and Black men (CDC, 2009).

When reviewing morbidity, it was observed that there were signs of disparity in the Black American community. In 2009, the rate of AIDS deaths was the highest among Blacks/African Americans (29.3 cases per 100,000 persons) compared to Whites (2.4), Hispanics/Latinos (5.4), and American Indians/Alaska Natives (3.4; CDC, 2012f). Further review of the literature showed that in the United States there were 17,774 people with an AIDS diagnosis that died in 2009. Of the 17,774 persons 50% who were Black American followed by 16% who were Hispanic/Latino (CDC, 2012d). Additional analysis is needed to understand the full extent of disparity that Black Americans face, concerning the imbalance in HIV infection. Only then can one possibly uncover the strategy to support the efforts to decrease HIV infections in this population.

HIV and AIDS in the Southern Region of the United States

The Southern Aids Coalition, Southern State Manifesto: Update 2012 recognizes that there is a great disparity as it pertains to HIV and AIDS in the Southern United States. The southern region is experiencing the highest HIV infection and mortality rates in the country. Southern AIDS Coalition (SAC, 2012) members are comprised of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia and the District of Columbia. Data also included Delaware and Maryland as part of the southern region and were approved by the CDC for these purposes, and thus were added to the SAC jurisdictions (SAC, 2012). While the Southern region

of the United States only accounts for 37% of the population, the Southern States accounts for nearly 50% of new HIV infections (SAC, 2012). Additionally, those living in the South are dying faster than any other region of the country.

The SAC (2012) reported that out of the ten states with the highest rates of HIV, eight were located in the south. The HIV infection incidence rate of 22.3 per 100,000 in the South is highest of any region. The CDC reports that AIDS diagnosis is also the highest by region in the South (14,722 in 2010), followed by the Northeast (7,842). Further analysis of AIDS diagnosis shows that when one takes into consideration the sizes of the population (number of diagnoses per 100,000 people) the highest is in the Northeast (CDC, 2012). According to the SAC (2012) in the past 30 years, HIV/AIDS has had a disproportionate and devastating impact on Black communities in the South.

The manifesto disclosed that there were several social and economic factors that were found to contribute to this disparity in the South, those being, poverty level, access to healthcare, uninsured individuals, HIV stigma, lack of awareness of HIV status, and rural geography. Reif et al. (2012) stated that there may be factors that contribute to the impact of HIV in the south. According to Reif et al. (2012) the southern United States has the 1) highest level of poverty; 2) worst overall health ranking; 3) disparities of poverty among Blacks, and 4) high HIV-related stigma. Evidence tends to support the concept that HIV remains mainly an urban disease.

Atlanta Metropolitan Area

In 2010, 66% of Georgians living with HIV and AIDS resided in the Atlanta Metropolitan Statistical Area (MSA; Georgia Department of Public Health, 2010). The Atlanta Metropolitan area (Metro-Atlanta), officially designated by the U.S. Census Bureau as the Atlanta-Sandy Springs-Marietta MSA, is the most populous metropolitan area in the State of

Georgia and the ninth largest MSA in the United States. The U.S. Census Bureau identified Fulton, DeKalb, Gwinnett, Cobb, and Clayton Counties as the five original counties of the area and continue to be the core of the metropolitan area. Blacks/African Americans are the largest racial minority group in the metropolitan area. At the end of 2008, the metropolitan area reported 22,072 cases of HIV (433.9 cases per 100,000 persons) and 13,148 AIDS cases (254 cases per 100,000; CDC, 2009).

HIV and AIDS in Georgia

According to the Georgia Department of Public Health (2011) *HIV/AIDS Surveillance Fact Sheet*, Georgia is ranked sixth in its number of AIDS cases through 2009, and in 2010. In 2010, Georgia had 40,328 living with HIV/AIDS (Georgia Department of Public Health, 2011). The Georgia Department of Public Health reported in 2010 that Georgia was among the 10 states with the highest HIV and AIDS rates, with 40,328 persons living with HIV/AIDS in Georgia. Further research showed that Blacks represent 31% of Georgia's population and account for 77% of persons living with HIV, compared to Whites who represent 65% of Georgia's population and account for 22% of persons living with HIV (Georgia Department of Public Health, 2010). In addition, it was also reported that the majority (75%) of persons diagnosed with HIV and AIDS in Georgia are male (Georgia Department of Public Health, 2010).

Further HIV analyses provided statistics on the age frequency, and the prevalence of HIV and AIDS reported in four of Georgia Health Districts (DeKalb, Fulton, Clayton, and Dublin counties; Georgia Department of Public Health, 2010). The new cases of HIV and AIDS were among the population of 30 to 49 years of age (Georgia Department of Public Health, 2010). In 2010, the Georgia Department of Public Health reported HIV prevalence in Georgia was 187.1 cases per 100,000 persons. DeKalb health district of Georgia reported the highest HIV

prevalence (510.2 cases per 100,000), Fulton County had the second highest HIV prevalence in Georgia (476.5 cases per 100,000), and Clayton County followed (365.8 cases per 100,000 HIV prevalence). Table 1 shows the HIV prevalence by health district in Georgia.

Table 1. Persons living with HIV by current public health district of residence, Georgia, 2010

Public health district	HIV cases	Prevalence/100,000
DeKalb	3,530	510.2
Fulton	4,387	476.5
Clayton	949	365.8
South Central (Dublin)	360	233.1

Source: Georgia HIV/AID Surveillance Summary, by Georgia Department of Human Resources, Division of Public Health, 2010, retrieved from http://health.state.ga.us/pdfs/epi/hivstd/2012_Surv_Summary.docx

Factors that Influence HIV and AIDS among Blacks

The elevated rate of HIV and AIDS among the Black population is attributed to multiple interacting contextual factors: high rates of men having sex with men, ratio imbalance of men to women, high incarceration rates, neighborhood segregation, poverty, and high rates of illicit drug use (CDC, 2010; Gaiter & O'Leary, 2010; Pouget, Kershaw, Niccolai, Ickovics, & Blankenship, 2010; Senn, Carey, Vanable, Urban, & Sliwinski, 2010; Williams & Prather, 2010). The most commonly reported transmission category among men living with HIV in Georgia was male-to-male sexual contact (51%), and 55% for men living with AIDS in Georgia (Georgia Department of Public Health, 2010). The cause of twenty-two percent of females living with HIV and 36% of females living with AIDS were attributed to heterosexual contact (Georgia Department of Public Health, 2010).

LGBT Community in Atlanta

In 2012, the Atlanta Journal Constitution (AJC), which is the only major daily newspaper in the Metropolitan area of Atlanta, stated "The City of Atlanta has one of the highest lesbian, gay, bisexual, transgender community (LGBT) populations per capita in the United States."

Atlanta not only contains the largest populations of gay, lesbian, and bisexual people, it also has one of the largest populations of gay Black men in the United States. With a multitude of gay bars, clubs, and churches, Atlanta's "homosexual friendly" atmosphere may be a contributing factor to why so many homosexual and bisexual individuals relocate to Atlanta.

LGBT is another group that has been disproportionately affected by HIV and AIDS. Men who have sex with men (MSM) remain the population greatly affected by the HIV infection. In 2010, male-to-male contact represented 51% of new HIV infections among Black Americans and 72% of that number were among Black men (Henry J. Kaiser Family Foundation, 2013). MSM aged 13–24 represented over 55% of new HIV infections (Henry J. Kaiser Family Foundation, 2013). In regards to the lesbian population, CDC reports that at this date, there are no confirmed cases of female-to-female sexual transmission of HIV in the United States. Women are more likely to be infected by heterosexual contact and injection drug use (CDC, 2006).

Men having Sex with Men (MSM)

As we take a closer look at Black MSM, Millett, Wolitski, Stall, and Peterson (2006) reported the following factors: (a) Black MSM are less likely than MSM of other racial/ethnic groups to engage in unprotected anal intercourse: and (b) Black MSM had the same number or fewer male sexual partners than White MSM. If this is the case, the question then becomes, "Why is the Black MSM population more susceptible to HIV than their White counterparts?" Data have revealed that Black MSM are tested less frequently and at later stages of their HIV infection (Millett et al., 2006). Additionally, it has been noted that Black MSM are less likely to be aware of their HIV-positive status than MSM of other racial/ethnic groups (CDC, 2012b).

The lack of knowledge of their HIV status for Black MSM has led to a delay in treatment and obtaining antiretroviral treatment (ART), as well as unknowingly exposing others to HIV.

ART medications are used to support treatment of HIV-infected persons. Further research has shown Black MSM to have higher rates of other sexually-transmitted infections (STIs) such as syphilis, gonorrhea, and chlamydia that can facilitate the transmission and acquisition of HIV (CDC, 2008). Syphilis, like many other STIs, facilitates infection with HIV, increasing transmission of the virus two to five fold (CDC, 2008).

Partner Selection

The relative availability of male and female partners in a population is reflected in the male-to-female sex ratio measure, by convention, as the number of men per 100 women (Guttentag & Secord, 1983). The Black population in the United States has a low sex ratio of men to women, 91.8 men per 100 women in the reproductive age range from 15 to 49 years of age (Pouget et al., 2010). Whites and Hispanics in this age range reflect a surplus of men with sex ratios of 101.9 and 112.8 per 100 women, respectively (Pouget et al., 2010). In the Georgia metropolitan-Atlanta area (Atlanta-Sandy Springs-Marietta), the sex ratio of Blacks 15 to 54 year old is 86.7 men per 100 women compared to 104 White men to 100 White women in the same age range (U.S. Census Bureau, 2011).

Research has shown that a ratio imbalance of men to women has proven to be a strong factor in the increase of HIV/AIDS with Black MSM. A hypothesis could be made that one reason disparities increase regarding HIV/AIDS between Black MSM and other racial groups are because African-American women typically outnumber African-American men. In addition, African-American men experience higher rates of incarceration and premature death (Senn et al., 2010). The rate acquisition of opposite-sex partners can be influenced by the availability of these partners (Pouget et al., 2010).

The number of sexual partners is a principal determinant of the likelihood of acquiring HIV infection and other STIs (R. Anderson & May, 1991). Laumann, and Youm (1999) examined the possible causes of why African-Americans have such a high rate of STIs. Their research provided two possible conclusions concerning the higher rate of bacterial disease, which was associated with sexual networking. First, "because partner choices is more highly distortive," meaning that peripheral African-American (who have had only one partner in the past year), are 5 times more likely to choose "core" African-Americans (who have four or more partners in the past year), than peripheral Whites are to choose "core Whites" (Laumann & Youm, 1999). Secondly, African-Americans tend to choose their sexually partner from within their own race, therefore promoting sexual transmission within the African-American population, where partner choices can be more segregated in other racial/ethnic groups (Laumann & Youm, 1999).

To further investigate sex ratios and its effect on sexual partners, social-exchange theory can be revealing in this area. According to this theory, "Satisfaction with sexual and social relationships depends upon prior expectations, comparison with alternatives, investments made in the relationship, and the perception of reciprocity" (Sprecher, 1998, p. 32). Through this perspective, male shortage can be viewed as increasing the bargaining power of men and reducing the bargaining power of women in intimate relationships, and for reducing the available alternative relationships for women and increasing the available alternative relationships for men (Pouget et al., 2010). There have been several qualitative studies that have examined the sex ratio among Black individuals as a potential determinant of concurrent sexual relationships and HIV/STI risk (Adimora & Schoenbach, 2002; Adimora et al., 2002; Lane et al., 2004). These studies suggest that male shortage as well as high rates of incarceration, unemployment, and

poverty, with roots in racial discrimination, support partnership concurrency and lead to more dense sexual networks and higher rates of HIV and STI transmission (Adimora & Schoenbach, 2002; Adimora et al., 2002; Lane et al., 2004).

High Incarceration Rates

An examination of incarceration demonstrates another factor of disparity among Black Americans concerning the prevalence of HIV and AIDS compared to other racial/ethnic groups. Research reveals Black Americans are three to five times more likely to be incarcerated. Individuals incarcerated have three to five times higher probability to have HIV/AIDS than the general population (Harawa & Adimora, 2008). According to Adimora et al. (2003), Khan, Miller, et al. (2008), and Khan, Wohl, et al. (2008), research indicated that having a partner incarcerated increases the possibility of multiple concurrent and transactional sex partners, which adversely affects the likelihood of having an HIV/STI diagnosis. In the United States, 1 in 15 Black men aged 18 and older have been incarcerated, compared to 1 in 106 White men in the same age range (Sabol, Minton, & Harrison, 2006). Georgia Department of Corrections (GDOC, 2009) has provided several statistics on the incarceration of the Black male:

- Georgia's prison incarceration rate is 5.8 per 1,000 residents,
- Blacks comprise 61.72% of the 55,321 individuals incarcerated in the State of Georgia and
- Males comprise 95% of the incarcerated population in Georgia.

Further evidence reported by GDOC (2010a) has shown that in 2010, there were 52,291 prison inmates in the GDOC; 48,570 were male and 32,868 were Black. The method GDOC used in accumulating data on the inmate's residence was obtained before entry into prison. The following information was captured from the self-reported reports: in 2010, the top four counties

represented among this population were Fulton (2,339), DeKalb (1,175), Cobb (1,120), and Chatham (936; GDOC, 2010b). In 2010, of the 19,504 male inmates in Georgia, 363 tested positive for HIV; 17,997 inmates tested negative; and for 1,144 inmates, their HIV status was not reported (GDOC, 2010b).

In 1988, the GDOC initiated mandatory HIV testing of inmates upon entry and voluntary HIV testing upon request or if clinically indicated (South, 2009). In 2009, Georgia passed a bill that stated:

> The department shall implement an HIV testing program whereby any state inmate who has been in the custody of a state penal institution for one year or longer and who has not previously tested positive for HIV shall be tested for HIV within 30 days prior to his or her expected date of release from the custody of the department. (Testing of Prison Inmates for HIV, 2010)

High incarceration rates among Black men have resulted in strong consequences when inmates are released. Black men who have been incarcerated face high levels of rejection when job seeking; therefore, leading to high unemployment rates. Today an individual who has been incarcerated will, more than likely, have to search for work in the service sector; yet employers are less likely to hire them because they have to come into contact with the public (Wilson, 2008). Results show that initially, unemployment may prompt illegal money-making activities that result in incarceration, which then leads to even more intractable unemployment (Wilson, 2008). Research has proven that high rates of unemployment are associated with incarceration, which is associated with the risk of HIV transmission (Gaiter & O'Leary, 2010; Williams & Prather, 2010).

HIV Testing

HIV Testing in the United States

Approximately 20% of the estimated 1.2 million persons living with HIV infection in the United States at the end of 2008 were not aware of their infection status (CDC, 2011a). This percentage of undiagnosed HIV cases may be due to individuals never receiving an HIV test or because they have not had a recent HIV test (Bond, Lauby, & Batson, 2005). Among adults over the age of 17 reporting a risk factor for HIV infection in the 1999 National Health Interview Survey, 27.3% reported they had never obtained an HIV test (CDC, 2001).

In October 2007, the CDC initiated the expanded 3-year HIV Testing Initiative through which it funded 25 health departments to facilitate HIV screening and increase diagnoses of HIV infections and linkage to care among populations disproportionately affected by HIV, especially non-Hispanic Blacks (CDC, 2011b). According to CDC (2011b), between October 2007 and September 2010, a total of 2,786,739 HIV tests were performed, of which 29,503 (1.1%) were positive for HIV infection (CDC, 2011b). Further evidence showed that among persons who were HIV-infected, 18,432 (62%) were unaware of their infection. The data showed that men accounted for 55% of all HIV tests and 72% of new HIV diagnoses (CDC, 2011b). CDC (2011b) results showed: (a) a test positivity rate for men was more than double that among women (0.9% versus 0.4%); (b) the test positivity rate among Blacks (0.8%) was 1.6 times that among Whites (0.5%) and Hispanics (0.5%); (c) non-Hispanic Blacks, compared with non-Hispanic Whites and Hispanics, accounted for approximately three times as many tests (60% versus 18% and 16%, respectively).

According to CDC (2011b), 90% of tests were conducted in clinical settings, and 10% in nonclinical settings. Emergency departments identified 32% of all new HIV diagnoses; sexually

transmitted infection (STI) clinics diagnosed 20% of new HIV infections; and substance-abuse clinics were responsible for 0.9% of new HIV diagnoses (CDC, 2011b). Community-based organizations, which performed targeted testing based on risk and accounted for the majority of tests performed in nonclinical settings, accounted for 11% of new diagnoses (CDC, 2011b). Community-based organizations also produced the highest test-positivity rate for new HIV diagnoses (1.2%), but the largest numbers of new diagnoses came from clinical settings, where lower test positivity rates (e.g., 0.8% for emergency department and 0.6% for STI clinics) were offset by the larger numbers of persons screened (CDC, 2011b). In 2006, CDC recommended screening of patients aged 13–64 years for HIV infection in healthcare settings that have a prevalence of undiagnosed HIV infection of >= 0.1% (Branson et al., 2006).

In 2010, 84% of person in the United States received an HIV test from a health care facility such as a private doctor office, and 16% received an HIV test from a non-health care facility such as an AIDS clinic. Eighty percent received an HIV test from non-primary publicly funded test site and 20% received an HIV test from publicly funded test sites such as an HIV/ STI clinic (CDC, 2013).

HIV and AIDS Treatment

When discussing the treatment of HIV/AIDS, an introduction to Highly Active Antiretroviral Therapy (HAART) is necessary. In 1996 health outcomes among people living with HIV/AIDS improved dramatically. Recognition was given to HAART as assisting in the lowering of viral loads, which have been linked to reduced probability of transmission (Ho, 1996). Viral load is the term used to describe the level of HIV in the blood. HAART has also created new challenges in HIV primary and secondary prevention (Lightfoot, Swendeman, Rotheram-Borus, Comulada, & Weiss, 2005). Evidence suggested that many persons living with

HIV believe the sexual behaviors that could lead to transmission of HIV (i.e., unprotected sex) are less risky if viral load is suppressed and the probability of transmission is lower (Vanable, Ostrow, McKirnan, Taywaditep, & Hope, 2000). There is also evidence that transmission behaviors have increased among persons living with HIV since the introduction of HAART (Vanable et al., 2000). Although, HAART may allow individuals to better manage the disease, HIV-positive and -negative individuals should not consider themselves unable to contract the infection or immune from it progressing to AIDS.

HIV and AIDS Prevention

Pre-exposure prophylaxis (PrEP) is a new HIV prevention method that allows HIV negative individuals to take a daily pill orally in combination with other preventative measures such as condom usage, and regular HIV and STI testing to reduce the risk of sexually acquired HIV infection in adults. The once a day oral pill is known as Truvada (emtricitabine and tenofovir disoproxil fumarate) and is a combination of EMTRIVA and VIREAD. FDA approved Truvada in 2004 for use in combination with other anti-retroviral medications to treat HIV-infected adults and children over 12 years of age. Clinical trials have provided evidence indicating that PrEP, when used consistently (once a day) and in combination with other preventative measures such as regular HIV testing and condom usage, it is safe and effective for reducing the risk of acquiring HIV sexually (Baeten JM et al., 2012;Thigpen MC et al., 2012). Among adult MSM and heterosexually active men and women, CDC recommends for Physicians to prescribe no more than a 90 day supply of Truvada and to not renew another prescription, until administering an HIV test and confirming the individual has remained HIV negative (CDC, 2012j). CDC has also recommended that anyone taking Truvada must obtain an HIV test every 2-3 months and a bacterial STI test every 6 months (CDC, 2012j). The importance of regularly

receiving an HIV test is of high importance since the medication is for high risk HIV negative individuals. If one becomes HIV positive, HAART will then be implemented.

HIV Testing in Georgia

Georgia identifies HIV and AIDS as diseases of public health importance and requires both healthcare providers and laboratories to report cases of HIV and AIDS (Georgia Department of Public Health, 2010). Names and other identifying information are required for all reportable diseases. The CDC only accepts data from surveillance systems that use names as an identifier (Georgia Department of Public Health, 2010). Anonymous testing is available throughout Georgia at publicly-funded HIV counseling and testing sites, which include local health departments. Georgia County Health Department offers HIV counseling and testing services in publicly-funded facilities in Georgia.

The services include:

- HIV antibody testing: Testing routinely done on blood samples. Some sites offer oral testing and/or provide same-day results,
- HIV prevention counseling: Helping individuals address HIV risk reduction, and
- Referrals (including access to medical care for persons who test positive; Georgia Department of Human Resources, 2003).

As of 2003, there were 321 active programs in Georgia's standardized HIV counseling and testing system (CTS), which included all county and district health departments, publicly-funded clinics, jails and juvenile detention centers, university-student health clinics, and various outreach projects (Georgia Department of Public Health, 2003). The CTS data are standardized for clients who are tested for HIV. Data collected include demographics, test results, testing history, and exposure risks (Georgia Department of Public Health, 2003). The data are submitted

to the state HIV Prevention Section in the Georgia Division of Public Health without personal identifiers (Georgia Department of Public Health, 2003). In 2002, 87,186 HIV tests were performed in Georgia's CTS. Forty-two percent of the HIV tests were obtained by men, 61% by Blacks, and 41% were those between the ages of 20 and 29 (Georgia Department of Public Health, 2003).

The Behavioral Risk Factor Surveillance Survey is a state-based, random-digit-dialed telephone survey that monitors behavioral risk among the general adult population. Respondents are contacted by telephone and inferences are made at the state level. In 2002, the survey found that 55% of men in Georgia reported ever being tested for HIV (Georgia Department of Public Health, 2003). White men were the least likely to report an HIV test with 49% compared to Black men at 71% (Georgia Department of Public Health, 2003). The most common reason reported for having an HIV test was "routine medical check-up" (28%), followed by "just wanting to know" (22%; Georgia Department of Public Health, 2003). Most respondents had their last test at a private doctor's office (48%) or at a clinic (21%; Georgia Department of Public Health, 2003). Counseling and testing sites were less frequently reported as the location of the most recent HIV test (Georgia Department of Public Health, 2003).

Barriers to Seeking Treatment for HIV Testing

Barriers that individual's encounter when seeking HIV treatment are unrecognized infections, healthcare availability, acceptability, and accessibility. The link between healthcare accessibility and HIV testing is especially important to examine in light of the fact that in the United States, the majority of HIV tests are performed at medical health care setting and not at publicly-funded HIV test sites (J. Anderson, Brackbill, & Wilson, 2000). In general, academic medical clinics serve a unique patient population characterized by an increased percentage of

minorities, fewer years of formal education, poorer health literacy, and lower incomes (Stefan et al., 2010). Patients in these clinics are at higher risk for contracting HIV, as the HIV epidemic is known to affect minorities disproportionately such as young adults and socioeconomically disadvantaged persons (Chaisson, Keruly, & Moore, 1995; Karon, Fleming, Steketee, & De Cock, 2001).

Men, in particular, may face unique barriers in accessing routine health care, as they are less likely than women to have health insurance, have a usual source of care, or go to the doctor periodically for routine or preventive health care (Culica, Rohrer, Ward, Hilsenrath, & Pomrehn, 2002; Weinick, Zuvekas, & Drilea, 1997). Bond et al. (2005) showed that compared to men who made zero visits to the doctor in the past year, men who made 1–3 visits were nearly four times as likely to have ever received a HIV test.

Availability, Acceptability, and Accessibility of HIV Testing

The policy environment plays a central role in the emergence and control of the HIV and AIDS epidemic (Poundstone, Strathdee, & Celentano, 2004). Structural-level health policies governing prevention, treatment, and care can contribute to dramatic reductions in HIV/AIDS incidence (Poundstone et al., 2004). The literature suggests that structural factors influence health in three contextual ways: availability, acceptability, and accessibility (Blankenship, Bray, & Merson, 2000). Availability assumes that necessary preventive HIV resources are available for at-risk individuals (Blankenship et al., 2000; Plowden, Fletcher, & Miller, 2005). Acceptability focuses on changing the norms of the social system (Blankenship et al., 2000; Plowden et al., 2005). Accessibility focuses on equal distribution of resources throughout communities (Blankenship et al., 2000; Plowden et al., 2005). Poverty often limits access to HIV testing and

treatment. For those with access to treatment and disposable income, AIDS can be a manageable chronic condition (United Nations Population Fund, 2009).

Even where HIV tests and antiretroviral drugs are free, many patients have to pay considerable "out-of-pocket" costs for transportation, tests, and treatments for opportunistic infections (United Nations Population Fund, 2009). Health care in the United States is principally funded through private insurance payments (Avert, 2011). Therefore, those who do not have health insurance may have to be insured by the government through state Medicare or Medicaid, or remain uninsured and pay for every individual treatment or consultation they receive (Avert, 2011). Two-thirds of United States African-American population rely on publicly-funded programs (i.e., Medicaid) compared to half of HIV-positive people as a whole (Avert, 2011). If eligible, African-Americans patients may utilize the Ryan White Care program resources, the largest federally-funded program dedicated to providing treatment for people living with HIV/AIDS. This program also finances the AIDS Drugs Assistance Program, which provides drugs to those who do not qualify for Medicaid or Medicare, and could not afford private health insurance (Avert, 2011).

Additionally, it has been observed that the allocation of resources for health services can vary in low socioeconomic urban areas. Cost of treatment and not having access to free medical-care clinics result in Blacks not visiting a hospital or physician until they are seriously ill (Avert, 2011). When people postpone seeking medical attention and continue to engage in sexual activities, they place themselves and their community at risk of infection through the sexual and social networks of the neighborhood (Heffernan, 2002). Postponing medical attention increases the prevalence and incidence of HIV/AIDS in the community (Heffernan, 2002). Making

HIV/AIDS resources available, acceptable, and accessible are essential factors to reduce HIV and AIDS among Black males.

Benefits of Testing

Benefits of HIV testing for persons infected with HIV are greater now than at any time in the history of the epidemic (Bond et al., 2005). Persons who learn they have HIV can receive appropriate treatment, and maintain health care, while delaying disease progression to reduce the chance that they will transmit the virus to others (CDC, 2011a). During the past 2 decades, survival rates for HIV and AIDS have improved dramatically (Palella, Deloria-Knoll, & Chmiel, 2003), but advances in early diagnosis of HIV have been modest (Stefan et al., 2010).

Geography and HIV Testing Utilization

Although geography has been recognized as an important determinant of health for over a century, analysis of spatial characteristics of health and illness has increased in the last 20 years (Gordis, 1996; Snow, 1855). Geographic Information Systems (GIS), Geospatial software, and Google Maps have provided public health professionals with the means to: (a) determine the geographic distribution and variation of disease (Kalipeni & Zulu, 2008); (b) map populations at risk and stratify risk factors (Heimer, Barbour, Shaboltas, Hoffman, & Kozlov, 2008); (c) document healthcare needs of a community and allocate resources (Kaukinen & Fulcher, 2006); (d) forecast epidemics (Kandwal, Garg, & Garg, 2009); and (e) calculate driving distance and time to hospitals, clinics, and other healthcare facilities (Leibowitz & Taylor, 2007).

Distance to HIV test sites has important implications for patient decision-making and healthcare utilization. Accessibility of healthcare in the geographic location of health services is an important factor in healthcare utilization. Leibowitz and Taylor (2007) found that lower income residents of Los Angeles, California, living farther from the nearest publicly-funded HIV

sites, were significantly less likely to obtain an HIV test in a 2-year period. Leibowitz and Taylor (2007) also showed that when publicly-funded free or low-cost HIV test sites were less conveniently located, poor individuals went without tests entirely instead of testing elsewhere. There have been no previous studies in Georgia that examined the effect of distance to free HIV test sites on HIV testing.

According to the American Community Survey (ACS), the national poverty rate increased from 14.3% in 2009 to 15.3% in 2010 (Bishaw, 2011). The number of individuals living below the poverty level is increasing, and HIV/AIDS remains a public health concern in the United States. Individuals living below the poverty level tend to be clustered in certain neighborhoods rather than being evenly distributed across geographic areas (Bishaw, 2011). Because of the driving distance, the cost of travel to HIV test sites may affect an individual's decision to obtain an HIV test (Leibowitz & Taylor, 2007). Georgia is among 10 states with the highest HIV and AIDS rates and the number of people living below the poverty level has increased from 16.5% in 2009 to 17.9% in 2010. Therefore, health equity needs to be at the forefront of public health concerns. As HIV and AIDS continues to disproportionately affect the poor, male, and Black communities, it is important to provide access to free HIV tests. Many publicly-funded HIV test sites provide free or low-cost (sliding scale based on income) HIV tests to low-income, homeless, unemployed, and uninsured persons, who might otherwise be deterred from HIV testing due to the cost of an HIV test and lack of insurance and money (Solanki & Schauffler, 2000). Currently, there are no studies that have examined the effect of distance (miles) to publicly-funded free HIV test sites on HIV testing among Black men in DeKalb and Fulton Counties, Georgia.

The Andersen's Behavioral Model

The theoretical approach is guided by Andersen's initial Behavioral Model (Andersen, 1968). The behavioral model was initially developed in 1968 to help understand why families use health services, to define and measure equitable access to health care, and to help develop policies to promote equitable access (Andersen, 1968). The behavioral model states that an individual's use of health services is a function of the person's predisposition to use services, factors enabling or impeding use, and the need for care (Andersen, 1968; see Figure 2).

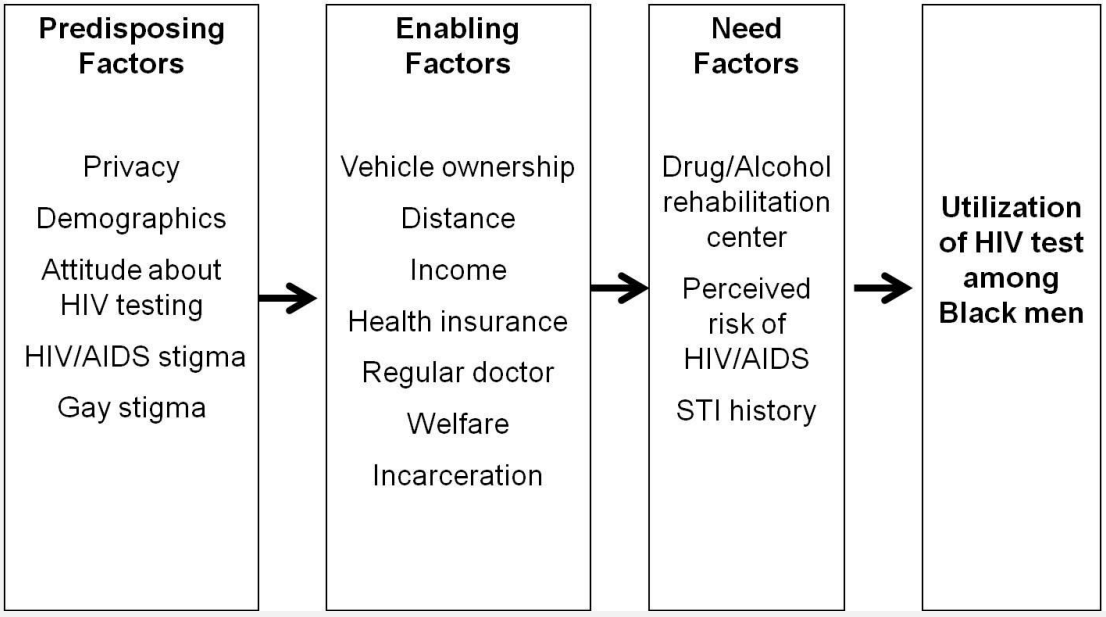

Figure 2. Conceptual framework of HIV testing based on the Andersen's behavioral model.
Source: Behavioral Model of Families' Use of Health Services (Vol. 25), by R. M. Andersen, 1968, Chicago, IL, University of Chicago, Center for health Administration Studies.

The present study has framed the behavioral model to include predisposing, enabling, and need factors found in previous studies to be associated with HIV testing. Predisposing factors include demographic characteristics, attitude about the HIV test, and HIV/AIDS-related stigma. Enabling or Impeding factors include income, health insurance, distance to free HIV test site, vehicle ownership, primary mode of transportation, having a regular doctor, welfare recipient

status, and incarceration history. Need factors include perceived risk of HIV/AIDS, sexually transmitted disease test history, and drug-rehabilitation history.

Predisposing Factors

Predisposing factors are individual and environmental level factors associated with the utilization of HIV testing. Predisposing factors such as gender, HIV related stigma, confidentiality concerns around HIV test results, and negative attitude concerning HIV testing have the ability to serve as barriers when obtaining an HIV test.

Demographics

Predisposing factors include demographic information such as race, gender, age, and health beliefs. Multisite data collected by states and local health departments in 16 U.S. cities indicate that late testing is more likely among the young adult African-American population (CDC, 2003). Bond et al. (2005) found that men aged 25 to 34 were 1.49 times more likely to have an HIV test than 18 to 24 years old; 35 to 44 years old were 1.71 times more likely than 18 to 24 years old; and those 45 years old and older were 1.43 times more likely than 18 to 24 years old to have an HIV test.

Attitudes about HIV Testing

Kalichman and Simbayi (2003) conducted a study to examine social and cognitive factors that may influence health decisions in relation to HIV testing in South Africa. This study found that participants who had not been tested for HIV held significantly more negative HIV testing attitudes than participants who had been tested, after controlling for age, sex, and education (Kalichman & Simbayi, 2003). This study also found that individuals who did not test for HIV were significantly less likely to view beneficial outcomes from testing, more likely to perceive

adverse testing outcomes, and more likely to endorse test avoidance (Kalichman & Simbayi, 2003).

HIV/AIDS Stigma

To begin the process of eradicating HIV/AIDS from the Black community and increasing the number of Black men seeking HIV testing and prevention, researchers should first address the silent reality that is unaddressed, which is the HIV/AIDS stigma. AIDS-related stigma refers to the "prejudice, discounting, discrediting, and discrimination directed at people perceived to have HIV or AIDS, as well as the individuals, groups and communities with which they are associated" (Herek & Capitanio, 1997). AIDS-related stigma finds expression in avoidance and ostracism of people with HIV, discrimination and violence against such individuals, and public support for punitive policies and laws that restrict civil liberties while hindering AIDS prevention efforts (Herek, 2002). HIV-related stigma has been found to be greater in rural areas. The south has the largest number of individuals with HIV living in rural areas (SAC, 2012). Being the target of stigma inflicts pain, isolation, and hardship on many people with HIV, whereas the desire to avoid it deters some from being tested for HIV, seeking treatment, and disclosing test results or practicing risk-reduction (Darrow, Montanea, & Gladwin, 2009; Fortenberry et al., 2002; Herek, 2002).

Since the 1980's, HIV-related stigma influenced attitudes and perceptions of those possibly infected with HIV. Herek (2002) found that 38% of the U.S. national sample of adults would be very concerned about stigma if they tested HIV positive; 44% of those who expressed this concern indicated that stigma influences their testing decisions. In earlier years the prominent belief was that infected with HIV were homosexual, sex workers, or injection drug users (Brooks, Etzel, Hinojos, Henry, & Perez, 2005; Herek & Capitanio, 1999).

Today, studies have shown that perceptions and attitudes have begun to change. According to The Henry J. Kaiser Family Foundation (2011), stigma around HIV testing is not a major concern for some people: 22% of Blacks were reported to be much more likely than Whites (5%) and Latinos (11%) to say people would think more of them if they received an HIV test. Although views in the 21st century seem to be more receptive to HIV testing, it is important to recognize that HIV-related stigma such as being labeled homosexual or promiscuous sexually, is still present. Therefore, the goal of increasing HIV testing among Black men is not only worthwhile, but also essential.

Confidentiality Concerns

Many HIV test facilities now offer confidential and/or anonymous HIV testing; however, confidentiality concerns still serve as a major barrier to seeking HIV testing. HIV test results are treated as medical information and HIV test results cannot be released without the person's permission. HIV test results fall under the Health Insurance Portability and Accountability Act of 1996 (HIPPA) which protects the privacy of an individual's medical records (Confidential and Anonymous Testing, 2010). It is important to take notice, that not all HIV testing sites are bound by HIPPA, which could be a deterrent for some individuals not to obtain an HIV test (Confidential and Anonymous Testing, 2010).

Studies have found that fear of results not remaining confidential serves as a barrier for individuals to get an HIV test (MacKellar et al., 2011; Myers, Orr, Locker, & Jackson, 1993; Payne et al., 2006). Payne et al. (2006) conducted a cross-sectional survey on barriers to HIV testing among African-American college students at a historically Black university in the Southern United States. In this study, 18% reported that fear of HIV test results not remaining confidential served as a barrier to seeking HIV testing (Payne et al., 2006). Spielberg, Kurth,

Gorbach and Goldbaum (2001) also conducted a study to identify factors that influence individuals HIV testing decision. These results showed that confidentiality was a major concern. Georgia began collecting AIDS reports in the early 1980s, and HIV reporting was mandated in 2003 (Georgia Department of Public Health, 2011). By law, Georgia laboratories are required to report all positive HIV-related laboratory test results (Georgia Department of Public Health, 2011). "Nearly half of MSM said they were concerned about named reporting for HIV testing and said they would only test if an anonymous option were maintained" (Spielberg et al., 2001). Anonymous and confidential testing in HIV test sites may serve to increase the rate of HIV testing among Black men. White MSM most frequently utilizes anonymous HIV tests over confidential tests in publicly-funded facilities (CDC, 1999). The low proportion of Black men who choose anonymous testing may reflect a lack of awareness that this service exists (CDC, 1999). Therefore, increasing the knowledge of anonymous HIV testing may increase HIV testing among Black males by decreasing their fear of confidentiality concerns.

Enabling and Impeding Factors

Enabling and impeding factors are structural level factors associated with the utilization of HIV testing. Enabling factors such as living below poverty (income), not having health insurance, not having easy access to affordable HIV test serves as barriers when obtaining an HIV test.

Enabling and impeding factors include income, insurance coverage, distance to HIV test sites (geography), and transportation. Research illustrates that individuals of low income are less likely to visit the doctor's office than individuals with higher income (Bond et al. 2005). Studies have found that individuals living in neighborhoods closer to healthcare clinics are more likely to visit the clinic than individuals who live farther from the healthcare clinic (Leibowitz & Taylor,

2007). Increased distance between residents and healthcare providers is commonly thought to decrease the utilization of healthcare (Allard, Tolman, & Rosen, 2003; Kanara et al., 2009).

Poverty and Income

The federal government defines the poverty level as income of $22,314 for a family of four and $11,139 for a single person (Schneider & Teegardin, 2011). Poverty is a major contributor to the HIV and AIDS epidemic among the United States Black population (Reif et al., 2012). Black Americans are disproportionately represented in low-income communities in the U.S. South. Atlanta's poverty level of 23.2% is higher than the national poverty level of 14.3% and higher than Georgia's poverty level (16.5%; U.S. Census Bureau, 2010a).

Poverty has been associated with poor health care, which can affect access to health care, HIV testing and medication. Bond et al. (2005) found that male welfare recipients were 1.87 times more likely to have received an HIV test than non-welfare recipients. Costs of co-pay, doctor visits, and HIV tests, may cause low-income and uninsured Blacks to not visit a hospital or doctor until they are seriously ill. A study was conducted to examine the association between poverty and being infected with HIV. Findings showed 1) poverty as a key factor to HIV infection among inner city heterosexuals and 2) individuals living in low-income urban areas, below the poverty level were twice as likely to be infected with HIV as those living above the poverty level (CDC, 2012g).

Health Insurance

Healthcare in the United States is principally funded through private insurance payments. Those who do not have health insurance may have to be insured by the government through state Medicare or Medicaid, or remain uninsured while paying out of pocket for all healthcare fees. In 2007, nearly a fifth of African-American individuals did not have health insurance, compared to

10% of White individuals (U.S. Census Bureau, 2008). Bond et al. (2005) found that men who had public or private health insurance were 1.92 times more likely to have a HIV test than men without health insurance.

Distance to HIV Test Site

Various studies have examined more specific healthcare issues such as distance to healthcare utilization. Gregory et al. (2000) found that use of cardiac revascularization services in New Jersey decreased as distance to the service increased (Gregory et al., 2000). Similarly, Harris, Aboueissa, and Hartley (2008) found that proximity to a hospital predicted higher hospitalization rates for cardiovascular disease in Maine (Harris et al., 2008). Reducing time and transportation costs by having HIV test sites in one's neighborhood may significantly influence an individual decision to seek HIV testing. One of the specific aims of this dissertation (Specific Aim 2) will address this topic and examine the association between transit distance and HIV testing among Black men.

Transportation: Vehicle Ownership

According to Chamber of Commerce Metro Atlanta (2007), Atlanta traffic is the fourth worst in the country. Three Georgia Tech Master students were frustrated with the lack of transportation alternatives in Atlanta; therefore, created the concept of an environmental friendly 22 miles beltline that would run 3 miles on either side of Atlanta's central business district. The beltline included a neighborhood-serving transit system such as streetcars, footpaths for walking, bicycling, and roller skating. The authors mailed their Master thesis to the Georgia City Council representatives. This idea was accepted and was included in the 25-year Mobility 2030 plan by the Atlanta Regional Commission, for improving transit in Atlanta, Georgia from 2005 to 2030.

Access to transportation is critically important for the utilization of healthcare services such as HIV testing. Studies have found that individuals who own a vehicle are more likely to travel the distance to a healthcare clinic than individuals who travel by public transportation. Millions of Americans are transportation disadvantaged because they cannot purchase their own vehicle. Members of that population, owing to low income, geographic isolation, or other reasons cannot transport themselves and are unable to pay for buses or taxis to HIV testing sites (Wallace et al., 2005). Pucher and Renne (2003) found that 26.5% of households with incomes lower than $20,000 do not own a vehicle. Race and ethnicity are also associated with being transportation disadvantaged. Pucher and Renne found that African-Americans have less mobility and use public transit at higher rates than the general population. In urban and rural areas, many public-transportation routes do not provide access to medical care, especially for the most economically disadvantaged neighborhoods. A study in Honduras found that walking time to the clinic negatively influenced primary healthcare utilization (Baker & Liu, 2006). Focusing on the population below age 65 in Ohio, Ahmed et al. (2001) found that 15% of respondents reported that finding transportation for medical care was "hard," whereas another 15% reported that it was "very hard." While long travel distances makes trips to HIV testing sites burdensome, lack of transportation makes those trips relatively impossible (Ahmed, Lemkau, Nealeigh, & Mann, 2001).

Primary Health Care

Individuals who are HIV-positive and utilize primary health care services are more likely to have access to life saving treatments, which can contribute to living longer and less usage of acute care services (Sohler, Xuan, & Cunningham, 2009). Improving linkage to healthcare services for HIV care and treatment is beneficial for the HIV-infected person. Those with

medical insurance were more likely to see an HIV care provider. Medical insurance proved to be an important variable for those deciding to seek medical attention (Anthony et al., 2007). Bond et al. (2005) found that men who had a regular physician were 2.18 times more likely to get an HIV test than men who did not have a regular doctor. Petroll et al. (2009) showed that African-American men who had one or more healthcare provider visits were significantly more likely to have been tested for HIV during the previous 12 months (56.6% vs. 40%). This study found that men with a primary physician were significantly more likely than other men to have been tested for HIV in the past 12 months (59.8% vs. 44.8%; Petroll et al., 2009). Among those men who had a primary physician, 49% reported that their physician had recommended getting an HIV test, and of these, 81% had been tested in the prior 12 months (Petroll et al., 2009).

Incarceration History

Confidential and Anonymous Testing (2010) reported that 2 million people are incarcerated in the United States, with a higher rate of incarceration among African-Americans. Southern States tend to place more people in prison than any other region (Reif et al., 2012). An estimated 1 in 7 persons living with HIV are in a correctional facility; however, the majority acquired the HIV infection in the community (Confidential and Anonymous Testing, 2010). CDC (2012) reported that the correctional setting tended to be the first place those incarcerated were tested and treated for HIV. Bond et al. (2005) found that men who had ever been incarcerated were 2.73 times more likely to get an HIV test than men who had never been incarcerated. Petroll et al. (2009) conducted a cross-sectional, community-based survey in urban neighborhoods in a Midwestern city among African-American men aged 18 to 45 years old. This study found that HIV testing occurred most commonly at doctor's offices (51%), in jail or prison (17%), and at STI clinics (13%; Petroll et al., 2009).

Need Factors

Perceived Risk of HIV/AIDS

How one perceives their risk for acquiring HIV/AIDS is an important need factor to better understand the utilization of HIV test sites. McCoy et al. (2009) found that most HIV-positive individuals did not perceive themselves to be susceptible to HIV infection. Most of these individuals believed their behavior did not place them at enough risk to warrant seeking HIV testing, either because of beliefs about risk behavior or denial of the risks of their behaviors (McCoy et al., 2009). Bond et al. (2005) found that for men, personally knowing someone who has HIV or AIDS was associated with having ever tested for HIV. Schoenborn, Marsh, and Hardy (1994) found that 23% of persons who acknowledged having HIV risk factors reported being tested in the preceding 12 months (Schoenborn et al., 1994).

Drug/Alcohol Treatment Center History

Bond et al. (2005) found that men who had entered a drug and alcohol treatment center were 3.4 times more likely to have an HIV test than men who had never entered a drug- and alcohol-treatment center.

Summary of Literature

The literature provided an examination of the strengths and limitations of the existing studies on the utilization of HIV tests. HIV is still a prevalent disease that is encircled with sexual prejudice and stigma. Black men comprise a significant portion of the most vulnerable. The literature provided several reasons for the disparity between Black Americans and other racial/ethnic races with HIV infection such as poverty, travel distance to HIV sites, stigma and lack of awareness of HIV status. Literature reiterated that HIV infection is highest in an urban low-income environment. This was also shown to be true in Fulton and DeKalb counties of

Georgia. Due to the gap in the literature related to distance and HIV testing among Black men, this study found a need to examine the relationship between distance to free HIV test sites and HIV testing among Black men living in Fulton and DeKalb counties, Georgia. This study also found an area of opportunity to identify barriers and facilitators for Black men when obtaining an HIV test. Various data collection methods such as questionnaires and in-depth, one-on-one interviews must be implemented to gather meaningful and accurate information concerning HIV testing utilization among Black men (E. Anderson, 2009). The literature shows that accessibility to testing sites can affect increased rates of testing and produce healthy behavior changes among this population. Literature has shown how HIV has increased profoundly as compared to other regions of the country where Blacks have resided. Therefore, gaining a better understanding of the barriers faced by Black men when obtaining an HIV test is imperative.

CHAPTER 3

METHODS

This dissertation comprises three phases. Phase I is an ecological study that used secondary data to evaluate geographic access to publicly-funded free HIV test sites from neighborhoods with high concentrations of Black men living below the poverty level. The unit of analysis was census tract. Phase I was guided by two research questions: (a) Where are the highly clustered neighborhoods of Black men living below the poverty level located in DeKalb and Fulton counties, Georgia? (b) Does transit distance (miles) to publicly-funded free HIV test sites differ by poverty level among neighborhoods with high proportions of Black men?

Phase II is a cross-sectional design that used primary data collection methods to examine the effect of transit distance (miles) to publicly-funded free HIV test sites on HIV testing in the past 12 months among Black men in DeKalb and Fulton Counties, Georgia. The Phase II unit of analysis was the individual and was guided by the research question: Are people living farther from the nearest publicly-funded free HIV test site less likely to have an HIV test in the past 12 months than people living closer to the nearest publicly-funded free HIV test site?

Phase III is a qualitative study that used in-depth interviews to identify factors that affect Black men's decisions to seek HIV testing. Phase III was guided by the research question: What individual and structural-level factors affect Black men's decision to seek HIV testing?

In Chapter 3, the research design reviewed are, study population, measurements, data collection procedures, data management, and data analysis. First, the methodologies for Phase I (Specific Aim 1) are reviewed, followed by Phase II (Specific Aim 2), and Phase III (Specific

Aim 3). The study design flow chart can be reviewed in Figure 3. The University of Georgia Institutional Review Board has approved this study.

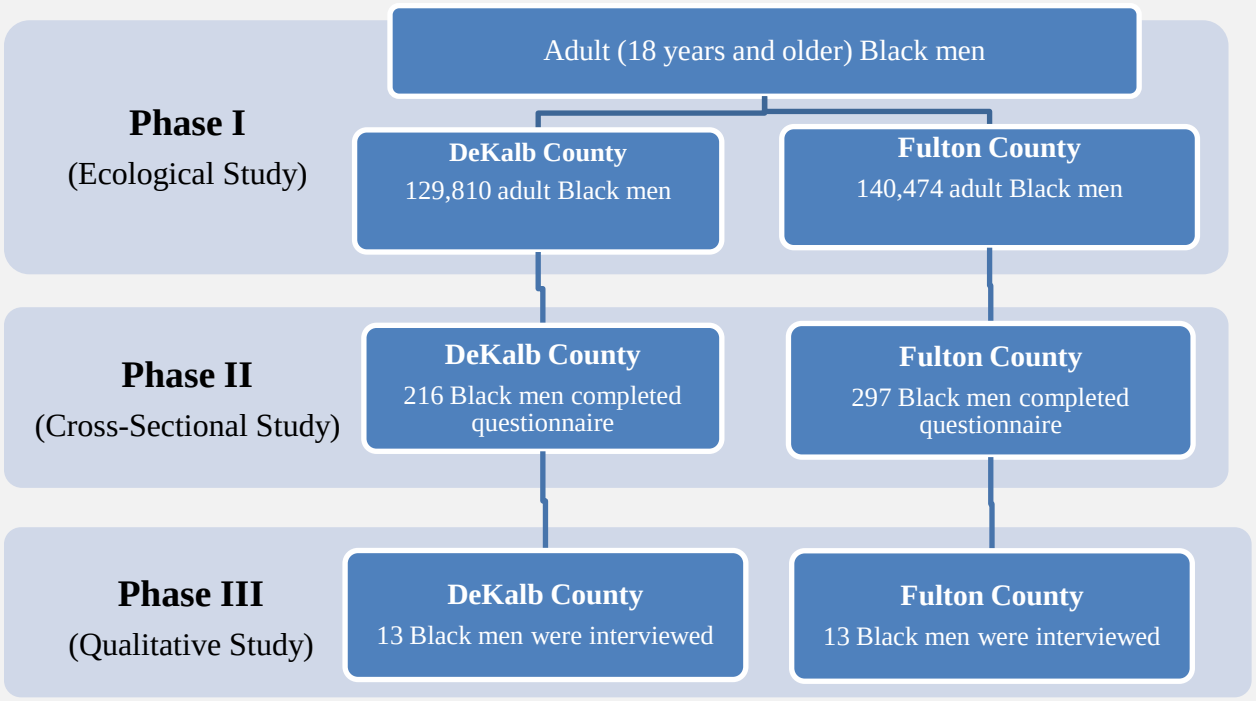

Figure 3. Study design flow chart

Phase I: Ecological Study

Specific Aim 1. Determine if transit distance to publicly-funded free HIV test sites differ between census tracts by poverty level among Black men in DeKalb and Fulton counties, Georgia.

Aim 1.1 Geographically locate census tracts with high proportions (> 50%) of Black men living below the poverty level.

Aim 1.2 Geographically locate publicly-funded free HIV test sites.

Aim 1.3 Geographically locate statistically significant clustered census tracts with high proportions (> 50%) of Black men living below (high poverty cluster) and above (low poverty cluster) the poverty level.

Hypothesis 1.3.1 Census tracts with high proportions of adult Black men living *below* the poverty level neighbor other census tracts with high proportions of adult Black men living *below* the poverty level (hot spot).

Aim 1.4 Assess the relationship between travel distance and poverty levels.

Aim 1.5 Compare transit distance (miles), to the nearest publicly-funded free HIV test sites with high proportions (> 50%) of Black men living *below* and *above* the poverty level.

Hypothesis 1.5.1 There is a difference in transit distance (miles) to the nearest publicly-funded free HIV test site between census tracts with high proportions of Black men living below the poverty level and census tracts with high proportions of Black men living above the poverty level.

Study Design Overview

Phase I is an ecological study that used secondary data collected in DeKalb and Fulton counties, Georgia to (a) geographically locate statistically significant clustered census tracts with high proportions (> 50%) of Black men living below and above the poverty level, and (b) compare the transit distance (miles) to publicly-funded free HIV test sites between census tracts with high proportions of Black men living below the poverty level and census tracts with high proportions of Black men living at and above the poverty level. Census tracts are small, relatively permanent geographic subdivisions of a county, sometimes called neighborhoods (Lo & Yeung, 2007). This study used Google Maps to determine the transit distance (miles) between the geographic center (centroid) of all census tracts and the nearest publicly-funded free HIV test site in DeKalb and Fulton counties.

This study combined methodologies from various disciplines such as epidemiology, biostatistics, geography, and health promotion to create an integrative approach to the problem of

HIV testing among Black men. It makes a substantial contribution to understanding geographical access to free HIV test sites in vulnerable neighborhoods and identifies poor neighborhoods to be targeted for free HIV test sites in DeKalb and Fulton Counties, Georgia.

Research Setting

This study includes publicly available information for DeKalb and Fulton Counties in the State of Georgia (see Figure 4). According to the Georgia Department of Public Health, the highest HIV prevalence in Georgia occurred among residents of the DeKalb Health District (510.2 cases per 100,000), followed by Fulton county (476.5 per 100,000; Georgia Department of Public Health, 2010).

The population in Fulton County is 50.6% White, 43.1% Black, 0.4% American Indian, 4.2% Asian, 0.1% Native Hawaiian, and 10.9% Hispanic or Latino (U.S. Census Bureau, 2010c). Per capita income in Fulton County is $30,003; the percent of persons living below the poverty level is 14.9% (U.S. Census Bureau, 2010c). The population in DeKalb County is 40.2% White, 53.7% Black, 0.4% American Indian, 4.4% Asian, 0.1% Native Hawaiian, and 8.7% Hispanic or Latino (U.S. Census Bureau, 2010b). Per capita income in DeKalb County is $23,968; the percent of persons living below the poverty level is 15.6% (U.S. Census Bureau, 2010b).

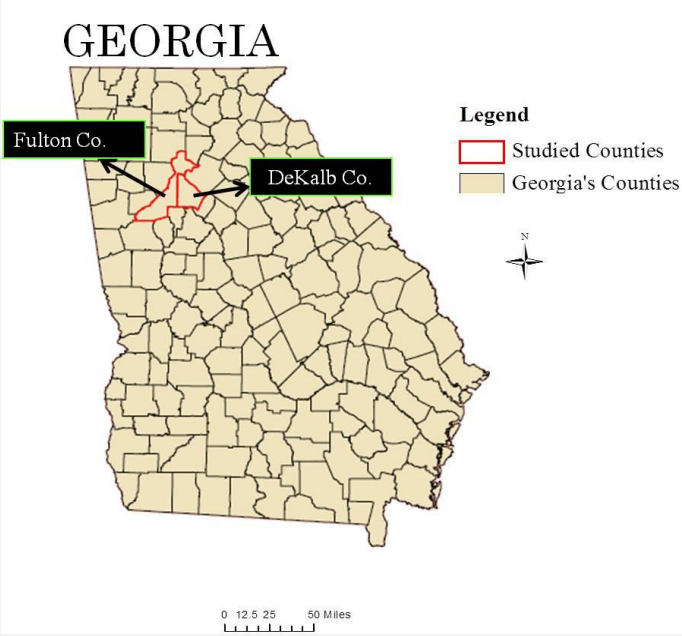

Figure 4. Map of studied counties in Georgia.

Study Population

The target population for this study are adult (18 years and older) Black men who reside in DeKalb and Fulton Counties. Actively functioning publicly funded HIV test sites that offer free HIV test in DeKalb and Fulton Counties were included in this study. For this study, a publicly funded free HIV test site is defined as a state or federally funded clinic or center that provides HIV tests to the general population of Black men at no cost to the individual or his health insurance company. "Free" HIV tests are defined as HIV tests that carry no charge to the individual or the individual's health insurance company. A list of HIV test sites in Georgia was collected from the Georgia Department of Public Health, and Hixson et al. 2011. Test sites that were excluded from this study included sites that did not provide free HIV tests, adolescent test sites, women-only sites that only offered HIV test to only women, bar/club location test sites, correctional facilities, colleges/universities, and alcohol- and drug-rehabilitation centers. HIV test sites located in DeKalb and Fulton counties were called by phone to verify (a) active status, (b) availability of free HIV tests at the clinic, and (c) publicly funded status. After the exclusion

criteria were implemented, 7 HIV test sites were identified in Fulton County, and 2 HIV test sites in DeKalb County. Figure 5 is a diagram that depicts the test-site exclusion process.

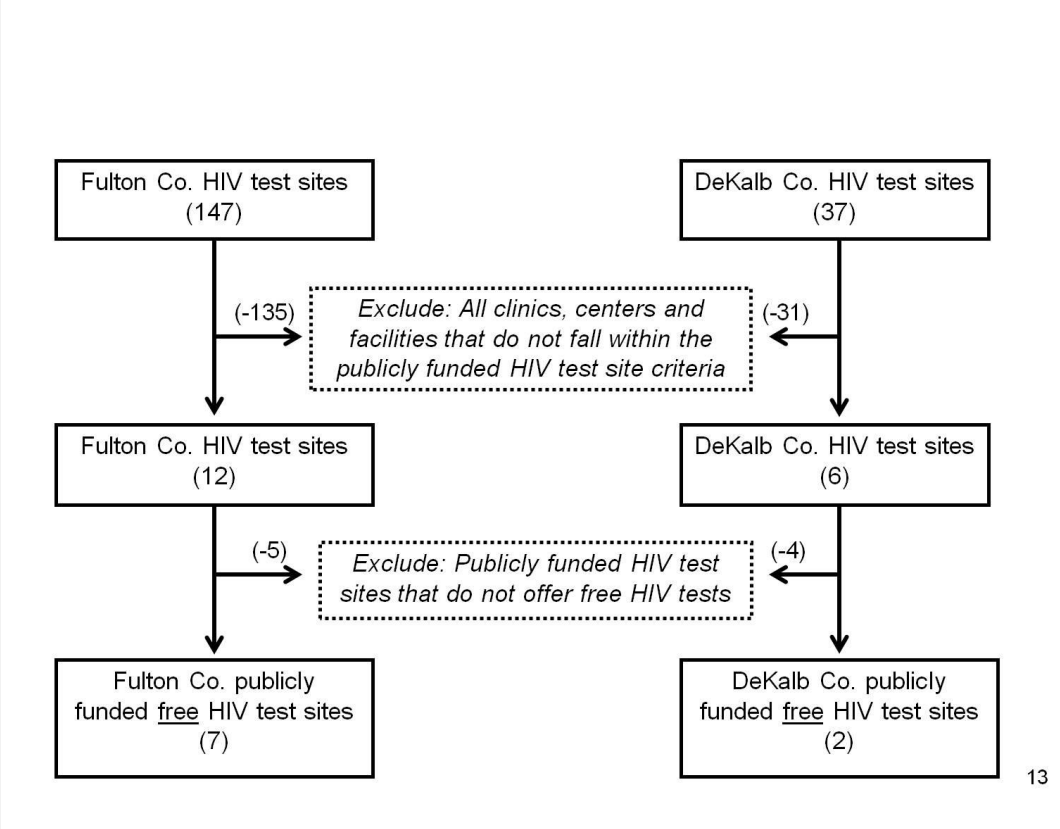

Figure 5. Flow chart to identify publicly-funded free HIV test sites in DeKalb and Fulton counties.

Table 2. Study definitions.

Term	Definition
Adult	18 years and older
Black	Self-identify as Black
Living below the poverty level	Person with an annual salary of less than (US) $11,344 (US Census Bureau, 2012)
High proportion	Greater than or equal to 50%.
Free HIV test	HIV test that is of no cost to the individual receiving it and no cost to their health insurance company.
Publicly funded free HIV test site	State or federally funded clinics/centers that provide free HIV tests to the general population at no cost (free)

Measurements: Specific Aim 1

Outcome variable: Transit distance in miles from geographic centroid of a census tract to the nearest publicly funded free HIV test site.

Exposure variable: Proportion of Black men living below and above the poverty level in the past 12 months (2005–2009) by census tract.

The unit of measurement for Specific Aim 1 is "census tract" in DeKalb and Fulton Counties, Georgia. Table 3 shows the number of census tracts, and the number of adult Black men living below and above the poverty level in DeKalb and Fulton Counties, Georgia.

Table 3. Characteristics of DeKalb and Fulton Counties, Georgia, 2005-2009.

Variable	County	
	DeKalb Co.	Fulton Co.
Number of census tracts	115	167
Total number of adult Black men living below poverty level	15,866	24,617
Total number of adult Black men living at and above poverty level	110,944	109,283

Source: *American Community Survey*, by U.S. Census Bureau, 2012, retrieved from http://www.census.gov/acs/www/

Outcome Variable: Transit distance (miles) between geographic centroid of a census tract and nearest publicly funded free HIV test site

Transit distance is a continuous measure of the shortest distance (miles) based on road-network navigation. It is calculated from the center of the census tract (geographic centroid) to publicly-funded free HIV test sites in DeKalb and Fulton counties.

The shortest path between two points in length was used to determine the transit distance in miles. This shortest path is called a geodesic. Transit distance was determined between the latitude and longitude coordinates of the centroid for each census tract (n = 421) and latitude and longitude coordinates of all publicly-funded test sites that offer free HIV tests (n = 9) in DeKalb

and Fulton counties. The transit distance was based on road network navigation. To find the shortest transit distance between multiple origins (census tracts) and multiple destinations (study HIV test sites) at once, a programmer was hired to develop a Google Maps distance matrix application for this study. This application calculated the shortest transit distance between all origins and destinations. The Google Maps distance matrix application was located on a secure web server (www.howfaraway.us). The application was for internal use only and was secured with a username and password. The investigators had the username and password to access the application. To use the Google Maps distance matrix application, the user inputs the latitude and longitude coordinates of the centroid for each census tract in the first and second row. The user then inputs the latitude and longitude coordinates or address of each study HIV test site in the third row. Lastly, the user clicks both calculate buttons and the application will develop a driving distance in miles between each origin and destination point. The matrix is transferred to Microsoft Excel by the copy and paste function to create a spreadsheet.

Google Maps uses multiple shortest path algorithms such as A*, and Floyd-Warshall to identify the shortest driving distance from multiple sources to multiple destinations. The Floyd-Warshall algorithm is a graph analysis algorithm for finding shortest paths (Weisstein, 1962). It compares all possible paths through the graph between each pair of vertices. The algorithm works by first computing shortest Path (i, j, k) for all (i, j) pairs for $k = 1$, then $k = 2$ (Weisstein, 1962). This process continues until $k = n$, and we have found the shortest path for all (i, j) pairs using any intermediate vertices (Weisstein, 1962). A* is a computer algorithm that is widely used in path finding and graph traversal, the process of plotting an efficiently traversable path between points, called nodes (Hart, Nilsson, & Raphael, 1972). A* achieves better performance (with respect to time) by using heuristics (Hart et al., 1972). A* uses a best-first search and finds

a least-cost path from a given initial node to one goal node (out of one or more possible goals; Hart et al., 1972).

ArcGIS is another popular resource used to calculate the distance between multiple origins and destinations. Google Maps has several advantages in comparison to ArcGIS, which justifies the rationale for using Google Maps for this study. The Google Maps application approach does not need the preparation of a network dataset like ArcGIS (Wang & Xu, 2011). The development of a network dataset is time consuming and one has to collect the transportation network to build the road network data structure. The Google Maps application approach taps into the network data residing in a Google server. The second advantage is that the Google Maps application approach uses more updated road data than ArcGIS (Wang & Xu, 2011). The road network dataset in ArcGIS 10 is based on the data in 2005. Google updates the data twice a month, typically around the 6th and 20th (Taylor, 2010).

Exposure Variable: Proportion of Black men living below and above the poverty level in the past 12 months (2005-2009) by census tract

In the United States, the ACS measures poverty by annual salary income. In 2010, the United States poverty threshold (level) for one person under the age of 65 was an annual salary of less than $11,344 (U.S. Census Bureau, 2012). Census money income is defined as income received on a regular basis (exclusive of certain money receipts such as capital gains) before payments for personal income taxes, social security, union dues, and Medicare deductions (U.S. Census Bureau, 2012). Therefore, money income does not reflect the fact that some families receive part of their income in the form of noncash benefits, such as food stamps, health benefits, subsidized housing, and goods produced and consumed on a farm (U.S. Census Bureau, 2012).

The proportion of adult (18 years and older) Black men living below and above the poverty level in DeKalb and Fulton counties will be calculated using Equation 1.

Equation 1. Proportion of Black men living below and above the poverty level.

Variable	Equation
Proportion of adult Black men living *below* poverty level	Number of adult Black men below poverty level / Total number of adult Black men
Proportion of adult Black men living at and *above* poverty level	Number of adult Black men at and above poverty level / Total number of adult Black men

After the proportions were calculated in Microsoft Excel, they were then imported into ArcMap 10 to create maps that show the distribution of poverty among Black men in DeKalb and Fulton Counties and the distribution of adult Black men. This map was used to identify the census tracts with high proportions of Black men living below and above poverty. In ArcMap 10, the proportions are separated into classes based on quantiles. The census tracts with proportions ≥ 50% are defined as the census tracts with high proportions of Black men living below and above the poverty level.

Data Collection Procedures

Poverty status and total population of Black men. The poverty status of adult (18 years and older) Black men in the past 12 months and total population of adult Black men (2005–2009) was retrieved from the ACS.

Data Source: The American Community Survey. The ACS is a nationwide survey designed to provide communities with reliable and timely demographic, social, economic, and housing data for the nation, states, congressional districts, counties, places, and other localities every year (U.S. Census Bureau, 2012). It has an annual sample size of about 3 million addresses across the United States and Puerto Rico and includes both housing units and group quarters

(e.g., nursing facilities and prisons; U.S. Census Bureau, 2012). The ACS is conducted in every county throughout the nation. Beginning in 2006, ACS data for 2005 was released for geographic areas with populations of 65,000 and greater. The ACS is a mandatory survey that uses an up-to-date sampling frame (Census Bureau's Master Address File updated by using the U.S. Postal Service's Delivery Sequence File and targeted address canvassing; U.S. Census Bureau, 2012). The ACS uses a self-response mail-out/mail-back questionnaire, followed by Computer Assisted Telephone Interview or Computer Assisted Personal Interview (U.S. Census Bureau, 2012). Until 2006, the ACS excluded group quarters from its sampling frame, slightly affecting the estimates of income and poverty, as some people in the poverty universe are in non-institutional group quarters, such as those in group homes and shelters (U.S. Census Bureau, 2012). The ACS began including both institutional and non-institutional group quarters in its sampling frame starting in January 2006 (U.S. Census Bureau, 2012).

The ACS provides 1, 3, and 5-year estimates. The present study used 5-year estimates. The 1-year and 3-year estimates are more current than the 5-year estimates (U.S. Census Bureau, 2012). However, the 5-year estimates have a larger sample size and are therefore usually more precise than the 1-year or 3-year estimates (U.S. Census Bureau, 2012). The increased precision of a 5-year estimate may be particularly important when studying a small area or a small population subgroup (U.S. Census Bureau, 2012).

HIV test site dataset. The Georgia Department of Community Health (2008) and Hixson, Omer, Del Rio, and Frew (2011) provided this study with addresses of HIV test sites in the selected counties. Phone calls to all facilities were conducted to verify active status and availability of free HIV tests. An additional literature review and online search were conducted to identify additional HIV test sites in DeKalb and Fulton Counties.

Geographic information system dataset. A shapefile is a geospatial vector data format for geographic information systems software (Environmental System Research Institute [ESRI], 1998). Shapefiles spatially describe geometries: points, polylines, and polygons (ESRI, 1998). Shapefiles used for this study are polygons that represent the census tracts in the State of Georgia shapefile. All shapefiles are collected from the Georgia GIS Data Clearinghouse (2009).

Data Source: The Georgia GIS Clearinghouse. The clearinghouse specializes in spatial data and provides data that can be used to build GIS to study a wide variety of geographic and spatially-related problems. The clearinghouse offers over 10,000 different GIS data sets for the State of Georgia (Georgia GIS Data Clearinghouse, 2009). Data are currently available free of charge through direct download from the Clearinghouse website (www.data.georgiaspatial.org/). Below is a table that shows where data for this specific aim were collected (see Table 4).

GPS Measurements (latitude and longitude coordinates). This study obtained the addresses of all publicly-funded free HIV test sites in DeKalb and Fulton Counties. These addresses were geocoded into GIS to obtain the latitude and longitude (x, y) coordinates. "Geocoding is the process of assigning geographic coordinates (e.g., latitude-longitude) to street addresses, as well as other points and features. With geographic coordinates, the features can then be mapped and entered into Geographic Information Systems" (Lo & Yeung, 2007, p. 208).

Table 4. Data sources for Specific Aim 1

Data	Source
State of Georgia shapefile	Georgia GIS Clearinghouse
Georgia Counties shapefiles	Georgia GIS Clearinghouse
DeKalb County census tracts shapefiles	Georgia GIS Clearinghouse
Fulton County census tracts shapefiles	Georgia GIS Clearinghouse
Total population of adult Black men in DeKalb and Fulton counties by census tracts	American Community Survey (2005–2009)
Poverty status among adult Black men in DeKalb and Fulton counties by census tracts	American Community Survey (2005–2009)

Source: *Georgia GIS Clearinghouse*, by Georgia GIS Data Clearinghouse, 2009, retrieved from https://data.georgiaspatial.org/login.asp; *American Community Survey*, by U.S. Census Bureau, 2012, retrieved from http://www.census.gov/acs/www/

Census tract shapefiles for DeKalb and Fulton Counties were uploaded into ArcMap 10 to create a map. ArcMap 10 was used to identify the centroid of each census tract. The centroid is the geometric center of a polygon (census tract). Latitude and longitude coordinates for each centroid were identified.

Data Entry and Data Management

All proportions and coordinates for the centroid of each census tract and HIV test site was manually entered into a spreadsheet using Microsoft Excel. Initial checks for out-of-range values were flagged and edited. Once the data were cleaned, these were exported to a permanent STATA 12 databases for archiving and analysis. Security for the electronic data files was crucial and files were maintained on a locked computer and backed up regularly on an external hard-drive.

Data Analysis

Geospatial Cluster Analysis

Individuals living below the poverty level tend to be clustered in certain neighborhoods rather than being evenly distributed across geographic areas. Leibowitz (2007) study found that

poverty is correlated with HIV infection. Therefore, it is important to place HIV test sites within these neighborhoods, to increase HIV testing. Cluster maps will provide the means to identify an optimal distribution of HIV testing clinics/centers in poor neighborhoods. To identify highly concentrated neighborhoods with Black men living below the poverty level, geospatial cluster analysis was conducted.

Aim 1.1 Geographically locate census tracts with high proportions (> 50%) of Black men living below the poverty level.

Aim 1.2 Geographically locate publicly-funded free HIV test sites.

Aim 1.3 Geographically locate statistically significant clustered census tracts with high proportions (> 50%) of Black men living below (high poverty cluster) and above (low poverty cluster) the poverty level.

Hypothesis 1.3.1 Census tracts with high proportions of adult Black men living *below* the poverty level neighbor other census tracts with high proportions of adult Black men living *below* the poverty level (high poverty cluster).

H_o: No spatial autocorrelation $Z(G) = 0$

H_a: Spatial autocorrelation $Z(G) > 0$ = high poverty cluster; $Z(G) < 0$ = low poverty cluster

ArcMap 10 was used to examine the spatial clustering of Black men living below the poverty level in DeKalb and Fulton Counties. Clusters are defined as the geographic areas in which the prevalence of disease is disproportionately high compared to neighboring areas (ESRI, 1998). Local indicators of spatial autocorrelation are used to evaluate the existence of clusters in the spatial arrangement of a given variable by individual units such as census tracts (Wong & Lee, 2005). Spatial autocorrelation tools test whether the observed value of a variable at one

locality is independent of values of the variable at neighboring localities (Wong & Lee, 2005). There are neighborhood rules in spatial statistics that define which adjacent census tract to compare to the central census tract (Wong & Lee, 2005). This study is based on the "queen's case rule." The queen's case rule is based on the selection of all eight neighboring census tracts that share a boundary or point with the central census tracts (Wong & Lee, 2005). Figure 6 is an example of the queen's case neighboring rule.

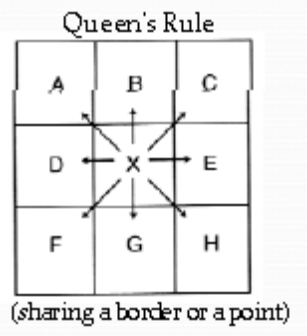

Figure 6. Queen's case rule.
Source: *Statistical Analysis of Geographic Information*, by D. Wong & J. Lee, 2005, Hoboken, NJ, John Wiley & Sons, p. 335.

Local spatial autocorrelation is evaluated by calculating the Moran's I index. The Moran's I index values range from −1 (indicating perfect dispersion) to +1 (perfect correlation). A zero value indicates a random spatial pattern. For statistical hypothesis testing, Moran's I values can be transformed to Z-scores in which values greater than 1.96 or smaller than −1.96 indicate spatial autocorrelation that is significant at the 5% level. To create a map that allows one to visually identify the spatially correlated clustered census tracts with high proportions of Black men living below poverty, the hot spot analysis tool was used to calculates the local Getis-Ord Gi* statistic (G-statistic) for each census tract in the dataset. The local G-statistic is derived for each areal unit (census tract) to indicate how the value (poverty status) of the census tract is associated with the value (poverty status) of the surrounding census tracts (see Equation 2) (Wong & Lee, 2005).

Equation 2. Local *G*-Statistic

$$G_i(d) = \frac{\sum_j w_{ij}(d)x_j}{\sum_j x_j} \qquad \text{For } i \neq j$$

Source: *Statistical Analysis of Geographic Information*, by D. Wong & J. Lee, 2005, Hoboken, NJ, John Wiley & Sons.

x_j is the attribute value (proportion of adult Black men living below or above poverty level)

j is the feature (census tract)

d is the distance used to include the neighboring census tracts

w_{ij} is the spatial weight between feature i and j

- W_{ij} weights matrix has only 1 or 0
- 1 if j is within d distance of i
- 0 if it is beyond that distance

The G-statistic returned for each census tract in the dataset is a *z*-score. To obtain the standardized score, the expected value and variance of the statistic must be known (see Equation 3). The *z*-score, *p*-value, and the expected and observed values are calculated by ArcMap 10 (see Equation 4).

Equation 3. Expected Value

$$E[G_i] = W_i / n - 1$$

Source: *Statistical Analysis of Geographic Information*, by D. Wong & J. Lee, 2005, Hoboken, NJ, John Wiley & Sons.

Equation 4. *Z*-Score

$$Z[G_i] = \frac{G_i(d) - E[G_i]}{\sqrt{Var[G_i]}}$$

Source: *Statistical Analysis of Geographic Information,* by D. Wong & J. Lee, 2005, Hoboken, NJ, John Wiley & Sons.

Resultant *z*-scores and *p*-values indicate where census tracts with either high or low proportions of adult Black men living below the poverty level cluster spatially. For statistically significant positive *z*-scores, census tracts with high proportions of Black men living below the poverty level neighbor census tracts with high proportions of adult Black men living below the poverty level (high–high: high poverty cluster). For statistically significant negative *z*-scores, census tracts with low proportions of Black men living below the poverty level neighbor census tracts with low proportions of adult Black men living below the poverty level (low–low: low poverty cluster). Table 5 provides an interpretation of the *z*-score.

Table 5. Interpretation of Local G-Statistic.

$Z\ [G_i]$	Interpretation
$Z\ [G_i] > 0$	High poverty cluster (High values next to High values)
$Z\ [G_i] < 0$	Low poverty cluster (Low values next to Low values)

Source: *Statistical Analysis of Geographic Information,* by D. Wong & J. Lee, 2005, Hoboken, NJ, John Wiley & Sons.

To test the null hypothesis, the proportions of adult Black men living below the poverty level by census tracts in DeKalb and Fulton Counties will be imported into ArcMap 10 from Microsoft Excel. The proportions of poverty status by census tracts were joined with the DeKalb and Fulton Counties census tract shapefiles in ArcMap 10. Shapefiles are files that appear as polygons in ArcMap 10. Polygons in the shapefile represent census tracts in DeKalb and Fulton counties. To correctly join the proportions of poverty level by census tract to the correct DeKalb and Fulton Counties census tract, data were joined based on the census tract Federal Information

Process Standard (FIPS) code. Every census tract is represented by a FIPS code. FIPS codes are a standardized set of numeric or alphabetic codes issued by the National Institute of Standards and Technology to ensure uniform identification of geographic entities through all federal government agencies (Lo & Yeung, 2007). After joining the poverty level data with the DeKalb and Fulton Counties shapefiles, ArcMap provided a map to show the distribution of proportions of adult Black men living below and above the poverty level. Proportions are divided into natural quartiles.

A spatial technique such as spatial cluster analysis was performed in ArcMap 10 to identify spatial concentrations (clusters) of Black men living below the poverty level. To test the null hypothesis, the local *G*-statistic test identified the *z*-score and *p*-value for each census tract. Resulting *z*-scores and *p*-values identified the statistically significant hot and cold spots of adult Black men living below the poverty level in DeKalb and Fulton Counties. Arc Map 10 created a map of significance levels for the cluster map. Maps were created to show the statistically significant clustered census tracts with high proportions of Black men living below the poverty level.

Specific Aim 1.4 and 1.5

Aim 1.4 Assess the relationship between travel distance and poverty levels.

Aim 1.5 Compare transit distance (miles) to the nearest publicly-funded free HIV test sites with high proportions (> 50%) of Black men living *below* and *above* the poverty level.

H_o: There is no difference in transit distance (Below poverty = Above poverty).

H_a: There is a difference in transit distance (miles) to publicly-funded free HIV test site between census tracts with high proportions of Black men living below the poverty

level and census tracts with high proportions of Black men living at and above the poverty level (Below poverty $\neq$ Above poverty).

The null hypothesis for Specific Aim 1.5 is tested using a two-tailed test. A significance level of $\alpha = 0.05$ is used with a power criterion of 0.80. The Wilcoxon rank-sum test (Mann-Whitney U 2 Sample test) is used to test the null hypothesis. The Wilcoxon rank-sum test is used to compare the means of the two independent groups where data are non-normally distributed. The Wilcoxon rank-sum test analyzes the equality of the sample medians rather than the means. The theory of the test is that if the two samples are similar, their medians will also be similar and the mean ranks will be equal. If one mean rank is larger, then that sample must have greater observations (and therefore a larger median) than the other. The Wilcoxon rank-sum test then determines how different the two mean ranks are by using the statistic. The null hypothesis will be rejected if the *p*-value is < 0.05. If the *p*-value < 0.05 (reject the null hypothesis), there is statistically significant evidence that shows there is a difference in transit distance (miles) between census tracts with high proportions of Black men living below the poverty level and the transit distance between census tracts with high proportions of Black men living at and above the poverty level. If the *p*-value > 0.05 (fail to reject the null hypothesis), there is statistically significant evidence that shows there is no difference in the transit distance between census tracts with high proportions of Black men living below poverty the level and census tracts with high proportions of Black men living at and above the poverty level. This analysis was implemented using STATA 12.

Phase II: Cross-Sectional Study

Specific Aim 2. Determine whether the transit distance (miles) between a participant's home address and nearest publicly-funded free HIV test site is associated with HIV testing in the past 12 months.

Study Design Overview

From July 2012 to September 2012, this cross-sectional design used primary data collection methods to implement a community-based survey to determine whether the transit distance in miles between a participant's home address and publicly funded free HIV test site is associated with HIV testing in the past 12 months. Participants completed a confidential, self-administered, written questionnaire (see Appendix G). The questionnaire was collected immediately upon completion. Active street recruitment was implemented by passing out business cards and posting flyers in several locations. The recruitment material provided a description of the study and relevant contact information. Interested participants could call the investigator, and if eligible, the confidential questionnaire was administered over the phone. The target goal of completed surveys was 426 questionnaires (DeKalb = 204; Fulton = 222).

Research Setting

Participants were recruited in neighborhoods with high proportions of adult Black men living below the poverty level in DeKalb and Fulton Counties.

Inclusion and Exclusion Criteria

Self-identified adult (18 years and older) Black men currently residing in DeKalb or Fulton Counties were eligible for screening. All of the following characteristics were excluded from this study: (a) Non-English speaking (b) currently residing in DeKalb or Fulton Counties for less than a week, and (c) participated in the in-depth interview for specific aim 3.

Instrument

An instrument was developed to determine whether the transit distance (miles) between a participant's home address and publicly-funded free HIV test site is associated with HIV testing in the past 12 months among adult Black men in DeKalb and Fulton Counties (see Appendix G). Development of the instrument was guided by Andersen's (1968) initial behavioral model and consisted of 38 questions. The questionnaire measured predisposing factors (demographics, attitude about HIV testing, Gay stigma, HIV/AIDS stigma); enabling and impeding factors (income, health insurance, distance between participant's residence and publicly-funded free HIV test site, vehicle ownership, primary doctor, welfare recipient, and incarceration history); and need factors (perceived risk of HIV/AIDS, STI history, drug-rehabilitation history).

To examine perceived risk of HIV/AIDS, attitudes about HIV testing, and HIV/AIDS stigma, measurement items were adapted from MacKellar et al. (2005), and Kalichman et al. (2005). Perceived risk of HIV/AIDS and attitudes about HIV testing measures have been used in past research among Black men and have shown construct validity (Kalichman & Simbayi, 2003; MacKellar et al., 2005). The HIV/AIDS-related stigma scale has been used consistently among Black men and has a Cronbach's α of 0.75 (Kalichman et al., 2005).

To ensure that the questions were understood and unambiguous, the survey was pretested on a small group of people comparable to the target population. These individuals were asked to rephrase the question in their own words, while trying to keep the meaning as close to the original as possible. The original question could be, "Could you repeat the original questions in your own words?" Another question may be, "How would you say that question yourself?" This technique was mainly used to identify comprehension problems. Responses were written verbatim and were coded into one of four categories: fully correct; generally correct (no more

than one part altered or omitted); partially wrong (but the person understood the intent); and completely wrong (Foddy, 1998).

Measurements

Outcome: HIV test in the past 12 months. A dichotomous measure for HIV test history in the past 12 months was obtained from all participants. On the questionnaire, the participants were asked "Have you been tested for HIV in the past 12 months?" (Yes/No).

Main exposure: Transit distance (miles). A continuous measure of transit distance (miles) between the participant's current home address and the nearest publicly funded site that offers free HIV test was calculated using Google Maps. Participants were asked for their home address: building number, street/road/drive etc., apartment number, city, state, and zip code.

Covariates

Age. A continuous measure of age was obtained from all participants.

Educational attainment. A categorical measure of educational attainment was obtained from all participants. On the questionnaire, the participants were asked "What is the highest grade you completed?" (< 12th, Some College or Associate in Arts (AA), Bachelor or higher).

Employment. A dichotomous measure of employment status was obtained from all participants. On the questionnaire, the participants were asked "Are you currently employed or working?" (Yes/No).

Monthly salary income. A categorical measure of monthly income was obtained from all participants. The unit of currency was U.S. dollars. On the questionnaire, the participant was asked "About, how much money do you earn in a month?" (No income, $1–$300, $301–$500, $501–$700, $701–$1,000, $1,001–$1,500, $1,501–$2,000, and greater than $2,000). This

variable was recoded to collapse categories (No Income, $1–$500, $501–$1,001, $1,001–$1,500, Greater than $1,500).

Welfare. A dichotomous measure of welfare status was obtained from all participants. On the questionnaire, the participants were asked, "Are you a welfare recipient?" (Yes/No).

Homeless. A dichotomous measure of homeless status was obtained from all participants. On the questionnaire, the participants were asked "In the past 12 months, have you been homeless?" (Yes/No).

Primary mode of transportation. A categorical measure of primary mode of transportation was obtained from all participants. On the questionnaire, the participants were asked, "How do you get around most of the time?" (Car, Bus, Walk, Bike, Taxi, I always ask my friends or family for a ride).

Vehicle ownership. A dichotomous measure of vehicle ownership was obtained from all participants. On the questionnaire, participants were asked, "Do you currently have a vehicle?" (Yes/No).

Regular doctor status. A dichotomous measure of having a regular doctor was obtained from all participants. On the questionnaire, participants were asked, "Do you have a regular doctor?" (Yes/No).

Location of doctor visit. A categorical measure for location of doctor visit was obtained from all participants. On the questionnaire, participants were asked, "Where do you go for your doctor visits?" (private doctor office, emergency room, jail or prison, urgent care clinic, STD clinic, other).

Health-insurance coverage. A dichotomous measure of health-insurance coverage was obtained from all participants. On the questionnaire, the participants were asked, "Do you have healthcare insurance?" (Yes/No).

Type of health insurance. A categorical measure for type of health insurance was obtained from all participants. On the questionnaire, the participants were asked, "What type of health insurance do you have?" (Private, Medicaid, Medicare, Public Assistance, No insurance). The variable was recoded as: No health insurance, private health insurance, and other (Medicaid, Medicare, Public Assistance, etc.).

HIV test history ever. A dichotomous measure for HIV test history was obtained from all participants. On the questionnaire, the participants were are asked, "Have you ever been tested for HIV?" (Yes/No).

HIV test location. A categorical measure for HIV test location was obtained from all participants. On the questionnaire, the participants were asked, "Where did you get your last HIV test?" (emergency room, hospital inpatient, hospital outpatient, urgent-care clinic, doctor's office, STD/AIDS clinic, school or college clinic, homeless shelter, drug- or alcohol-rehabilitation center, jail or prison, other, never taken HIV test).

Location of HIV test in the past 12 months. A categorical measure for location of HIV test in the past 12 months was obtained from all participants. On the questionnaire, the participants were asked "For the HIV test you received in the past 12 months, where did you get tested? (emergency room, hospital inpatient, hospital outpatient, urgent-care clinic, doctor's office, STD/AIDS clinic, school or college clinic, homeless shelter, drug- or alcohol-rehabilitation center, jail or prison, other, did not get tested in the past 12 months).

STI test history. A dichotomous measure for STI test history was obtained from all participants. On the questionnaire, the participants were asked, "Have you ever had a sexually transmitted disease test?" (Yes/No).

STI test location. A categorical measure for STI test location was obtained from all participants. On the questionnaire, the participants were asked, "Where did you get tested for a STD?" (emergency room, hospital inpatient, hospital outpatient, urgent-care clinic, doctor's office, STD/AIDS clinic, school or college clinic, homeless shelter, drug- or alcohol-rehabilitation center, jail or prison, other, did not get tested in the past 12 months).

Incarcerated in prison. A dichotomous measure of incarceration history was obtained from all participants. On the questionnaire, the participants were asked, "Have you ever been incarcerated in prison?" (Yes/No).

Incarcerated in jail. A dichotomous measure of incarceration history in jail was obtained from all participants. On the questionnaire, the participants were asked, "Have you ever been incarcerated in jail?" (Yes/No).

Drug/alcohol treatment center. A dichotomous measure of drug- or alcohol-treatment center was be obtained from all participants. On the questionnaire, the participants were asked, "Have you ever been in a drug- or alcohol-treatment center?" (Yes/No).

Perceived risk of HIV. Perceived risk for being infected with HIV was measured with the following question: "Which of the following describes how likely it is that you are infected with HIV today?" Participants who answer "No chance of it," "very unlikely," or "unlikely" are defined as having low perceived risk. Participants who answer "likely" or "very likely" are defined as having moderate to high perceived risk. This measure is adapted from (MacKellar et al., 2005, see Table 6).

Table 6. Perceived risk of HIV measure.

Statement	No chance of it	Very unlikely	Unlikely	Likely	Very likely
Which of the following describes how likely it is that you are infected with HIV today?	0	1	2	3	4
	Low perceived risk (0)			Moderate to high perceived risk (1)	

Source: "Unrecognized HIV infections, risk behaviors, and perceptions of risk among young men who have sex with men: Opportunities for advancing HIV prevention in the third decade of HIV/AIDS," by D. MacKellar, L. Valleroy, G. Secura, S. Behel, T. Bingham, D. Celentano., R. S. Janssen, 2005, *Journal of Acquired immune Deficiency Syndromes, 38*, 604.

Attitudes toward HIV testing. Attitudes toward HIV testing were measured on a 5-item scale adapted from Kalichman et al. (2005). Two items reflect positive outcomes from testing, two assess adverse outcomes, and one item reflects HIV testing avoidance (see Table 7).

Table 7. Attitudes toward HIV testing measure.

Statement	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Getting tested for HIV helps people feel better.	0	1	2	3	4
Getting tested for HIV prevents people from getting HIV.	0	1	2	3	4
People in my life would leave me if I get HIV.	0	1	2	3	4
People who test HIV Positive should hide it from others.	0	1	2	3	4
I would rather not know if I have HIV.	0	1	2	3	4

Source: "HIV Testing Attitudes, AIDS Stigma, and Voluntary HIV Counseling and Testing in a Black Township in Cape Town, South Africa," by S. Kalichman & L. Simbayi, 2003, *Sexually Transmitted Infections, 79*, 444.

HIV/AIDS-related stigma. HIV/AIDS-related stigma was measured on a 5-item scale adapted from Kalichman et al. (2005). The scale assesses a broad range of stigma beliefs including repulsion, avoidance, and persecution derived from stigmatization theory (Kalichman, et al., 2005; see Table 8).

Table 8. HIV and AIDS - related stigma measure.

Statement	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
People who have HIV or AIDS are dirty.	0	1	2	3	4
People who have HIV or AIDS should be ashamed.	0	1	2	3	4
A person with HIV or AIDS must have done something wrong and deserves to be punished.	0	1	2	3	4
People who have HIV or AIDS should be isolated.	0	1	2	3	4
I do not want to be friends with someone who has HIV or AIDS.	0	1	2	3	4

Source: Development of a Brief Scale to Measure AIDS-Related Stigma in South Africa, by S. Kalichman, L. Simbayi, S. Jooste, Y. Toefy, D. Cain, C. Cherry, & A. Kagee, 2005, *AIDS and Behavior, 9*, 136.

Homosexual "Gay" Stigma. Gay stigma was measured on a 5-item scale. The scale assesses a broad range of stigma beliefs including perspectives on the frequency of homosexual men compared to heterosexual men receiving an HIV test (see Table 9).

Table 9. Gay stigma toward HIV testing measure.

Statement	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Most men with HIV are having sex with other men.	0	1	2	3	4
Only men having sex with other men need an HIV test.	0	1	2	3	4
If a man gets an HIV test he is probably gay.	0	1	2	3	4

Recruitment and Data Collection Procedures

This study followed a standardized protocol for all data collection procedures for each measure for quality assurance purposes. All primary data measures were collected on questionnaires. The investigator and trained recruitment team (3 Black females and 1 Black

male) used active street recruitment. Training was conducted with all research assistants and meetings were conducted after each recruitment visit for quality assurance. Methods used to recruit participants were flyers, business cards, and street outreach. The Investigator and recruitment team approached individuals and groups of Black men at homes, bus and subway stops, clubs, barber shops, bars, parks, liquor stores, community picnics, health fairs, social fairs, festivals, and church functions. Flyers were posted at local places (e.g., bus stops, parks, billiard halls, barber shops, grocery stores, community-based organizations, and churches) in Fulton and DeKalb counties. All flyers provided a description of the study and contact information.

All interested participants who did not complete the survey during the street recruitment method called the telephone number on the flyer. The individual was screened for eligibility on the phone or in person after obtaining consent from the individual. Potential participants were informed that the questionnaire focused on men's health and their home address or nearest cross-street to the home was needed for this study to examine access to healthcare facilities. Interested persons were asked their age and those who met the inclusion criteria (18 years of age and older, self-identify as Black, and currently live in Fulton or DeKalb Counties) were informed that the questionnaire included questions regarding their HIV testing history, demographic information, and healthcare utilization. Participants were given a bag of snacks (pretzels, granola bars) and water to compensate them for time spent completing the questionnaire. The questionnaire took approximately 15–20 minutes to complete. As an incentive, each participant was informed that a raffle would be conducted at the end of the study to randomly select three participants to receive a $50 gift card. All were informed there would be three gift cards that will be randomly selected from the pool of participants. The gift card was mailed to all three winning participants.

Data Entry and Data Management

Demographic data, access to HIV testing site information, and HIV testing history was collected on standardized questionnaires. Questionnaires were entered into a relational database using optical scanning software (TeleForms). For manually-collected information, the data form was independently reviewed at the time of data collection by the investigator and trained recruitment team to ensure all fields were completed and information was accurate. Databases were reviewed using standard programs to monitor for illogical, out-of-range, and incorrect data entries. Once the data was cleaned, these were exported to a permanent STATA 12 database for archiving and analysis.

Security for the electronic data files was critical and files were maintained on a locked computer, and backed up regularly on an external hard-drive. The investigators were the only individuals that had access to locked files.

Sample Size

The sample size of Black men completing the questionnaire was determined by the sample size formula.

Equation 5. Sample Size Formula

$$n = Z^2PQ / d^2$$

Source: *Survey Sampling*, by L. Kish, 1965, New York, NY, John Wiley & Sons.

n is the sample size or number of participants

z is the test statistic at 95% CI = 1.96

d is the precision of 5%

p is the prevalence of the study outcome (HIV testing in the past 12 months)

n = 1.96*1.96*.50*.50 / .05*.05

Theoretical sample size = 384

Account for a 10% nonresponse rate: 384/1 – 0.1 = 426 participants

Proportional sampling based on the overall population size was calculated to determine the sample size for each county.

129,000 (total number of Black men in DeKalb) + 140,000 (total number of Black men in Fulton) = 269,000

140,000/269,000 = 52% (Fulton) 129,000/269,000 = 48%

.52 * 426 = 222 (Fulton; see Table 10)

.48* 426 = 204 (DeKalb; see Table 10)

Table 10. Sample size for DeKalb and Fulton Counties.

	Number of participants needed
DeKalb County	204
Fulton County	222

Data Analysis

Specific Aim 2. Determine whether the transit distance (miles) between participant's home address and publicly-funded free HIV test site is associated with HIV testing in the past 12 months.

Descriptive Statistics

For continuous variables, summary statistics and histograms were examined. Frequency distribution tables were used to depict dichotomous and categorical variables.

Recoding

The continuous variable "age" was coded as categorical and continuous variables. Cutoff values were determined by the distribution of values in the dataset. All covariates collected are located in table 11.

Table 11. List of outcome, exposure, and covariate variables

Variable	Description	Distribution
Outcome		
HIV test	Have you been tested for HIV in the past 12 months?	Dichotomous
Main Exposure		
Distance	Distance to test site.	Continuous
Covariates		
Age	How old are you?	categorical
education	What is the highest grade you completed?	categorical
employment	Are you currently employed or working?	Dichotomous
salary	How much money do you make monthly?	categorical
welfare	Are you a welfare recipient?	Dichotomous
homeless	Currently homeless.	Dichotomous
Own car	Do you own or have your own vehicle?	Dichotomous
Regular doc	Do you have a regular doctor?	Dichotomous
insurance	Do you have health insurance?	Dichotomous
HIV test ever	Have you ever been tested for HIV?	Dichotomous
STI Test ever	Have you ever had a sexually transmitted disease test?	Dichotomous
prison	Have you ever been incarcerated in prison?	Dichotomous
jail	Have you ever been incarcerated in jail?	Dichotomous
Drug center	Have you ever been in a drug or alcohol treatment center?	Dichotomous
Perceived risk	Which of the following describes how likely it is that you are infected with HIV today.	Dichotomous
Attitude prevents	Getting tested for HIV prevents people from getting HIV.	Categorical
Attitude people	People in my life would leave me if I get HIV.	Categorical
Attitude hide	People who test Positive should hide it from others.	Categorical
Attitude not know	I would rather not know if I have HIV.	Categorical
Stigma dirty	People who have HIV or AIDS are dirty.	Categorical
Stigma ashamed	People who have HIV or AIDS should be ashamed.	Categorical
Stigma punish	A person with HIV or AIDS must have done something wrong and deserves to be punished.	Categorical
Stigma isolate	People who have HIV or AIDS should be isolated.	Categorical
Stigma friends	I do not want to be friends with someone who has HIV or AIDS.	Categorical
Phobic1	Most men with HIV are having sex with men	Categorical
Phobic2	Only men having sex with other men need an HIV test	Categorical
Phobic3	If a man gets an HIV test he is probably gay	Categorical

Correlation Matrix

The correlations between all covariates were assessed using the spearman rank correlation. Covariates with a correlation of r >0.65 were identified as highly correlated.

Assess Effect Measure Modification (EMM) and Confounding

A confounder is a variable associated with the outcome and the exposure but does not serve as an intermediate variable in the causal pathway between the exposure and outcome variable (Szklo & Nieto, 2007). A confounder distorts the true association of the main exposure and outcome toward the null of 1 (negative confounding) or away from the null of 1 (positive confounding). The effect measure modification (EMM) occurs when the effect of a risk factor on an outcome is not homogenous in strata formed by a third variable. Therefore, to assess the true relationship between transit distance and HIV testing in the past 12 months, all confounders and EMM must be identified and analyzed or reported accordingly. A manual stepwise process was taken to identify EMM and confounders of the relationship between transit distance and HIV testing in the past 12 months. The six steps taken were 1) identify the covariates that are associated with the nearest transit distance (main exposure), 2) identify the covariates that are associated with HIV testing in the past 12 months (outcome), 3) assess whether the covariate that is associated with transit distance and HIV testing in the past 12 months is an intermediate variable in the causal pathway between transit distance and HIV testing in the past 12 months, 4) identify the covariates that are an effect measure modification (EMM) of the prevalence ratio (PR), 5) identify the covariates that are confounders based on a 10% difference between the unadjusted and adjusted prevalence ratio, and 6) identify the covariates that are independent predictors of HIV testing in the past 12 months & provide a multivariate regression model that includes all identified EMM, confounders and independent predictors.

Bivariate Analysis

Step 1: Identify the covariates associated with the nearest transit distance (main exposure)

In step 1, Analysis of Variance (ANOVA) was used to assess the relationship between the covariates and nearest transit distance (main exposure). All covariates found to be statistically significant ($p<0.05$) were identified as covariates associated with transit distance (main exposure).

Step 2: Identify the covariates associated with HIV testing in the past 12 months (outcome)

In step 2, a chi-square analysis was conducted to examine the association between the covariates and HIV testing in the past 12 months (outcome). All covariates found to be statistically significant ($p<0.05$) were identified as covariates associated with HIV testing in the past 12 months (outcome).

Step 3: Assess whether the covariate associated with transit distance and HIV testing in the past 12 months is an intermediate variable in the causal pathway between transit distance and HIV testing in the past 12 months

All covariates were assessed to determine whether covariates were an intermediate variable in the causal pathway between the main exposure (transit distance) and outcome (HIV testing). All covariates that were not an intermediate variable in the causal pathway between the main exposure and outcome were identified as potential confounders. All covariates there were in the intermediate variable in the causal pathway between the main exposure and outcome were not identified as potential confounders.

Step 4: Identify the covariates that are EMM of the prevalence ratio (PR)

To assess effect measure modification (EMM) of the prevalence ratio, all potential confounders (covariates associated with the outcome and main exposure) were stratified by each

level and stratum-specific prevalence ratios for the association between the transit distance and HIV testing in the past 12 months and examined for homogeneity. The stratified specific prevalence ratio and the Breslow-Day test of $p < 0.20$ as significant were used to assess EMM.

Step 5: Identify the covariates that are confounders based on a 10% difference between unadjusted and adjusted prevalence ratio

To identify confounders of the transit distance and HIV testing in the past 12 months relationship, the crude prevalence ratio between transit distance and HIV testing in the past 12 months was determined using Poisson Robust Regression. Second, the covariates that were found to be statistically significantly ($p<0.05$) associated with transit distance and HIV testing in the past 12 months (potential confounders) were adjusted for one at a time using Poisson Robust Regression (Adjusted Prevalence Ratio). During this step, the interest of a change in estimate between the crude and adjusted prevalence ratio was priority. The difference was estimated using the formula: ln (crude/adjusted). A value of 0.1 or –0.1 indicated a 10% difference. If there was a 10% difference when adjusting for a particular covariate, that covariate was identified as a confounder.

Multivariate Analysis

Step 6: Identify the covariates that are independent predictors of HIV testing in the past 12 months & provide a multivariate regression model that includes all identified EMM, confounders and independent predictors

After putting all covariates that were found to be associated with transit distance and HIV testing in the past 12 months, and identified EMM (interaction terms) into the multivariate regression model, any non-significant at $p <0.20$ interaction term was not identified as an EMM and was removed from the model. All identified confounders remained in the model. However, if

step 5 did not identify any confounders (no 10% difference between the unadjusted PR and adjusted PR), then no covariates served as a confounder. If the potential confounder was not identified as a confounder and not statistically significant ($p > 0.05$), the covariate was removed from the regression model. If a potential confounder was not identified as a confounder; however, was statically significant ($p < 0.05$) when added to the regression model, the covariate was identified as an independent predictor of HIV testing in the past 12 months and remained in the regression model.

Phase III: Qualitative Study

Specific Aims 3. Identify factors that influence adult (18 years and older) Black men's decision to seek or not seek HIV testing.

Study Design Overview

This study is a qualitative, semi-structured, one-on-one interview with adult (18 years and older) Black men living in Fulton and DeKalb Counties. Twenty-six face-to-face, audio recorded interviews were administered at locations convenient to the participant (e.g., private room at a local library, barber shop, and adult male home).

Research Setting

This study was conducted in DeKalb and Fulton Counties in the State of Georgia. These two counties were selected due to the high HIV and AIDS prevalence among Black men.

Study Population

This study conducted 26 one-on-one, semi-structured interviews with adult (18 years and older) Black men.

Selection Criteria (see Appendix B)

Inclusion criteria:

1. Identify as male gender.
2. Self-identify as Black or African-American.
3. Aged 18 years and older.
4. Currently reside in Fulton or DeKalb County.
5. Able to speak and understand English.

Exclusion criteria: Black men who have completed the questionnaire from Specific Aim 2.

Recruitment

The study recruited Black men aged 18 years and older who resided in Fulton and DeKalb Counties. Methods used to recruit the participants were active recruitment, snowball sampling, flyers, and business cards. Snowball sampling is a non-probability sampling technique, whereby existing study subjects recruit future subjects from among their acquaintances. Recruitment flyers (see Appendix E) were posted at local places (e.g., bus stops, parks, billiard halls, barber shops, grocery stores, community-based organizations, and churches) in Fulton and DeKalb Counties. Recruitment cards (see Appendix D) were distributed at local events such as church services and festivals in the counties of interest. All recruitment cards provided information about the study and pertinent contact information. All interested participants called the telephone number provided on the flyer and business card to learn more about the study and to express interest in participating. Potential subjects were being screened for eligibility on the phone after obtaining consent from the individual (see Appendix F).

Data Collection

This study conducted 26 face-to-face, semi-structured, audio recorded interviews with study participants. The 80-minute interview took place in locations convenient to the participant (e.g., private room at a local library, barber shop, and adult male home). According to Ulin, Robinson, and Tolley (2005), highly sensitive topics, such as HIV testing history, HIV/AIDS-related stigma, and attitudes about HIV-infected individuals, may warrant use of the individual interview format (Ulin et al., 2005). Thirteen adult Black men were interviewed in each county (13 in DeKalb; 13 in Fulton) to examine the factors that affect their decision to seek and not to seek HIV testing. The investigator (female) conducted 13 interviews and a trained Black male conducted 13 interviews. Before the interview process began, the consent form was read aloud to the participant. The interviewer obtained a verbal consent from the participant on the audio recorder. Demographic information was collected after the participant gave verbal consent. The participant was allowed to create an alias name to protect his identity. Participants created alias first and last names. The participants received a bottle of water before beginning the interview. After the interview was completed, the participant received $15 compensation and granola bars for their time. All participants completed the interview without needing to leave before completing the interview; therefore, prorating the incentive was not necessary.

Interview Procedure

Interviews were conducted using an interview manual (see Appendix C). The interviews began with icebreakers to develop rapport with the participant. Gall, Borg, and Gall (1996) asserted that it is important for the researcher to develop rapport with participants when probing for personal and/or sensitive information. The interviewer read each question aloud to each participant to engage in a dialogue for data collection. After the interview was complete, the

interviewer explained the confidentiality procedures again and thanked the participant for his time, effort, and information.

Data Management

All study information was locked in a file cabinet in Atlanta, Georgia, and on a secure computer that is accessible with a password. Study information was not accessible to anyone outside of the research team.

Data Analysis

Ulin et al. (2005) proposed five basic steps in qualitative data analysis that allow for an inductive research process: (a) reading, (b) coding, (c) displaying, (d) reducing, and (e) interpreting. These steps were followed to conduct a thorough analysis of the data. First, the investigator took the time to thoroughly understand the data collected by reviewing all interviews. A transcribing company was hired to transcribe all interviews. After all interviews were conducted and transcribed, the transcription was reviewed to code all interviews. A line-by-line coding to identify themes that emerged from the transcript was conducted. Coding involved attaching labels to the pieces of text that represented emergent themes. Next, cross-referencing to identify common themes was conducted. A coding sheet was created to serve as a guide to continue coding the remaining interviews. If themes emerged in subsequent interviews that were not on the initial coding sheet, the coding sheet was adjusted accordingly. Interview transcripts were manually coded and analyzed using QSR NVivo 10 software.

CHAPTER 4

RESULTS

Phase I: Ecological Study

Phase I is an ecological study that used secondary data from the American Community Survey (2005–2009) and Georgia Department of Public Health to (a) identify geographic locations of publicly-funded free HIV test sites, and (b) examine poverty levels among Black men by census tracts in DeKalb and Fulton counties, Georgia. Phase I analyzed data using the Moran's Index Auto Correlation, and Getis-Ord *G** for cluster analysis.

Abstract

Purpose: Limited research has examined the distance (miles) between poor neighborhoods among Black men and publicly funded free HIV test sites. **Design:** An ecological study was used to assess the geographic access to publicly funded HIV test sites that offer free HIV test from census tracts with high proportions of Black men living below the poverty level. Poverty level data by census tract were obtained from the American Community Survey 2005 to 2009. **Objective:** Phase I determined if transit distance (miles) to publicly funded free HIV testes differ between census tracts by poverty level in DeKalb and Fulton Counties of Georgia. Phase I geographically located (a) publicly funded free HIV test sites (b) census tracts with high proportions of Black men living below the poverty level (c) assessed the relationship between transit distance and poverty levels, and (d) compared transit distance to the nearest publicly funded free HIV test sites between poor and not poor census tracts among Black men.

Results

Overall, Georgia has 159 Counties. The two Georgia counties studied for this aim were DeKalb and Fulton Counties (Figure 7). Within the two studied counties, census tracts were the unit of analysis. Census tracts are small, relatively permanent geographic subdivisions of a county, sometimes called neighborhoods (Lo & Yeung, 2007). In 2010, the United States poverty threshold (level) for one person under the age of 65 was an annual salary of less than $11,344 (U.S. Census Bureau, 2012). Census tracts with greater than 50% of people living below the poverty level are identified as census tracts with high proportions of individuals living below the poverty level.

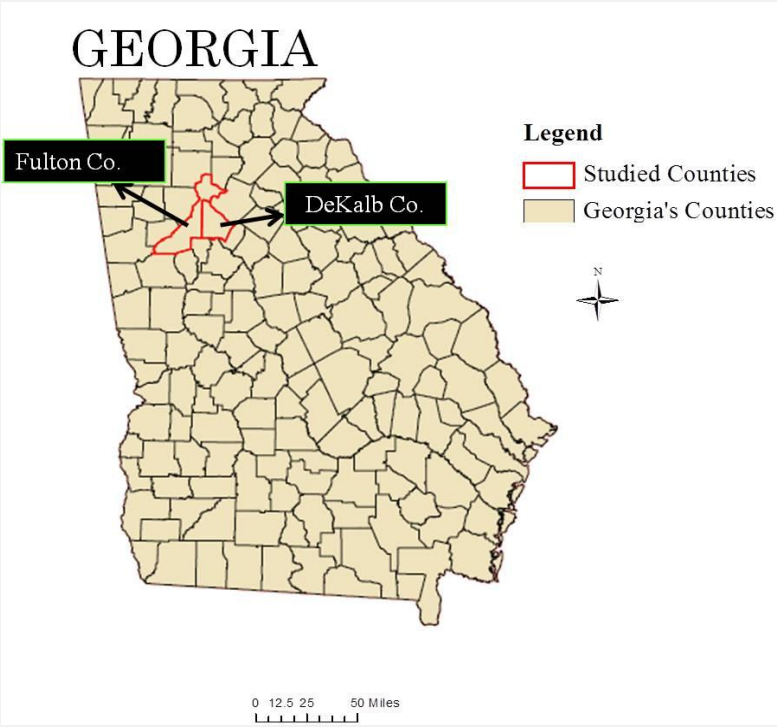

Figure 7. Map of Studied Counties of Georgia.

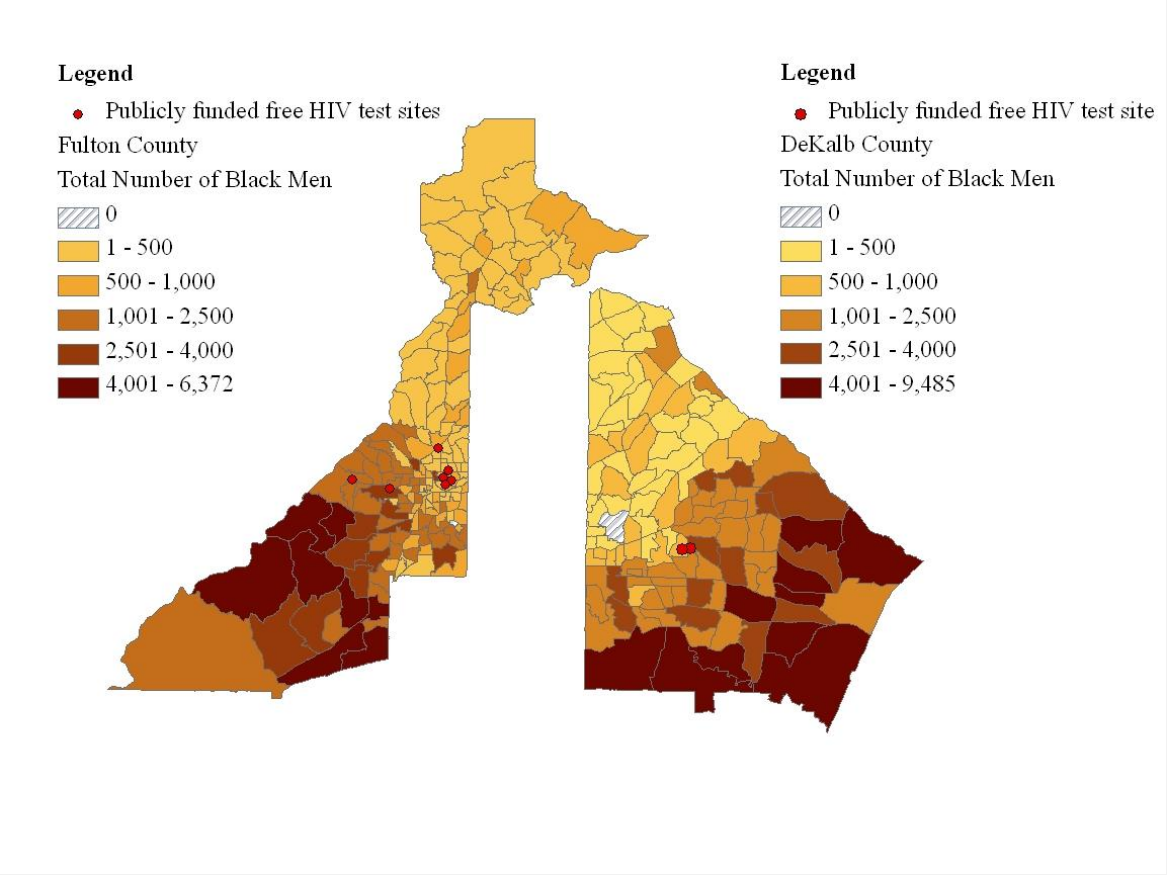

Figure 8. Population density map among Black men in Fulton and DeKalb Counties, Georgia 2005-2009.

In total, there are 271 census tracts in DeKalb and Fulton Counties. Overall, 269 census tracts for DeKalb and Fulton Counties were analyzed in this specific aim. Two census tracts were removed due to zero Black men living within that census tract. Figure 8 provides a visual depiction of the population density among Black men in DeKalb and Fulton Counties, Georgia (see Figure 8). In total, there were 355,155 males of all races and ethnicities that resided in DeKalb County and 485,887 men that resided in Fulton County between 2005-2009 (see Table 12). There were two publicly funded free HIV test sites located in DeKalb County. In DeKalb County, there was 1 publicly funded free HIV test site per 91,871 Black males, 63,124 White males, and 22,221 Hispanic males (Table 12). There were seven publicly funded free HIV test

sites in Fulton County. In Fulton County, there was 1 publicly funded free HIV test site per 28,201 Black males, 34,215 White males, and 6,592 Hispanic males (see Table 12).

Table 12. The number of publicly funded free HIV test sites per population by race/ethnicity

		Number of Persons per 1 Publicly Funded Free HIV Test Sites by Race/Ethnicity	
Population		**DeKalb Co.***	**Fulton Co.***
Total population	DeKalb: 733,060 Fulton: 987,148	1 site per 366,530	1 site per 141,021
Male population (all race/ethnicities)	DeKalb: 355,155 Fulton: 485,887	1 site per 177,577	1 site per 69,412
Black male population	DeKalb: 183,742 Fulton: 197,413	1 site per 91,871	1 site per 28,201
White male population	DeKalb: 126,249 Fulton: 239,509	1 site per 63,124	1 site per 34,215
Hispanic male population	DeKalb: 44,443 Fulton: 46,150	1 site per 22,221	1 site per 6,592

***** 1 publicly funded free HIV test site per population

Source: U.S Census Bureau (2005-2009) American Community Survey

DeKalb County

DeKalb County had a total of 104 census tracts, where the results showed:

- Poverty (Figure 9):
    - Four (3.8%) census tracts had more than 50% Black men living *below* poverty level,
    - Ninety-nine (95.2%) census tracts had more than 50% Black men living at and *above* the poverty level, and
    - One (0.96%) census tract in DeKalb County was found to not have any Black men residing in that census tract; therefore, was excluded from the analysis.

- The four neighborhoods that were identified as having more than 50% Black men living below the poverty level were Druid Hills, North Druid Hills, Edgewood, and Downtown Decatur (Figure 9).

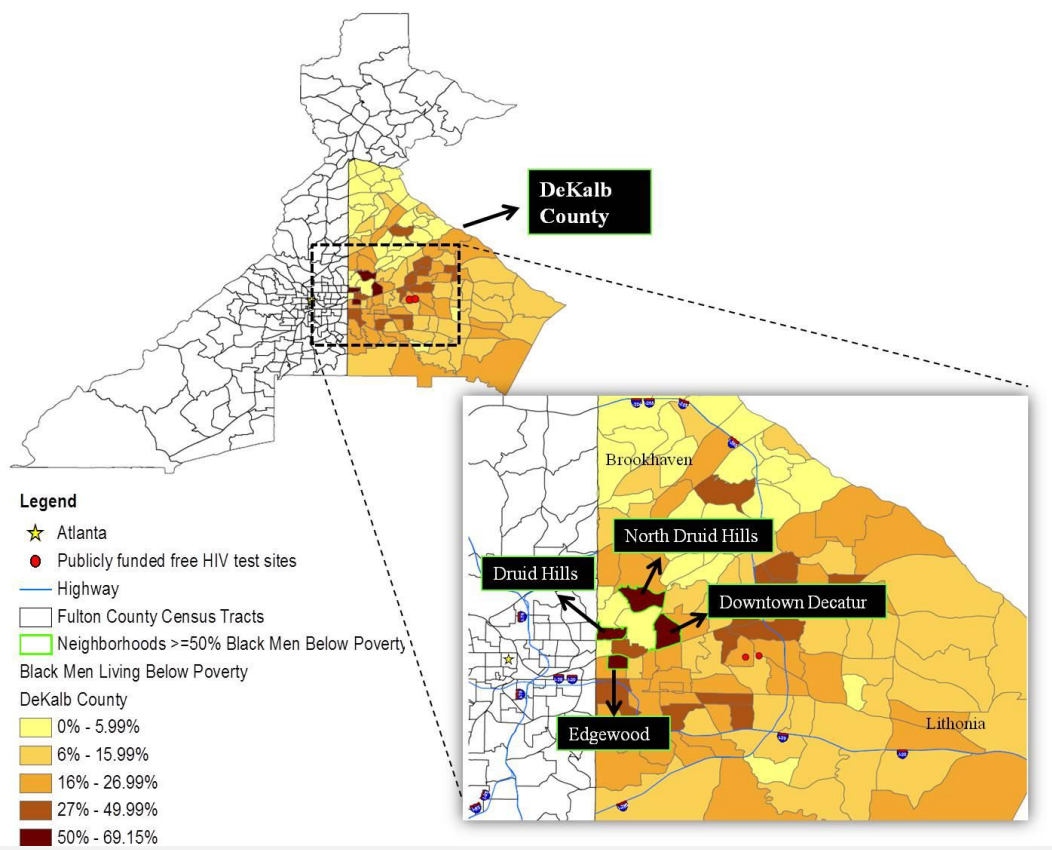

Figure 9. Neighborhoods with high proportions of Black men living below the poverty level, DeKalb County, Georgia, 2005–2009.

- Publicly-funded free HIV test sites (Figure 10):
  - Two publicly-funded free HIV test sites were located in DeKalb County,
  - Zero publicly-funded free HIV test sites were located within a census tract with greater than 50% of Black men living *below* poverty level.
  - The two publicly-funded free HIV test sites were Standing To Achieve New Direction (S.T.A.N.D) Inc., and Recovery Consultants Inc.

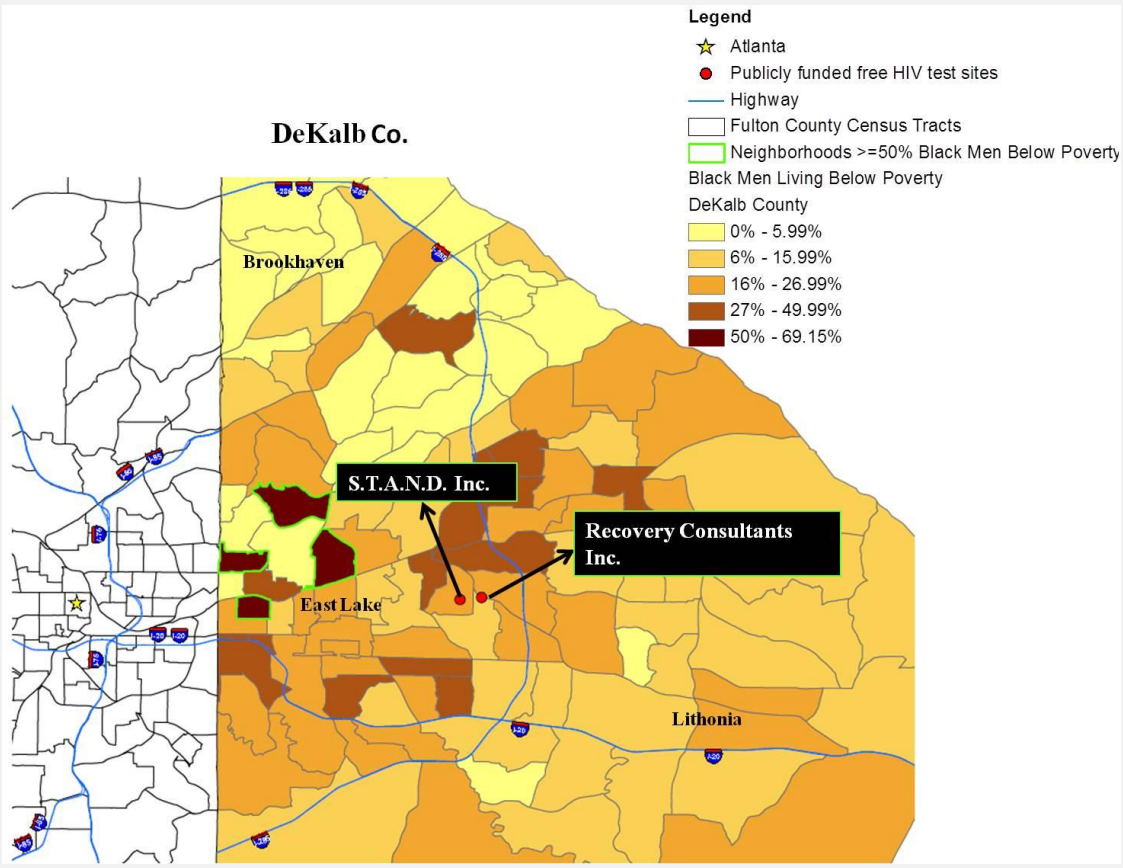

Figure 10. Publicly-funded free HIV test sites (2012) by census tract and poverty level (2005–2009), DeKalb County, Georgia.

Fulton County had a total of 167 census tracts, where the results showed:

- Poverty (see Figure 11)
  - Twenty (12%) census tracts had more than 50% of Black men living *below* poverty level,
  - One hundred and forty-four (86.2%) census tracts had more than 50% Black men living at and *above* poverty level, and
  - 1 (0.6%) census tract did not have any Black men residing in that census tract; therefore, was excluded from the analysis.
  - The 34 neighborhoods identified as having more than 50% Black men living below the poverty level were: Atlanta Industrial Park, English Park, Monroe

Heights, Brookview Heights, Knight Park/Howell Station, Bankhead, English Avenue, Ashview Heights, Just Us, The Villages at Castleberry Hill, Downtown, Old Forth Ward, Sweet Auburn, Mechanicsville, Pittsburgh, Choosewood Park, Englewood Manor, Thomasville Heights, Leila Valley, Norwood Manor, Atkins Park, Virginia Highland, Wildwood, Springlake, Collier Hills, Memorial Park, Argonne Forrest, Tuxedo Park, Chastain Park, East Chastain Park, Rockdale, West Highlands, Englewood Manor, Cabbagetown, and Reynoldstown.

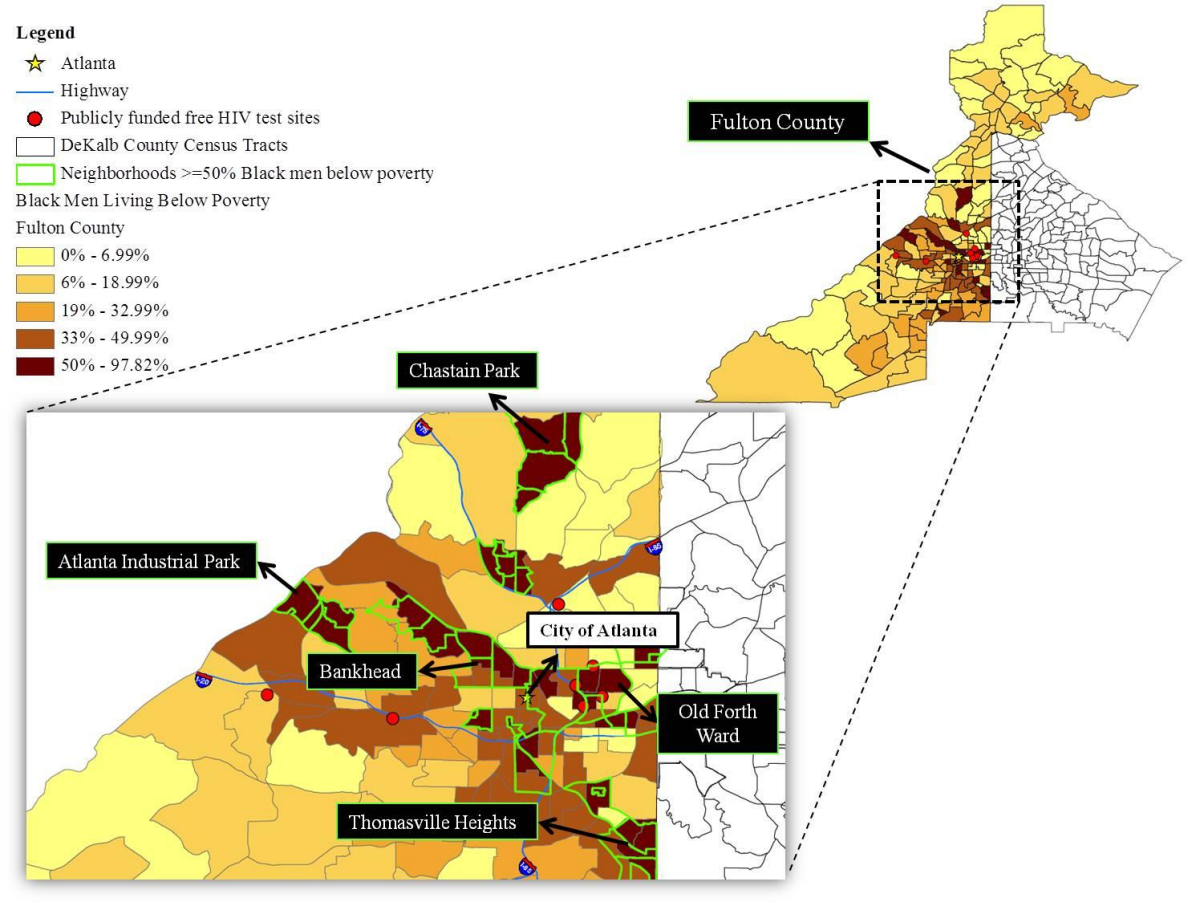

Figure 11. Neighborhoods with high proportions of Black men living below the poverty level, Fulton County, Georgia, 2005–2009.

- Publicly-funded free HIV test sites (Figure 12):
    - Seven publicly-funded free HIV test sites were located in Fulton County, and

- Four (57%) publicly-funded free HIV test sites were located within a census tract with greater than 50% of Black men living *below* the poverty level.
- The seven publicly-funded free HIV test sites were AID Atlanta, Positive Impact, Evolution Center, Community Advance Practice Nurses Clinic, Grady Clinic, Sister Love Inc., and National AIDS Education & Services for Minorities (NAESM).

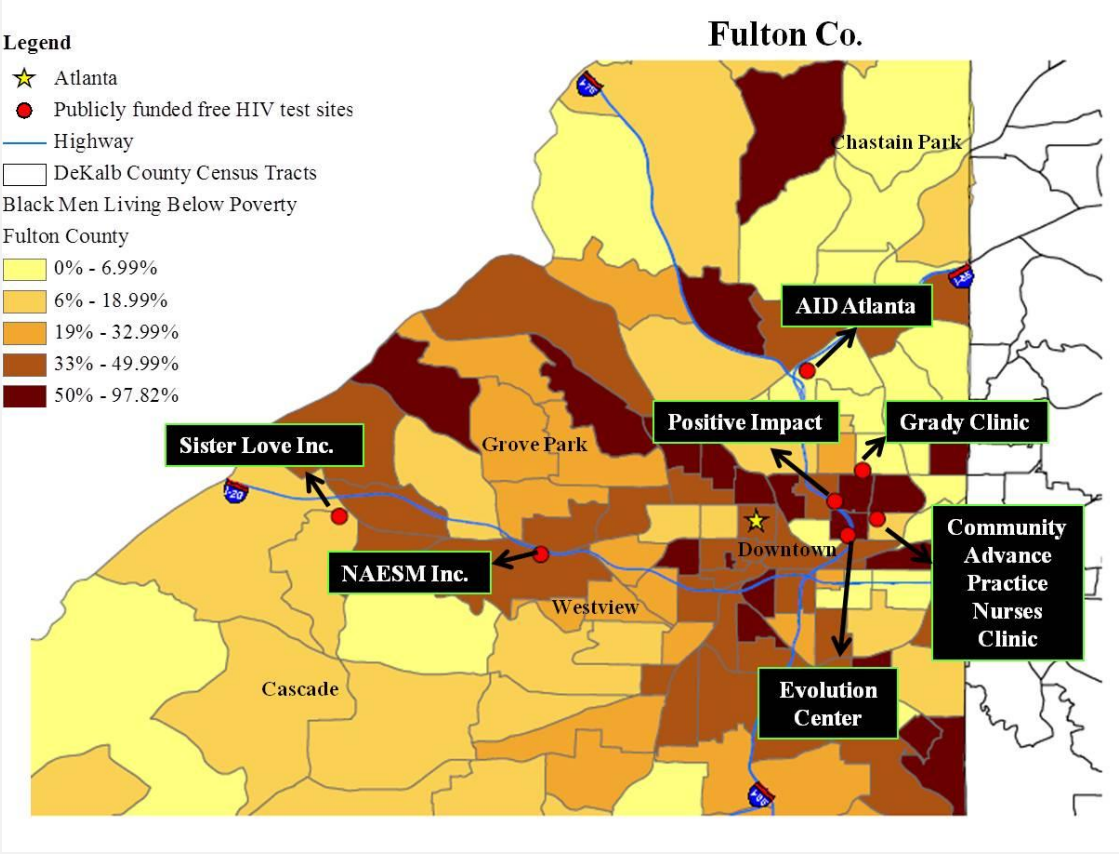

Figure 12. Publicly-funded free HIV test sites (2012) by census tract and poverty level (2005–2009), Fulton County, Georgia.

Spatial Autocorrelation

It is hypothesized that within DeKalb and Fulton Counties of Georgia census tracts with high proportions of adult Black men living below the poverty level neighbor other census tracts with high proportions of adult Black men living below the poverty level. Spatial autocorrelation

tools statistically test whether the observed value of a variable (poverty) at one locality is independent of values of the variable (poverty) at neighboring localities (Wong & Lee, 2005). The Moran's I autocorrelation test was used to statistically test the null hypothesis of no spatial autocorrelation. The Moran's I index values range from −1 (indicating perfect dispersion) to +1 (perfect correlation). A zero value indicates a random spatial pattern. For statistical hypothesis testing, Moran's I values can be transformed to Z-scores in which values greater than 1.96 or smaller than −1.96 indicate spatial autocorrelation that is significant at the 5% level. ArcMap 10 was used to examine the spatial clustering of Black men living below the poverty level in DeKalb and Fulton Counties.

To create a map that allows one to visually identify the spatially correlated clustered census tracts with high proportions of Black men living below poverty, the hot spot analysis tool was used to calculate the local Getis-Ord Gi* statistic (G-statistic) for each census tract in the dataset. A local indicator of spatial autocorrelation such as the local G-statistic evaluates the existence of clusters in the spatial arrangement of poverty by census tracts (Wong & Lee, 2005). The local G-statistic is derived for each areal unit (census tract) to indicate how the value (poverty status) of the census tract is associated with the value (poverty status) of the surrounding census tracts (Wong & Lee, 2005). The G-statistic returned for each census tract in the dataset is a *z*-score. To obtain the standardized score, the expected value and variance of the statistic must be known. The *z*-score, *p*-value, and the expected and observed values are calculated by ArcMap 10. Resultant *z*-scores and *p*-values indicate where census tracts with either high or low proportions of adult Black men living below the poverty level cluster spatially. For positive *z*-scores, census tracts with high proportions of Black men living below the poverty level neighbor census tracts with high proportions of adult Black men living below the poverty

level (high–high: high poverty cluster). For negative *z*-scores, census tracts with low proportions of Black men living below the poverty level neighbor census tracts with low proportions of adult Black men living below the poverty level (low–low: low poverty cluster). Table 13 and 14 provide the results of the spatial autocorrelation for DeKalb and Fulton Counties using the Moran's I.

After conducting the analysis, it was necessary to reject the null hypothesis that there is no spatial autocorrelation between census tracts with high proportions of adult Black men living below the poverty level for DeKalb County (z: 3.72; $p < .01$) and Fulton County (z: 4.33; $p < .01$; see Tables 13 and 14). Therefore, neighborhoods of high poverty among Black men cluster other neighbors with Black men living below poverty.

Table 13. Spatial autocorrelation in DeKalb County using Moran's Index

Moran's Index	0.212
z-score	3.718
p-Value	0.000*

*p-value < 0.05 = significant

Table 14. Spatial autocorrelation in Fulton County using Moran's Index

Moran's Index	0.220
z-score	4.325
p-Value	0.000*

*p-value < 0.05 = significant

To visually examine impoverished census tracts among Black men that are spatially clustered, Getis-Ord *G** (see Figure 13) was used to identify

1. Strongly correlated census tracts with *high* proportions of Black men living below the poverty level (high poverty cluster), and

2. Strongly correlated census tracts with *low* proportions of Black men living below the poverty level (low poverty cluster).

Figure 13 provides a choropleth map showing the statistically significant ($p < .05$) clustered census tracts with *high* concentrations of Black men living below the poverty level and *low* concentrations of Black men living below the poverty level.

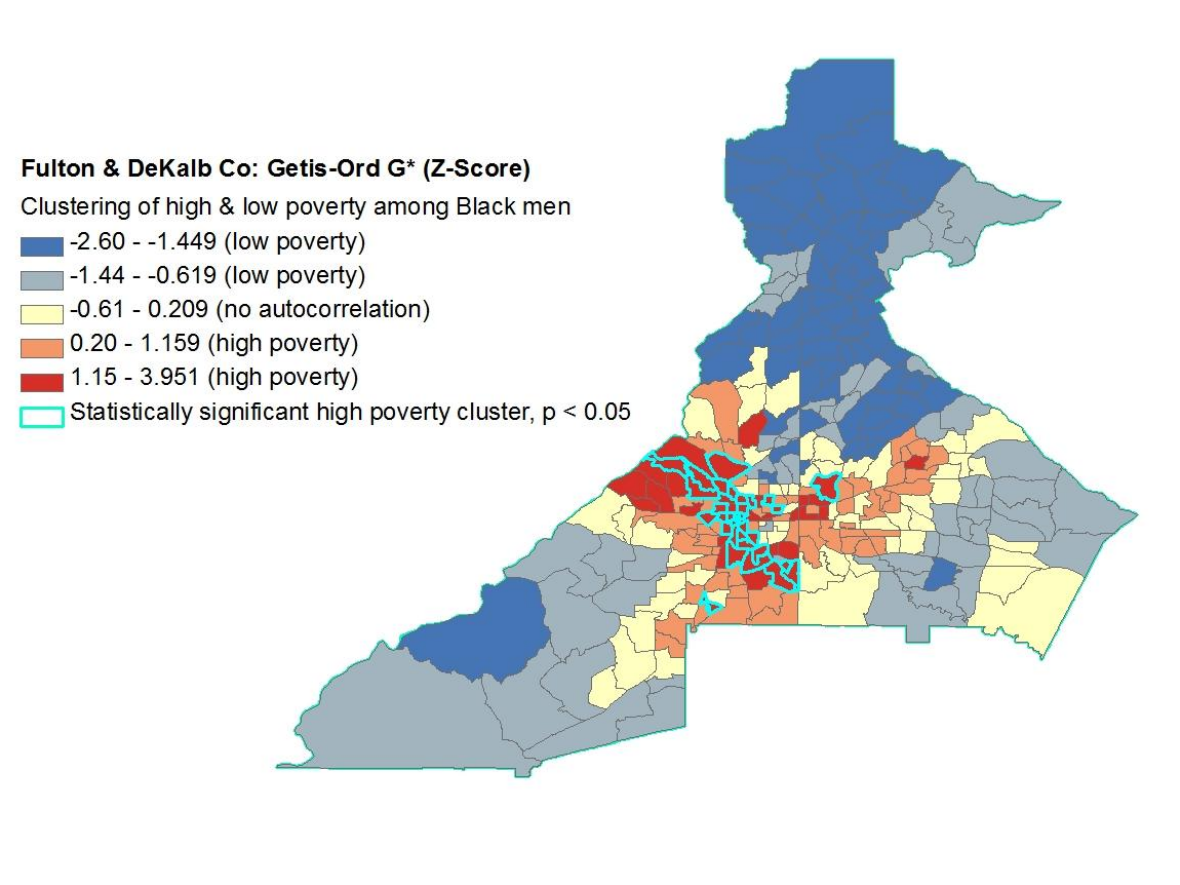

Figure 13 Hot spot analysis of Black men living below poverty by census tract using Getis-Ord *G**, DeKalb and Fulton Counties, Georgia, 2005–2009.

Transit distance (miles) was analyzed using (a) the nearest distance (mile) between the center of a census tract and a publicly-funded free HIV test site, and (b) the average distance to all publicly-funded free HIV test sites. Two distances were used to examine the difference between the two measurements to identify the most appropriate distance to use when exploring

access to these testing sites. Therefore, a sensitivity analysis was conducted on both transit distance measures: nearest transit distance and average transit distance to publicly-funded free HIV test site.

Nearest Transit Distance (miles)

The correlation between transit distance (miles) and the proportion of Black men living below the poverty level among census tracts was assessed using the spearman's correlation test. The spearman's correlation test showed a low negative correlation between transit distance (miles) and the proportion of Black men living below the poverty level in DeKalb (r = - 0.18) and Fulton (r = - 0.36) Counties. In DeKalb and Fulton Counties, as the proportion of Black men living below the poverty level increased the transit distance (miles) to the nearest publicly funded free HIV test site decreased (see Figure 14).

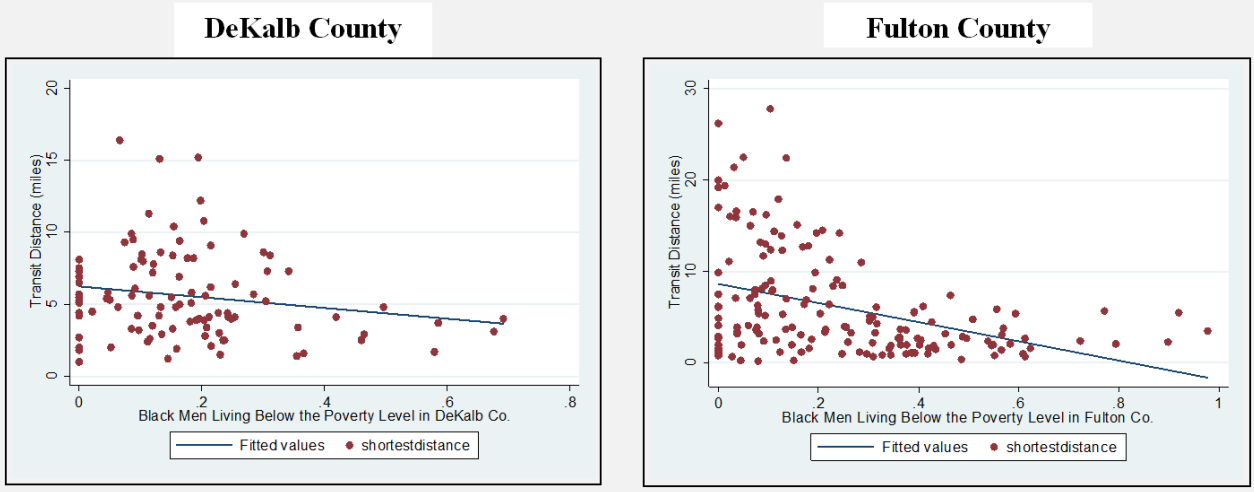

Figure 14. Proportion of Black men living below the poverty level and transit distance (miles) scatterplot, DeKalb and Fulton Counties, Georgia.

Simple linear regression model

A simple linear regression model was used to determine how the average transit distance (miles) from the center of a census tract to the nearest publicly funded free HIV test site varied

with the proportion of Black men living below the poverty level by census tracts in DeKalb and Fulton Counties, Georgia.

Fulton County

Among census tracts where Black men reside in Fulton County, the transit distance to the nearest publicly funded free HIV test site decreased 10.45 miles for each one unit increase in the proportion of Black men living below the poverty level within a census tract ($p < 0.01$; see Table 15). Among census tracts with 100% of Black men living at and above the poverty level, the average transit distance to the nearest publicly funded free HIV test site is 8.6 miles. The proportion of Black men living below the poverty level explained an estimated 15% of the variation in transit distance between the center of a census tract and the nearest publicly funded free HIV test site ($R^2 = 0.15$).

Table 15. Simple Linear Regression of transit distance (miles) between center of census tract and publicly funded free HIV test site, by Fulton County census tracts with Black men living below the poverty level, 2005-2009

Census Tracts in Fulton County	**intercept**	**coefficient**	**R^2**	**p-value**
Transit distance (miles) between center of a census tract and nearest publicly funded free HIV test site	8.63	-10.45	0.15	< 0.01*

*Statistically significant $p < 0.05$

DeKalb County

Among census tracts where Black men reside in DeKalb County, the transit distance to the nearest publicly funded free HIV test site decreases 3.75 miles for each one unit increase in the proportion of Black men living below the poverty level within a census tract ($p = 0.07$; see Table 16). Among census tracts with 100% of Black men living at and above the poverty level, the average transit distance to the nearest publicly funded free HIV test site is 6 miles. The proportion of Black men living below the poverty level explained an estimated 3% of the

variation in transit distance between the center of a census tract and the nearest publicly funded free HIV test site ($R^2 = 0.03$).

Table 16. Simple Linear Regression of transit distance (miles) between center of census tract and publicly funded free HIV test site, by DeKalb County census tracts with Black men living below the poverty level, 2005-2009

Census Tracts in DeKalb County	**intercept**	**coefficient**	**R^2**	**p-value**
Transit distance (miles) between center of a census tract and nearest publicly funded free HIV test site	6.24	-3.75	0.03	0.07

Transit Distance and Poverty Level by Census Tracts: DeKalb and Fulton Counties

The transit distance (miles) between the center of census tracts (geographic centroid) and the nearest publicly funded free HIV test center has a median of 4.4 miles (mean: 5.9, *SD* = 4.9). The transit distance is positively skewed where 50% of census tracts range from 0.2 mile to 4.4 miles from a studied HIV testing site (see Figure 15). DeKalb County census tracts are slightly further from the nearest publicly funded free HIV test sites (Median: 5 mile, *SD* = 3.1), than Fulton County (Median: 4 miles, *SD* = 5.7).

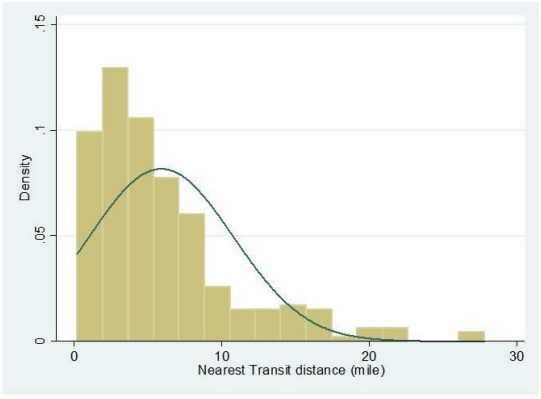

Figure 3: Histogram of transit distance (mile) to the nearest publicly funded free HIV test center by census tracts, DeKalb and Fulton Counties, Georgia, 2005-2010

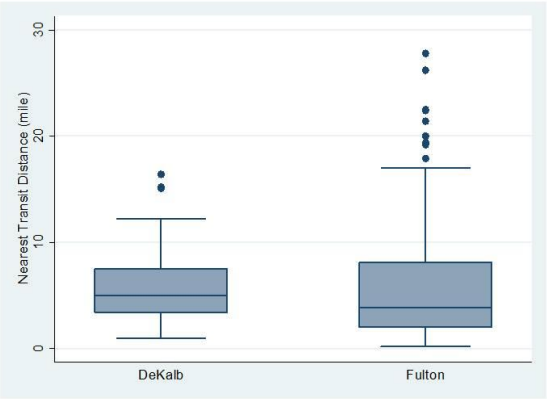

Figure 4: Box plot of transit distance (mile) to the nearest publicly funded free HIV test center by census tracts and county, DeKalb and Fulton Counties, Georgia, 2005-2010

Figure 15. Distribution of nearest transit distance between publicly-funded free HIV test sites and centroid of census tracts, DeKalb and Fulton Counties, Georgia, 2005–2009.

The transit distance (mile) between the center of census tracts (geographic centroid) and nearest publicly funded free HIV test sites by poverty level in DeKalb and Fulton Counties has a median of 4.8 miles (SD = 4.9) among census tracts with high proportions of Black men living above the poverty level, and 2.35 (SD = 1.6) miles among census tracts with high proportions of Black men living below the poverty level (see Figure 16). The transit distance ranged from 0.2 miles to 27.8 miles among census tracts with high proportions of Black men living above the poverty level, and 0.7 miles to 5.9 miles among census tracts with high proportions of Black men living below the poverty level (see Figure 16).

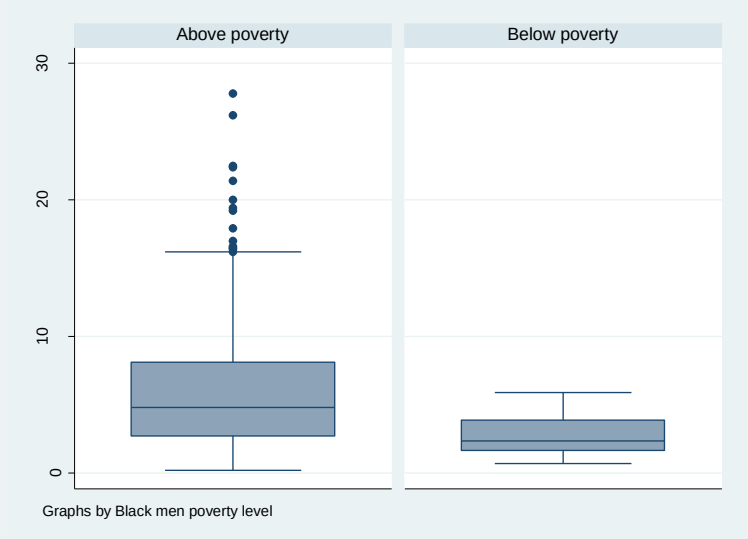

Figure 16. Distribution of transit distance between nearest publicly-funded free HIV test sites, by poverty and centroid of census tracts, DeKalb and Fulton Counties, Georgia, 2005–2009.

It was hypothesized that there is a difference in transit distance (miles) to the nearest publicly funded free HIV test between census tracts with high proportions of Black men living below the poverty level and census tracts with high proportions of Black men living above the poverty level. The null hypothesis of no difference in transit distance was tested using the Wilcoxon rank-sum test (Mann-Whitney U 2 Sample test). The Wilcoxon rank-sum test is used to compare the means of the two independent groups where data are non-normally distributed.

The Wilcoxon rank-sum test analyzes the equality of the sample medians rather than the means. The theory of the test is that if the two samples are similar, their medians will also be similar and the mean ranks will be equal. If one mean rank is larger, then that sample must have more observations than the other. The Wilcoxon rank-sum test then determines how different the two mean ranks are by using the *t*-statistic. Table 17 provides the results from the Wilcoxon rank-sum test. After conducting the analysis, the null hypothesis of no difference in transit distance was rejected at a significant level of $p<0.05$. There was statistically significant evidence that showed a difference in transit distance to publicly funded free HIV test sites between census tracts with greater than 50% of Black men living below the poverty level and census tracts with greater than 50% of Black men living at and above the poverty level in DeKalb and Fulton Counties, Georgia (z: 3.89; $p < 0.01$) (see Table 17). Census tracts with high proportions of Black men living below the poverty level have a shorter transit distance (median = 2 miles) to the nearest publicly funded free HIV test site than census tracts with high proportions of Black men living at and above the poverty level (median = 5 miles).

Table 17.Wilcoxon Rank-Sum test comparing transit distance (miles) between the nearest publicly-funded free HIV test center and census tracts with high proportions of Black men living below the poverty level, DeKalb and Fulton Counties, Georgia, 2005–2009.

DeKalb and Fulton census tracts	*n*	Transit distance (miles) Median (SD)	Range	*z*	*p* value
Census tracts with greater than 50% Black men living above poverty	245	5 (4.9)	(0.2-27.8)	3.89	0.00*
Census tracts with greater than 50% Black men living below poverty	24	2 (1.6)	(0.7-5.9)		
Total	269	Difference 3 miles			

*P-value < 0.05 = statistically significant

Summary: Phase I

In summary, this specific aim determined whether there was a relationship between the location of publicly-funded free HIV test sites and neighborhoods with high concentrations of poverty among Black men in DeKalb and Fulton Counties of Georgia. There were several findings within Specific Aim 1. First, results showed majority of the neighborhoods with high proportion (> 50%) of Black men living below the poverty level were located in the downtown area of Atlanta, Georgia. The findings were supported with cluster analysis and geospatial analysis of transit distance to better understand where clustered neighborhoods with high proportions of Black men are located. Understanding the location of these impoverished neighborhoods is important because literature shows that neighborhoods with high HIV and AIDS rates are highly correlated with low-income neighborhoods.

Second, the findings showed a significant difference in transit distance to the studied publicly-funded free HIV test sites between impoverished Black neighborhoods and neighborhoods with low proportions of poverty among Black men. Neighborhoods that had high proportions of Black men living below the poverty level were closer in transit distance by mileage to the nearest publicly funded free HIV test site than neighborhoods with high proportions of Black men living at and above the poverty level. By identifying the location of publicly-funded free HIV test sites, it was found that more test sites were located in neighborhoods with high poverty than neighborhoods with low poverty among Black men. Phase I provided pertinent information needed to evaluate the accessibility of publicly-funded free HIV test sites among impoverished neighborhoods among Black men. Phase I examined this relationship at a neighborhood level. Phase II will delve further into the role that "geographic access" plays by examining this relationship at an individual level to determine whether Black

men who live closer to publicly-funded free HIV test sites are more likely to have a recent HIV test in the past 12 months than Black men who live further from these sites.

Phase II: Cross-Sectional Study

Abstract

Purpose: Limited research has determined whether transit distance (miles) to publicly funded free HIV test sites is associated with HIV testing in the past 12 months among Black men. **Design:** A cross-sectional study design used primary data collection methods to assess the association between transit distance and HIV testing in the past 12 months, and identify confounders, effect measure modification (EMM), and independent predictors on the transit distance and HIV testing in the past 12 months relationship. **Objective:** Phase II hypothesized that the closer a publicly funded free HIV test site is to a Black male home residence the more likely he is to test for HIV in the past 12 months. Phase II determined whether the transit distance (miles) between a participants home address and nearest publicly funded free HIV test site is associated with HIV testing in the past 12 months among Black men.

Derivation of Analytic Sample

In Phase II, one of the first steps in this cross-sectional study was to develop a survey to collect information from Black men currently residing in the DeKalb and Fulton Counties of Georgia concerning their home address, socio-demographic characteristics, HIV testing history and attitudes about HIV and HIV testing. This survey was presented to Black men from July 2012 to September 2012. Sourcing locations used to actively recruit the potential participants were gyms, festivals, churches, bus stops, barber shops, parks, outside of clubs/bars, and BBQs in the Fulton and DeKalb areas of Georgia. The survey took approximately 7–10 minutes to complete, depending on the participant.

This active recruitment resulted with 664 Black men being approached to complete the survey. Of the 664 potential participants, 589 completed the survey, yielding a response rate of 88.7%. Of the 589 potential participants, the following were removed from the analyses: 31 (5.26%) who completed the survey but were not eligible due to living outside of the studied counties, 39 (6.62%) individuals who reported HIV positive, and 6 (1.01%) individuals who were 70 years old or older (see Figure 17).

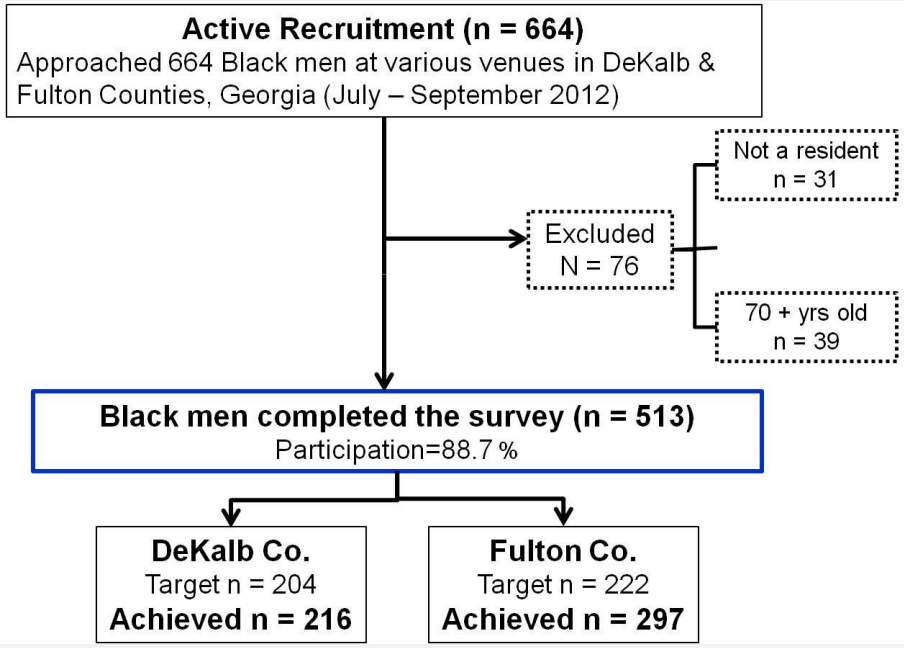

Figure 17. Flowchart diagram of recruitment and enrolled Black men who currently reside in DeKalb and Fulton Counties-Georgia, 2012.

Participant Characteristics

Of the 513 participants, the majority (68%) were men between the ages of 18–39 years old, heterosexual (78%), employed (67%), earned less than $1,000 a month, and the median transit distance (miles) between the participant's home address and the nearest publicly funded free HIV test site was 4.4 miles (see Table 18).

Table 18. Demographics of 513 Black men, DeKalb and Fulton Counties, Georgia, 2012

Characteristics	*N* (%)
Transit Distance (miles) to nearest publicly funded free HIV test clinic	
Median	4.4 miles
< 4.4 miles	254 (49.51)
> = 4.4 miles	259 (50.49)
Standard deviation (SD)	4.9
Range	0.1 – 37
Average Transit Distance (miles) to all publicly funded free HIV test clinic	
Median	11.2 miles
< 11.2 miles	256 (50)
> = 11.2 miles	257 (50)
Standard deviation (SD)	5.8
Range	5.8 – 48
Age	
Median (SD)	31 (12)
18–29 years	237 (46.20)
30–39 years	114 (22.22)
40–49 years	98 (19.10)
50–69 years	64 (12.48)
County of current residence	
DeKalb	216 (42.11)
Fulton	297 (57.89)
Educational Attainment	
12th grade or less	146 (28.46)
GED	48 (9.36)
Some college or associate's degree	151 (29.43)
Bachelor's or higher	168 (32.75)
Employment	
Employed	345 (67.25)
Not Employed	168 (32.75)

Characteristics	*N* (%)
	table continues
Monthly Salary (Gross)	
No Income	116 (22.61)
$1 to $500	58 (11.31)
$501-$1,000	108 (21.05)
$1,001- $1,500	80 (15.59)
>$1,501	151 (29.43)
Welfare	
No	439 (85.58)
Yes	74 (14.42)
Currently Homeless	
No	457 (89.08)
Yes	56 (10.92)
Arrested	
No	296 (57.70)
Yes	217 (42.30)
Penitentiary	
No	457 (89.08)
Yes	56 (10.92)
Drug or Alcohol Center	
No	449 (87.52)
Yes	64 (12.48)
Gender of sexual partner/s	
Women	402 (78.36)
Men	73 (14.23)
Women and Men	33 (6.43)
Transgender	5 (0.97)

Demographic comparison between study population and general population among Black men

To compare the demographics between Black men in the study population and the general population of Black men in DeKalb and Fulton Counties, secondary data collection methods were used to assess the county-level demographics of Black men living within these two counties using the American Community Survey from 2007-2011. From the analysis, the study population of 513 Black men had similar demographic characteristics as the general population of Black men in DeKalb and Fulton Counties. Majority (67%) of the Black men in the study were employed, and based on county-level data (ACS 2007-2011) majority of the general population of Black men in DeKalb and Fulton Counties were employed (87% - 89%) (see Table 19). The educational attainment was slightly different between groups. Thirty-three percent of Black men in the study earned a Bachelor or higher degree, and 23% to 26% of the general population of Black men in DeKalb and Fulton Counties earned a Bachelor or higher degree. The median age among Black men in the study population was slightly younger than the median age among the general population of Black men. (31 years old vs. 34 years old) (see Table 19).

Table 19. Socio-demographics among Black men in Phase II study population and total population of Black men in DeKalb and Fulton Counties.

	Study Population Black Men	**DeKalb County Black Men**	**Fulton County Black Men**
Employment	n (%)	n (%)	n (%)
Employed	345 (67)	103,116 (87)	108,516 (89)
Unemployed	168 (34)	15,245 (13)	13,348 (11)
Educational Attainment			
Less than High School	43 (9)	12,488 (12)	16,378 (15)
High School or GED	151 (29)	32,468 (32)	34,587 (32)
Some College or AA	151 (29)	34,033 (33)	30,438 (28)
Bachelor degree or higher	168 (33)	23,088 (23)	28,314 (26)
Age			
Median	31 (SD=12)	34 (+/-0.2)	34 (+/-0.1)

Source: American Community Survey 2007-2011

HIV Testing

Some participants did not know or did not want to share their HIV status on the survey (see Figure 18). Most (81.09%) stated they were HIV-negative (HIV-positive individuals were excluded from the analyses). The reason HIV- positive Black men were excluded from the analyses was due to the main outcome variable: receiving an HIV test in the past 12 months. The reason HIV-positive individuals may not have an HIV test in the past 12 months may be due to the fact of already knowing their status instead of transit distance serving as the reason for not obtaining an HIV test. For the results to avoid inaccuracy of reasons for not having an HIV test in the past 12 months, these individuals were excluded from the analyses. Majority of participants had taken an HIV test and an STI test at least once in their lifetime (81%); however, 44% had not taken an HIV test in the past 12 months and 19% had never taken an HIV test in their lifetime (see Figure 19). Among the individuals who received an HIV test at least once, 38% obtained the test in a private doctor's office and 17% received it at an STI or HIV clinic (see Figure 20).

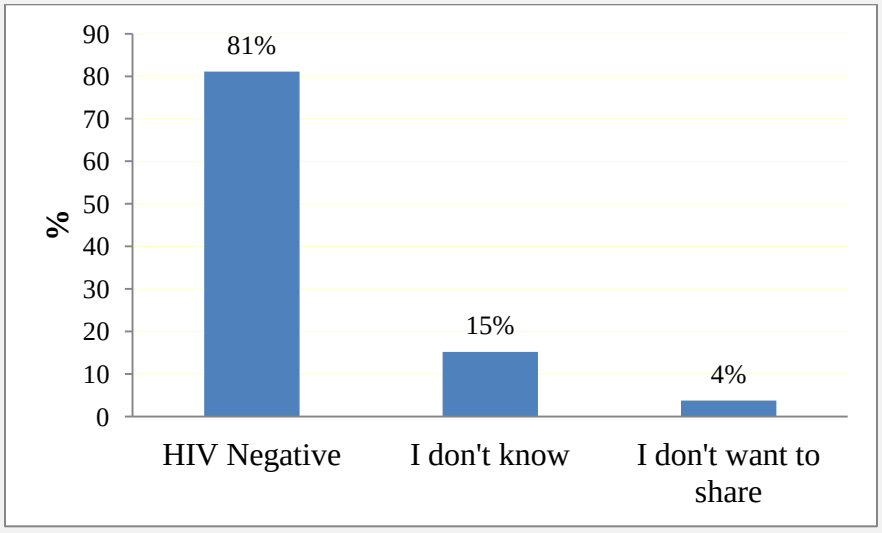

Figure 18. HIV Testing results among Black men aged 18 to 69 years old, DeKalb and Fulton Counties, Georgia, 2012.

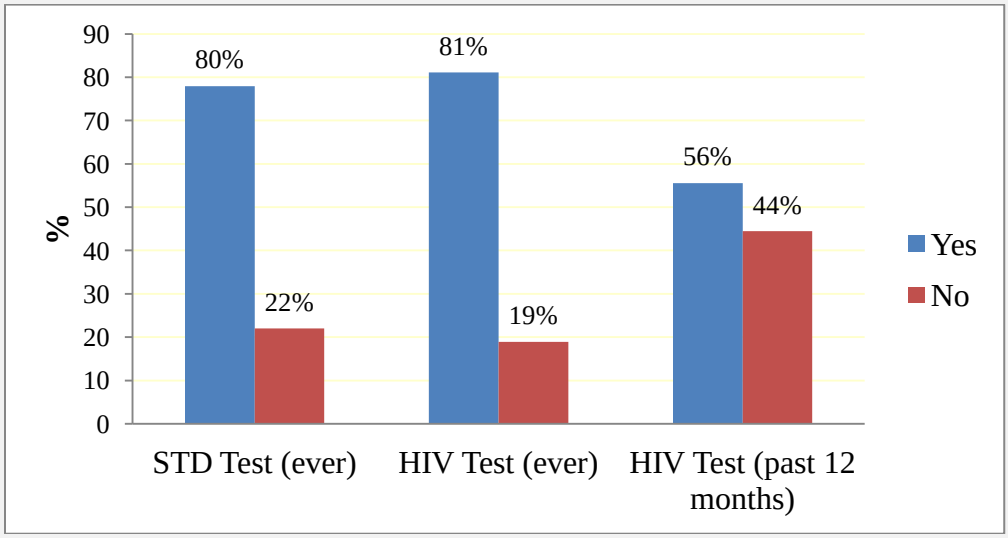

Figure 19. HIV and STI testing history among Black men aged 18 to 69 years old, DeKalb and Fulton Counties, Georgia, 2012.

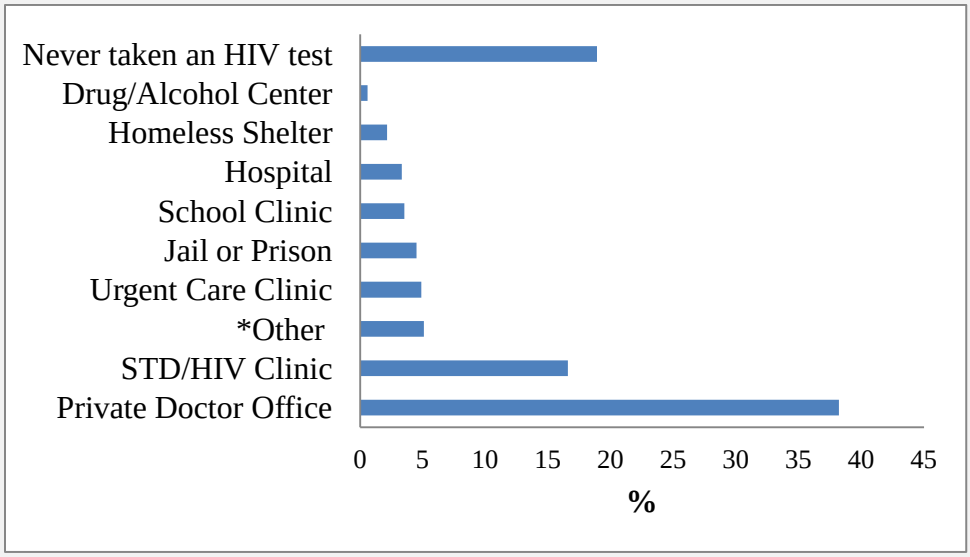

Figure 20. Last HIV testing location among Black men aged 18 to 69 years old, DeKalb and Fulton Counties, Georgia, 2012.

*Other: locations where participants had taken an HIV test included health fairs, military training, life-insurance-policy seminars, a Veterans Hospital, and mobile units.

Access

Of the 513 participants, half (51%) of the Black men owned a vehicle (see Table 20). If the participant did not own a vehicle, the primary means of transportation was public transportation (e.g., bus or subway) or walking (see Table 20). Most participants had health insurance, a regular doctor, and visited a private doctor's office for most of their doctor visits (see Table 20).

Table 20. Access characteristics of 513 Black men, DeKalb and Fulton Counties, Georgia, 2012

Characteristics	*n*	%
Own a vehicle		
Yes	264	51.46
No	249	48.54
Primary Means of Transportation		
Car	233	45.42
Public Transportation	184	35.87
Walk	42	8.19
Bike	10	1.95
Taxi	3	0.58
Ride with friends	41	7.99
Health insurance		
Yes	312	60.82
No	201	39.18
Type of Health Insurance		
Private	233	45.42
Medicaid	26	5.07
Medicare	20	3.90
Public Assistance	33	6.43
No health insurance	201	39.18
Regular Doctor		
Yes	286	55.75
No	227	44.25
Regular Doctor Location		
Private Doctor Office	283	55.17
Emergency Room	107	20.86
Jail/Prison	14	2.73
Urgent Care Clinic	78	15.20
STI Clinic	31	6.04

Main Exposure Variable: Transit Distance

The main exposure variable for this analysis was transit distance (miles) between participant's home address or cross-street and nearest publicly funded free HIV test sites in DeKalb and Fulton Counties, Georgia. This specific aim will examine whether transit distance (miles) is associated with a participant obtaining an HIV test in the past 12 months. To better understand the distribution of transit distance among participants, Figure 21 and Table 21 shows the nearest transit distance distribution between participant's home address and publicly funded free HIV test sites.

Nearest Transit Distance

The median transit distance from participants' home addresses to the nearest publicly funded free HIV test site was 4.4 miles (see Table 21). The median distances were comparable for individuals regardless of HIV testing history. The spread of transit distance was slightly greater among Black men who have taken an HIV test in the past 12 months (*SD* = 5.4 vs. 4.3). The middle 50% of participants' transit distance to the nearest studied HIV test site were similar in both groups (HIV test in the past 12 months vs. No HIV test in the past 12 months), ranging from 0.3 to 21 miles (see Table 21). The distribution of nearest transit distance is not normally distributed and is positively skewed (see Figure 21). Therefore, most of the participants lived closer to a studied HIV test center, whereas a few lived farther away.

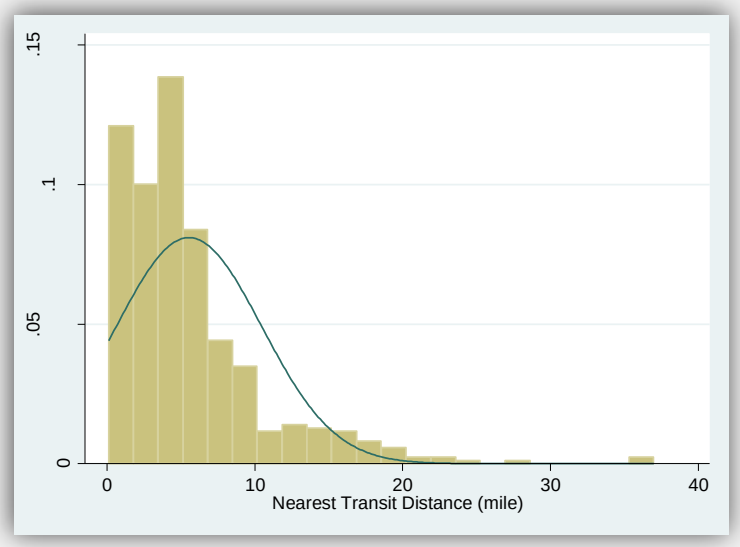

Figure 21. Transit distance between the nearest publicly-funded free HIV test site and participants home address, DeKalb and Fulton Counties, Georgia, 2012.

Table 21. Frequency distribution of transit distance to the nearest publicly-funded free HIV test site among 513 Black men, DeKalb and Fulton Counties, Georgia, 2012

Main exposure	HIV test in the past 12 months	No HIV test in the past 12 months
Nearest transit distance (mile)		
Median	4.4	4.3
Mean	5.8	5.1
Standard Deviation	5.4	4.3
Range	(0.2–37.0)	(0.1–35.5)
Interquartile range	(0.3–21.3)	(0.3–19.7)

Assess Effect Measure Modification (EMM) and Confounding

This section examined the relationship between transit distance and HIV testing in the past 12 months while identifying confounders and effect-measure modification (EMM). A confounder is a variable associated with the outcome and exposure but not an intermediate variable in the causal pathway between the exposure and outcome (Szklo & Nieto, 2007). A

confounder distorts the true association of the main exposure and outcome toward the null of 1 (negative confounding variable) or away from the null of 1 (positive confounding variable). Effect measure modification (EMM) occurs when the effect of a risk factor on an outcome is not homogenous in strata formed by a third variable. Therefore, to assess the true relationship between transit distance and HIV testing in the past 12 months, all confounders and EMM must be identified. This section will provide a manual stepwise process taken to assess the confounding and EMM of the relationship between transit distance (main exposure) and HIV testing in the past 12 months (outcome). This section will provide the findings from each step. The six steps were 1) identify the covariates that are associated with the nearest transit distance, 2) identify the covariates that are associated with HIV testing in the past 12 months, 3) assess whether the covariate associated with transit distance and HIV testing in the past 12 months is an intermediate variable in the causal pathway between transit distance and HIV testing in the past 12 months 4) identify the covariates that are an EMM of the prevalence ratio (PR), 5) identify the covariates that are confounders, and 6) identify the covariates that are independent predictors of HIV testing in the past 12 months & provide a multivariate regression model that includes all identified EMM, confounders and independent predictors.

Bivariate Analysis

Step 1: Identify the covariates associated with the nearest transit distance (main exposure)

In this process, Analysis of Variance (ANOVA) was used to assess the relationship between the covariates and nearest transit distance (main exposure) (see Table 22). The covariates that were found to be statistically significantly ($p<0.05$) associated with transit distance to the nearest publicly-funded free HIV test sites were (a) county of residence, (b) age, (c) employment, (d) monthly salary, (e) STI test (ever), (f) welfare, (g) homelessness, (h) own a

vehicle, (i) means of transportation, (j) regular doctor, (k) location of doctor visit, (l) health insurance, (m) type of health insurance, (n) penitentiary, and (o) drug/alcohol rehabilitation center (see Table 22).

Table 22.Bivariate association between covariates and transit distance to the nearest publicly-funded free HIV test site among 513 Black men, DeKalb and Fulton Counties, Georgia, 2012

	Transit Distance (miles) to the nearest publicly-funded free HIV test center			ANOVA	
Characteristics	Mean distance (miles)	*SD*	*n*	*F*	*p*
County					
DeKalb	5.03	3.69	216	3.91	.05*
Fulton	5.89	5.63	297		
Age					
18–29 yrs	5.27	4.17	237	2.77	.04*
30–39 yrs	5.82	5.27	114		
40–49 yrs	6.52	6.35	98		
50–69 yrs	4.44	4.05	64		
Education					
12th grade or less	4.90	4.79	146		
GED	4.44	3.77	48	2.52	.06
Some college or AA	5.89	4.90	151		
Bachelor or higher	6.06	5.25	168		
Employment					
Employed	6.06	5.34	345	12.12	.00*
Unemployed	4.45	3.70	168		
Monthly Salary					
< $500	4.14	3.37	174	8.15	.00*
$501–$1,000	5.69	5.31	108		
$1,001–$1,500	6.15	5.03	80		
> $1,501	6.68	5.68	151		
HIV test ever					
Yes	5.57	4.98	416	0.17	.68
No	5.35	4.69	97		
STI test ever					
Yes	5.29	4.64	400	4.39	.04*
No	6.37	5.78	113		
HIV test status					
Negative	5.58	4.92	416	0.42	.65
I don’t know	5.53	5.24	78		
I don’t want to share	4.52	3.62	19		

Continued

Characteristics	Transit Distance (miles) to the nearest publicly-funded free HIV test center			ANOVA	
	Mean distance (miles)	*SD*	*n*	*F*	*p*
Welfare					
No	5.82	5.14	439	11.03	.00*
Yes	3.80	2.72	74		
Homeless					
No	5.85	5.01	457	18.21	.00*
Yes	2.90	3.05	56		
Own a Vehicle					
Yes	6.75	5.87	264	35.84	.00*
No	4.24	3.20	249		
Primary Means of Transportation					
Car	6.72	5.55	233	6.22	.00*
Bus	4.81	4.14	184		
Walk	3.10	3.17	42		
Bike	4.09	3.44	10		
Taxi	3.8	2.78	3		
Get rides from friends	4.97	4.57	41		
Regular Doctor					
Yes	6.19	5.44	286	12.05	.00*
No	4.70	4.04	227		
Location of Doctor Visit					
Private Doctor Office	6.31	5.57	283		
Emergency Room	3.98	3.19	107	5.60	.00*
Jail/Prison	3.71	2.69	14		
Urgent Care Clinic	5.64	4.53	78		
STI Clinic	4.21	3.47	31		
Insurance					
Yes	6.13	5.33	312	11.92	.00*
No	4.61	4.05	201		
Type of Insurance					
Private	6.32	5.31	233	6.68	.00*
Other [a]	5.56	5.37	79		
No Health Insurance	4.60	4.05	201		
Arrested					
No	5.76	5.22	296	1.54	.21
Yes	5.22	4.47	217		
Penitentiary					
No	5.79	5.08	457	12.36	.00*
Yes	3.38	2.40	56		
Drug Center					
No	5.75	5.08	449	7.62	.00*
Yes	3.97	3.25	64		
Gender of Sexual Partner/s					
Women	5.78	5.12	402	2.68	.07
Men	4.83	3.92	73		
Women and Men	4.20	4.09	38		

Continued

Characteristics	Transit Distance (miles) to the nearest publicly-funded free HIV test center			ANOVA	
	Mean distance (miles)	*SD*	*n*	*F*	*p*
Construct Items					
Perceived Risk [b]					
Low	5.84	5.06	395	6.28	.01*
Mid-High	4.54	4.31	118		
Attitude toward HIV [a]					
Negative	5.47	4.74	491	13.86	.00*
Positive	4.52	2.99	18		
Undecided	17.9	14.52	4		
HIV Stigma[a]					
Weak Stigma	5.56	4.48	375	2.09	.12
Strong Stigma	5.97	6.57	100		
Undecided	4.07	3.69	38		
Gay Stigma [a]					
Weak Stigma	6.16	5.63	253	4.35	.01*
Strong Stigma	4.76	3.76	141		
Undecided	5.09	4.36	119		

*$p < .05$ = significant; [a] Response range for each item: 1 (strongly disagree) to 5 (strongly agree); [b] Response range for each item: 0 (no chance) 1 (very unlikely) to 4 (very likely); [a] Other: Medicaid, Medicare, Public Assistance.

Step 2: Identify the covariates associated with HIV testing in the past 12 months (outcome)

To continue identifying the covariates that serve as potential confounders, chi-square analysis was used to examine the association between the covariates and HIV testing in the past 12 months (see Table 23). Covariates that were found to be statistically significantly ($p<0.05$) associated with HIV testing in the past 12 months were: (a) county, (b) education, (c) employment, (d) monthly salary, (e) HIV test ever, (f) STI test ever, (g) HIV test status, (h) welfare, (i) own a vehicle, (j) primary means of transportation, (k) regular doctor, (l) location of doctor visit, (m) type of health insurance, (n) gender of sexual partner/s, (o) perceived risk of HIV, (p) HIV stigma, and (q) "Gay" stigma (see Table 23).

Table 23. Bivariate association between covariates and HIV testing in the past 12 months among 513 Black men, DeKalb and Fulton Counties, Georgia, 2012

	HIV Test in the past 12 mo.		No HIV test in the past 12 mo.		
	n	%	*n*	%	X^2 *p*-value
County					
DeKalb	98	34	118	52	.00*
Fulton	187	66	110	48	
Age					
18–29 yrs	136	48	101	44	
30–39 yrs	67	24	47	21	.08
40–49 yrs	56	19	42	19	
50–69 yrs	26	9	38	17	
Education					
12th grade or less	69	24	77	34	
GED	20	7	28	12	
Some college or AA	86	30	65	29	.00*
Bachelor or higher	110	39	58	25	
Employment					
Employed	214	76	131	55	.00*
Unemployed	71	24	97	45	
Monthly Salary					
< $500	88	31	86	38	
$501–$1,000	63	22	45	20	.04*
$1,001–$1,500	38	13	42	18	
> $1,501	96	34	55	24	
HIV test ever					
Yes	285	285	131	131	.00*
No	0	0	97	97	
STI test ever	264	93	136	60	
Yes	21	7	92	40	.00*
No	264	93	136	60	
HIV test status					
Negative	271	96	145	64	
I don’t know	7	2	71	31	.00*
I don’t want to share	7	2	12	5	

Continued

	HIV test in the past 12 mo.		No HIV test in 12 mo.		
	n	%	*N*	%	X^2 *p*-value
Welfare					
No	259	91	180	79	.00*
Yes	26	9	48	21	
Homeless					
No	258	91	199	87	.24
Yes	27	9	29	13	
Own a Vehicle					
Yes	163	57	101	44	.00*
No	122	43	127	56	
Primary Means of Transportation					
Car	149	52	84	37	
Bus	94	33	90	39	
Walk	18	6	24	11	
Bike	4	2	6	3	.01*
Taxi	2	1	1	0	
Get rides from friends	18	6	23	10	
Regular Doctor					
Yes	181	64	105	46	.00*
No	104	36	123	54	
Location of Doctor Visit					
Private Doctor Office	172	60	111	49	
Emergency Room	48	17	59	26	
Jail/Prison	8	3	6	3	.02*
Urgent Care Clinic	37	13	41	18	
STI Clinic	20	7	11	4	
Insurance					
Yes	183	64	129	57	.08
No	102	36	99	43	
Type of Insurance					
Private	152	53	81	36	
Other [a]	31	11	48	21	.00*
No Health Insurance	102	36	99	43	
Arrested					
No	160	56	136	60	.42
Yes	125	44	92	40	
Penitentiary					
No	250	88	207	91	.27
Yes	35	12	21	9	

Continued

	HIV test in the past 12 mo.		No HIV test in 12 mo.		
	n	%	*N*	%	X^2 *p*-value
Drug Center					
No	244	86	205	90	.14
Yes	41	14	23	10	
Gender of sexual partner/s					
Women	204	72	198	86	
Men	58	20	15	7	.00*
Women & Men	23	8	15	7	
Construct Items					
Perceived Risk [b]					
Low	236	83	159	70	.00*
Mid-High	49	17	69	30	
Attitude towards HIV [a]					
Negative	268	94	223	98	
Positive	13	5	5	2	.07
Undecided	4	1	0	0	
HIV Stigma [a]					
Weak Stigma	221	77	154	67	.03*
Strong Stigma	48	17	52	23	
Undecided	16	6	22	10	
Gay Stigma [a]					
Weak Stigma	155	54	98	43	
Strong Stigma	71	25	70	31	.04*
Undecided	59	21	60	26	

*$p < .05$ = significant; [a] Response range for each item: 1 (strongly disagree) to 5 (strongly agree); [b] Response range for each item: 0 (no chance), 1 (very unlikely), to 4 (very likely); [a] Other: Medicaid, Medicare, Public Assistance.

Step 3: Assess whether the covariate associated with transit distance and HIV testing in the past 12 months is an intermediate variable in the causal pathway between transit distance and HIV testing in the past 12 months

All covariates associated with transit distance (main exposure) and HIV testing in the past 12 months (outcome) were found to not serve as an intermediate variable in the causal pathway between the main exposure and outcome relationship. Therefore, all covariates associated with transit distance (main exposure) and HIV testing in the past 12 months (outcome)

and not an intermediate variable in the causal pathway were identified as "potential confounders." Table 24 provides an outline of identified potential confounders.

Table 24. Covariates associated with transit distance and HIV testing in the past 12 months.

Potential Confounders [a]
County
Monthly Salary
Own a vehicle
Primary Means of Transportation
Regular Doctor
Location of doctor visit
Type of Insurance
Gay Stigma
Perceived Risk
Employment
STI test ever

[a] Statistically significantly ($p < .05$) associated with transit distance and HIV testing in the past 12 months.

Step 4: Identify the covariates that are an EMM of the prevalence ratio

Effect measure modification (EMM) is when the effect of a risk factor on an outcome is not homogenous in strata formed by a third variable (Szklo & Nieto, 2007). To assess the EMM of the prevalence ratio, all potential confounders were stratified by each level and stratum-specific prevalence ratios for the association between the transit distance and HIV testing in the past 12 months and examined for homogeneity. By examining the stratified specific prevalence ratio and the Breslow-Day test of $p < 0.20$ as significant, it was found that the null hypothesis of estimates being homogeneous across all covariates was rejected ($p < 0.20$) for regular doctor. Due to no substantial difference within the stratum PR for regular doctor, the interaction between transit distance and regular doctor will be assessed as an EMM later in the analysis in the multivariate regression model. There were qualitative interactions for monthly salary, primary

means of transportation, regular doctor visit, location of doctor visits, type of health insurance, perceived risk, and gay stigma (see Table 25); however, qualitative interactions were not statistically significant (p>0.20).

Table 25. The effect of transit distance (miles) to the nearest publicly funded free HIV test site on HIV testing in the past 12 months stratified by levels of the covariates.

Covariates	Nearest Transit Distance Stratified PR (95%CI)	B-D	Sample Size
County			
DeKalb	0.97 (0.94-1.01)	0.82	216
Fulton	1.02 (1.00- 1.02)		297
Age			
18-29 yrs	1.01 (0.99-1.03)		237
30-39 yrs	1.02 (1.00- 1.03)	0.73	114
40-49 yrs	1.01 (0.99-1.02)		98
50-69 yrs	0.96 (0.90- 1.02)		64
Employment			
Employed	1.01 (1.00-1.03)	0.52	345
Unemployed	0.96 (0.91-1.00)		168
Monthly Salary			
< $500	0.99 (0.96-1.03)		174
$501-$1,000	1.01 (0.99-1.03)	0.85	108
$1,001-$1,500	0.99 (0.97-1.02)		80
>= $1,501	1.01 (0.99-1.03)		151
STI test (ever)			
Yes	1.03	0.92	400
No	0.89		113
Welfare			
No	1.01 (0.99-1.02)	0.46	439
Yes	0.94 (0.86-1.02)		74
Own a Vehicle			
Yes	1.01 (1.00- 1.03)	0.99	264
No	0.98 (0.95-1.02)		249
Primary Means of Transportation			
Car	1.01 (1.00-1.03)		233
Bus	0.99 (0.96-1.02)	0.39	184
Walk	0.94 (0.85-1.12)		42
Bike	0.99 (0.87-1.12)		10
Get rides from others	0.99 (0.95-1.04)		44
Regular Doctor			
Yes	1.01 (1.00-1.03)	0.09*	286
No	0.99 (0.96- 1.02)		227

Location of Doctor Visit			
Private Doctor Office	1.01 (1.00-1.03)		283
ER/Urgent Care	0.98 (0.96-1.02)	0.56	185
Other (STI Clinic, jail)	1.01 (0.96-1.06)		45
Type of Insurance			
Private	1.02 (1.00-1.03)		233
Other (Medicaid, Medicare, Public Assistance)	0.98 (0.95-1.03)	0.76	79
No health insurance	0.99 (0.97-1.02)		201
Perceived Risk			
Low	1.01 (1.00-1.02)	0.73	395
Mid-High	0.96 (0.92-1.01)		118
Gay Stigma			
Weak Stigma	1.01 (1.00-1.02)		253
Strong Stigma	0.99 (0.97-1.03)	0.63	141
Undecided	1.01 (0.96-1.02)		119

[a] Breslow-Day Test of homogeneity: *p*-value < .20 = Effect Measure Modifier of the PR.

Step 5: Identify the covariates that are confounders

Crude Prevalence Ratio: Transit Distance and HIV testing in the past 12 months

The association of transit distance to publicly-funded free HIV test sites and HIV testing in the past 12 months was examined by determining the crude prevalence ratio. When assessing the relationship of nearest transit distance and HIV testing in the past 12 months, results showed that for every one mile increase in transit distance from a publicly-funded free HIV test site, Black men were 1% more likely to have an HIV test in the past 12 months (Unadjusted PR: 1.01 95% CI: 0.99–1.03; see Table 26). The crude prevalence ratio was not statistically significant at a significance level of less than 5% (p = .08).

Crude versus Adjusted Prevalence Ratio: Transit Distance and HIV testing in the past 12 months adjusted for each potential confounders

Table 26 shows the results after using Poisson Robust Regression to identify the prevalence ratio on the effect of transit distance on HIV testing in the past 12 months after adjusting for each potential confounder one at a time (adjusted prevalence ratio). After conducting the analysis, it was found that there were no covariates confounding the relationship

between transit distance and HIV testing in the past 12 months based on the 10% rule of difference between the unadjusted prevalence ratio and adjusted prevalence ratio (see Table 26).

Table 26. The effect of transit distance to publicly funded free HIV test sites on HIV testing in the past 12 months adjusted for potential confounders using Poisson Robust Regression

	PR	95% CI	Difference*
Crude Prevalence Ratio	**1.01**	**0.99–1.03**	—
Adjusted for:			
County	1.01	0.99–1.02	0.00
Employment	1.01	0.99–1.02	0.00
Monthly Salary	1.01	0.99–1.02	0.00
STI test ever	1.02	1.00–1.03	0.01
Own a vehicle	1.01	0.99–1.02	0.00
Primary means of transportation	1.01	0.99–1.02	0.00
Regular Doctor	1.01	0.99–1.02	0.00
Location of Doctor Visit	1.01	0.99–1.02	0.00
Type of Health Insurance	1.01	0.99–1.02	0.00
Perceived Risk	1.01	0.99–1.02	0.00
Gay Stigma	1.01	0.99–1.02	0.00

*10% Difference is used to determine confounding = ln (unadjusted PR/adjusted PR)

Multivariate Analysis

Step 6: Identify the covariates that are independent predictors of HIV testing in the past 12 months & provide a multivariate regression model that includes all identified EMM, confounders and independent predictors

To develop the multivariate regression model, highly-correlated covariates ($r > .65$) from the Spearman Correlation analysis were not included in the model. Highly-correlated covariates were: primary means of transportation and own a vehicle ($r = .84$), monthly salary and employment ($r = .83$), and type of insurance and location of regular doctor visits ($r = .62$).

Therefore, primary means of transportation, monthly salary, and location of regular doctor visits were not added into the model due to co-linearity. All covariates found to be statistically significantly associated with transit distance and HIV testing in the past 12 months and EMM (regular doctor) were included in the full multivariate regression model (see Equation 6).

Equation 6. Full Multivariate Regression Model

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g (HIV testing in the past 12 months) = –0.41 + 0.01 (transit distance) + 0.23 (county) - 0.14 (employment) – 1.20 (STI test) - 0.04 (own a vehicle) – 0.29 (regular doctor) – 0.26 (health insurance: other) + 0.07 (no health insurance) – 0.19 (perceived risk) – 0.07 (gay stigma: weak) – 0.04 (gay stigma: undecided) +0.01 (transit distance * regular doctor)

Effect Measure Modification (EMM) of the Prevalence Ratio

After adding the covariates and interaction (transit distance * regular doctor) to the full multivariate model, there were no covariates that confounded the relationship between transit distance and HIV testing in the past 12 months based on the 10% difference between the unadjusted prevalence ratio and adjusted prevalence ratio (Unadjusted PR: 1.01, Adjusted PR: 1.00). When the interaction term (transit distance * regular doctor) was added to the multivariate regression model, the interaction term was not statistically significant ($p > 0.20$). Therefore, when adding the interaction term regular doctor*transit distance to the model with other factors the statistical significance was lost. Consequently, the interaction term (transit distance * regular doctor) was removed from the regression model and was not identified as an EMM.

Confounders

Previously in step 5, no covariates were identified as confounders of the relationship between transit distance and HIV testing in the past 12 months based on < 10% change between the

unadjusted and adjusted prevalence ratios. Although, these covariates were not identified as confounders, the next step was to identify which covariates were independent predictors of HIV testing in the past 12 months.

Independent Predictors

This step identified the independent predictors of HIV testing in the past 12 months. All covariates that were associated with transit distance and HIV testing in the past 12 months were added to the multivariate regression model to identify independent predictors. The covariates that were not significant ($p > .05$) were not identified as independent predictors and were removed from the full model. All statistically significant covariates ($p<0.05$) remained in the multivariate regression model and were identified as independent predictors of HIV testing in the past 12 months (see Equation 7 and Table 27). The covariates identified as independent predictors were: county of residence, ever having an STI test, having a regular doctor and type of health insurance (see Equation 7 and Table 27). The final multivariate regression model fit the data well ($X^2 = 0.44$, $p = 0.55$).

Equation 7. Reduced Final Multivariate Regression Model

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g (HIV testing in the past 12 months) = - 0.51 + 0.01 (transit distance) + 0.24 (county) – 1.24 (STI test-ever) – 0.24 (regular doctor) – 0.35 (health insurance: other) + 0.02 (no health insurance)

Table 27. Multivariate analysis of the association between transit distance and HIV testing in the past 12 months using Poisson Robust Regression

	HIV Test in the past 12 months *N* = 285	No HIV Test in the past 12 months *N* = 228	APR	95% CI	*p*-value
Main Exposure					
Transit Distance (continuous)	285	228	1.01	1.00–1.02	0.04*
Independent Predictors					
County					
DeKalb	98	118	ref		
Fulton	187	110	1.27	1.07–1.49	0.00*
STI Test (ever)					
Yes	264	136	ref		
No	21	92	0.29	0.19–0.43	0.00*
Regular Doctor					
Yes	181	105	ref		
No	104	123	0.77	0.65–0.92	0.00*
Type of Insurance					
Private	152	81	ref		
Other [a]	31	48	0.70	0.51–0.91	0.00*
No Insurance	102	99	1.02	0.86–1.23	0.76

[a] Medicaid, Medicare, Public Assistance; *Statistically Significant at $p < .05$.
Pearson's Chi-Square Goodness of fit test (p = 0.44)

Finding

After conducting a Poisson robust multivariate regression analysis, there was statistically significant evidence that showed when county, STI test, regular doctor, and type of health insurance remain constant, for every one mile increase in transit distance from a publicly-funded free HIV test site, Black men were 1% more likely to have an HIV test in the past 12 months (Adjusted PR: 1.01 95% CI: 1.00–1.02). Black men that lived in Fulton County were 27% more

likely to have an HIV test in the past 12 months than Black men living in DeKalb County. Black men without a regular doctor were 23% less likely to have an HIV test in the past 12 months than Black men with a regular doctor. Black men that reported not having a STI test at least once in their lifetime were 71% less likely to have an HIV test in the past 12 months than Black men who have taken a STI test at least once. Black men who received Medicaid, Medicare or Public Assistance were 30% less likely to have obtained an HIV test in the past 12 months than Black men receiving private health insurance.

A random effect ANOVA multi-level analysis was used to determine what portion of the variance in HIV testing in the past 12 months was due to cross-county (DeKalb & Fulton Co.) differences as compared to individual differences. The likelihood (LR) ratio test statistic was used to test the null hypothesis that there is no cross-county variation in HIV testing on the past 12 months. The null hypothesis was rejected due to statistically significant evidence showing no cross-county variation between DeKalb and Fulton Counties on HIV testing in the past 12 months ($p < 0.05$).

In conclusion, there is statistically significant evidence that showed a 1% association between transit distance and HIV testing in the past 12 months. There is also statistically significant evidence that found living in DeKalb County, never having an STI test, not having a regular doctor, and not having private health insurance served as independent predictors for not receiving an HIV test in the past 12 months among this study population of Black men.

Phase III: Qualitative Study

Abstract

Objective: Identify factors that influence adult (18 years and older) Black men's decision to seek or not seek HIV testing. **Design:** Phase III is a qualitative study that used in-depth face-to-face

interviews among 26 Black men. **Recruitment:** Active street recruitment at various venues such as gyms, parks, barber shops, and bus stops and snow-ball sampling methods were used to identify and recruit Black men that currently reside in DeKalb and Fulton Counties, Georgia for the study.

Qualitative Study—Face-to-Face Interviews

This qualitative study provided an additional opportunity to research the underlying motivations that influence Black men in their decision-making process to obtain an HIV test. In Phase III, a new group of Black men (n = 26) was identified and selected from the DeKalb and Fulton Counties of Georgia, to participate in this qualitative study. The data-collection method used for this qualitative study was in-depth, semi-structured, one-on-one interviews. The interviewer was the study investigator (female interviewer) and research assistant (male interviewer) who in total administered 26 face-to-face, audio-recorded interviews. This section will provide further clarification of the reasons that affect Black men's decision to seek HIV testing.

Of Black men interviewed who had not obtained an HIV test in the past 12 months (n = 13), 62% lived in Fulton County, 85% obtained less than a Bachelor degree, 85% used public transportation or personal vehicle (15%) as their primary means of transportation, 55% did not have health insurance, and 77% reported only having sex with men (see Table 28).

Of Black men interviewed who had obtained an HIV test in the past 12 months (n = 13), 54% lived in Fulton County, 100% obtained less than a Bachelor degree, 92% used public transportation or walking as their primary means of transportation, 40% did not have health insurance, 61% reported only having sex with men, and 62% never had an HIV test in their lifetime (see Table 28).

Table 28. Distribution of demographics among 26 Black men by HIV testing in the past 12 months, DeKalb and Fulton Counties, Georgia, 2012.

Characteristics	HIV test in the past 12 mo. n =13		No HIV test in the past 12 mo. n = 13	
	Mean	SD*	Mean	SD*
Age (years)	31	9.67	28	8.62
	n	%	n	%
Education				
12th	3	23.08	5	38.46
GED	4	30.77	2	15.38
Some College/AA	4	30.77	6	46.15
Bachelor or higher	2	15.38	0	0.00
Current County of Residence				
DeKalb	5	38.46	6	46.15
Fulton	8	61.54	7	53.83
Primary means of transportation				
Car	2	15.38	1	7.69
Bus/Marta	11	84.62	7	53.85
Walk	0	0	5	38.46
Health Insurance				
No	6	54.55	6	40.00
Yes	5	45.45	9	60.00
Type of Health Insurance				
Private	1	11.11	3	23.08
Medicaid	1	11.11	1	7.69
Medicare	1	11.11	2	15.38
Public Assistance	1	11.11	3	23.08
No Health Insurance	5	55.56	4	30.77
Arrested				
No	6	46.15	7	53.85
Yes	7	53.15	6	46.15
Served in a penitentiary				
No	12	92.31	13	100.00
Yes	1	7.69	0	0

*SD = Standard Deviation

Continued

Characteristics	HIV test in the past 12 mo. n =13		No HIV test in the past 12 mo. n = 13	
	n	%	n	%
I have sex with ….				
Women	2	15.38	3	23.08
Men	10	76.92	8	61.45
Women and Men	1	7.65	2	15.38
Ever had an HIV test				
No	0	0.0	2	38.28
Yes	13	100.00	11	61.72
HIV Status				
Negative	11	84.62	8	7.69
Positive	1	7.69	2	15.38
I do not know	1	7.69	2	15.38
I do not want to share	0	0.00	1	7.69

Barriers to Obtaining an HIV Test

Barriers. Participants were asked to identify reasons that influenced them to not get an HIV test. These reasons were identified as *Barriers*. Participants identified 14 barriers: (a) access to HIV test center, (b) privacy concerns, (c) pride, (d) peer pressure, (e) low perceived risk of HIV, (f) lack of caring, (g) judgment, (h) high perceived risk, (i) "Gay Man" test stigma, (j) fear, (k) do not want to know, (l) do not love self, (m) cost of the test, and (n) too busy (see Figure 22). Of the 14 barriers, four were identified as *Major Barriers* due to majority of the participants consistently identifying this category as a reason they may not seek an HIV test. The four major barriers were: (a) fear, (b) "Gay Man" test stigma, (c) judgment, and (d) privacy concerns.

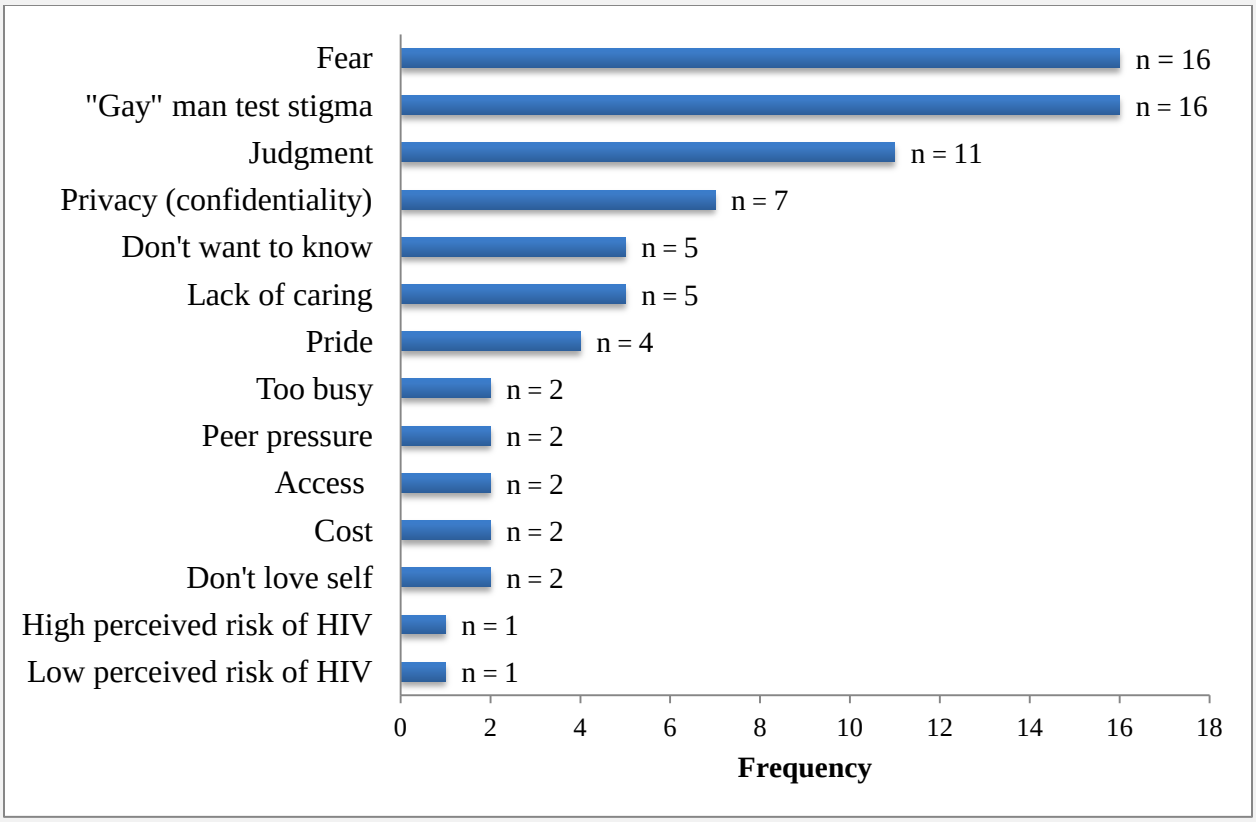

Figure 22. Barriers to getting an HIV test among 26 Black men, DeKalb and Fulton Counties, Georgia, 2012. (Participants were allowed to identify multiple barriers).

Fear. Fear was a major reason why Black men were not tested for HIV. They expressed the fear of being positive and having to deal with the reality of knowing they are positive; telling their sexual partner they are positive, and people finding out they are HIV- positive. During the interviews, it was mentioned that fear is a common feeling among Black men.

> *Fear is the most common feeling traveling through a Black man. Because the odds are that he has it [HIV]*. (Participant 21)

> *We [Black men] are blessed and cursed. We're blessed in the aspect of we're strong, there's a lot expected of us, we can achieve a lot. However, there's a lot of negative stigma on us as Black men that we don't want to live up to. This negativity makes us live in fear of becoming that negative stigma, but we also use it [negative stigma] as power. We just have to realize the power is all ours.* (Participant 6)

Many of the participants did not want to face the possibility of the HIV test results being positive. This feeling of "fear" overpowered the need to get tested if they felt there was no reason without visible signs or symptoms.

HIV test is nothing short of a reality check. (Participant 26)

Honestly, something that would keep me from getting an HIV test is knowing in my heart that something positive may come back and delaying the inevitable. (Participant 14)

I'm scared to know (Participant 3)

Why face it? If it's not bothering me, I'm not going to bother it. (Participant 23)

Gay man test. During the interview, majority of participants felt that men who have sex with men, which they referred to as "Gay," needed to take the test rather than men who have sex with only women, which was referred to as "Straight." Many participants had negative feelings toward the sexual act of men having sex with men or men having sex with men and women.

It's nasty. That's one disease that gay men have. They bring that stuff. (Participant 24)

Men who have sex with man and woman is definitely a reckless lifestyle. (Participant 23)

Men who have sex with men are freaks. They are freaks. Pardon me. They're freaks. (Participant 9)

Many participants felt that homosexual men were seeking an HIV test more than anyone else. When asked who they thought were getting an HIV test—Gay men or Straight men—the majority of participants said "Gay men."

I think homosexuals are getting an HIV test. You know when I go get an HIV test; I've seen more gays and transvestites in the clinic so I would say they are the ones getting it. (Participant 7)

If I get tested, folks are going to think that automatically either I'm gay even if I'm not or I have a reckless behavior. (Participant 16)

Judgment. Judgment from family, friends, clinic staff, and bystanders was a major concern for participants in not getting an HIV test. Many men felt that bystanders would judge or talk about them going into an HIV or STI clinic, clinic staff would talk about them asking for the test, and family/friends would judge them if they were HIV- positive. The feeling of abandonment from friends and family if HIV- positive was mentioned and the gossip and rumors of "nosey" neighbors were identified as reasons for not getting an HIV test.

It's [HIV] like a death sentence, like people would treat me like I'm a leper from the Bible. (Participant 3)

Because everybody in the community, like EVERYBODY in the community, once that information got out, everybody is going to turn away from me and my family. (Participant 20)

I might run into someone up in the clinic and I wouldn't want them running back to my neighborhood spreading some stuff about me. (Participant 6)

You go into a clinic that specializes in HIV or STD, you know everybody when you walk out the door already know you business. (Participant 9)

Privacy/confidentiality. Many participants expressed concerns about test results not remaining private. They felt going into an STI or HIV clinic was a "red flag" that a person was either getting an STI test or HIV test; therefore, felt that people already knew too much of their private life. Many participants felt the professionalism of keeping their records private would be better in a private physician's office than a health department or public clinic.

They are rude. Clinics hire ghetto people, and when you hire ghetto people you'll have a ghetto function. They might mix up my paperwork with somebody else's paperwork. (Participant 22)

I'm glad that so far, you know, I have healthcare. I can go to my own private practice and get checked out in private and not worry about somebody speculating something about me. (Participant 9)

I don't want nobody seeing me walking up in a STD and HIV clinic because the first thing they're going to calling everyone saying "I knew, I knew something was going on." (Participant 11)

I worry about the confidentiality you know, cause rumors can spread, really, really easily. (Participant 3)

My information will be posted publicly (Participant 10)

Throughout many interviews, participants expressed the lack of privacy or confidentiality when going to take an HIV test. Many believed individuals would judge them as they would enter an HIV or STI clinic. Due to the frequent placement of STI and HIV clinics within low-income neighborhoods with high rates of HIV, it was important to understand if Black men would obtain an HIV test from a clinic within or outside their neighborhood (see Figure 23).

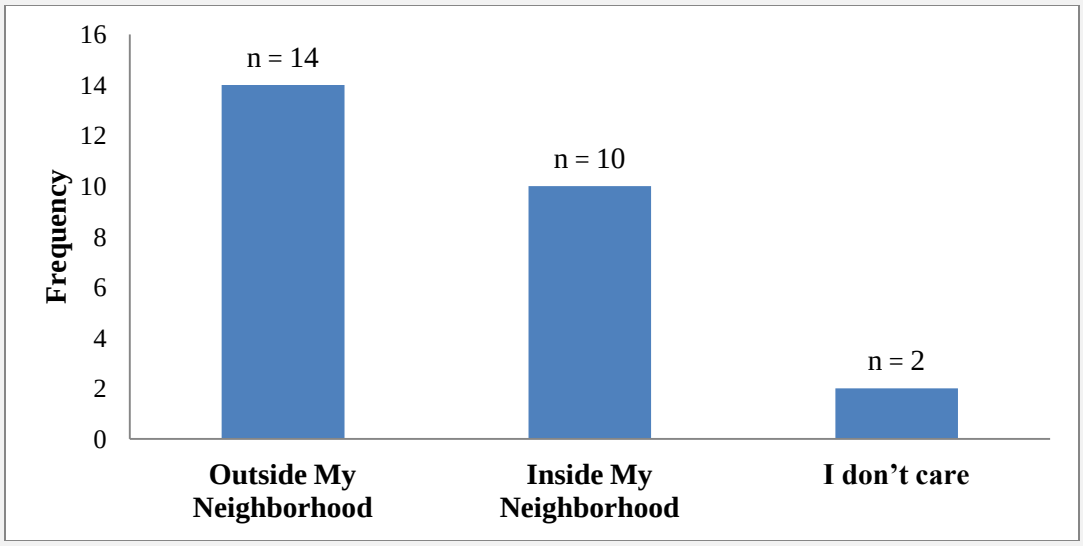

Figure 23. Would you rather go to a clinic in or outside your neighborhood to get an HIV test?

More than half of participants reported wanting to go outside of the neighborhood (*n* = 14) due to issues of privacy. The threat of seeing someone in the clinic or having someone see them walk in the clinic was too great of a risk, if getting an HIV test from a clinic in their neighborhood. Many feared the possibility of knowing the staff members of the clinic, and their sexual life becoming the "face" of neighborhood gossip.

> *Outside, because it's supposed to be confidential. It ain't confidential if your're sitting around with people you live around* (Participant 26)
>
> *When you are trying to do something secretively and you do not want folks to know your business, you definitely won't go to your neighborhood because folks have seen your face and passing you when you go to the store, when you go to work, wherever you are going, they've seen your face. So, if they see you going into this particular building which everybody knows what it is, then they're like, "Oh okay."* (Participant 16)
>
> *Outside, because they're going to be more and more rumors.* (Participant 20)

Although more than half reported wanting to take an HIV test at a clinic outside their neighborhood, 10 participants (38%) stated they would rather take an HIV test in their

neighborhood and two participants did not care where they took the test. The main reasons for wanting to stay in their neighborhood were related to access and being able to get to the clinic easily. The majority (81%) of participants used public transportation or walking as their primary means of transportation (see Figure 24). Therefore, having the ability to easily access a facility in the neighborhood was important.

> *In my neighborhood, because it's nearer, why go further when there's already one right here.* (Participant 25)
>
> *Close to me, because it's you know easy access.* (Participant 19)

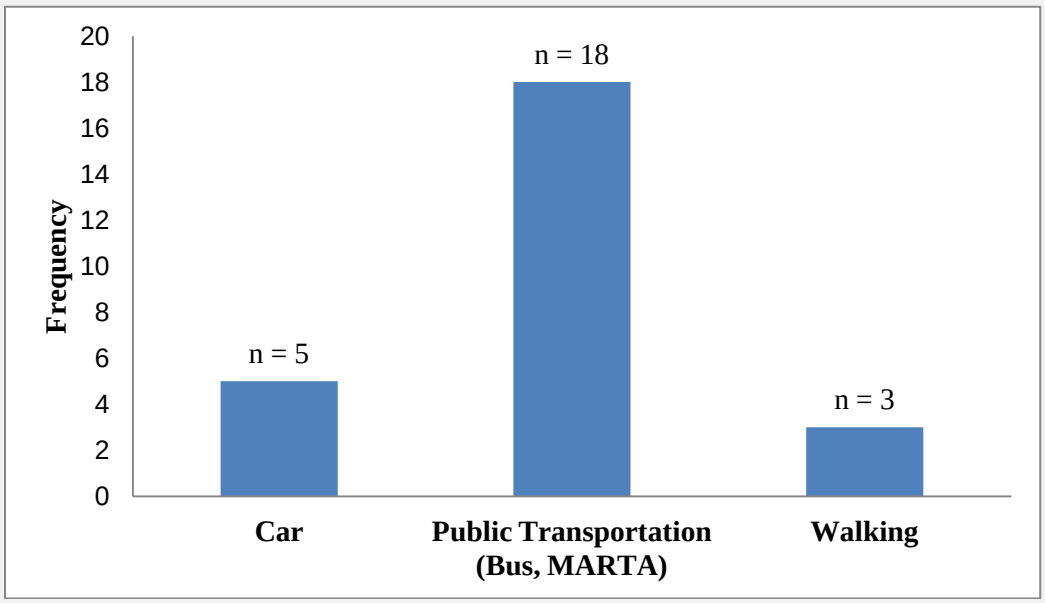

Figure 24. What is your primary means of transportation?

Many participants identified a public clinic, free clinic and public health department as locations they would feel most uncomfortable receiving an HIV test (See Figure 25). Reasons behind these feelings were based on seeing someone they knew and lack of trust in personnel. Some participants felt public health clinics have many people in the waiting area and that would serve as a barrier for them to sit and wait with the possibility of seeing someone they know in the waiting room.

I would probably say at a large clinic with a large waiting room. You know with a lot of people in the waiting room. I guess because you know it's about—if it's a lot of people then, I would feel like you know I'm—I would feel a little paranoid you know with a lot of people around me. (Participant 7).

I wouldn't want to go to a health department clinic. The ones over here are just straight edge, it is ghetto, and the staff is just rude. They just hire a lot of ghetto people, and when that happens you will have a ghetto function. When I got tested at XXXX Clinic, they mixed up my paperwork with someone else. (Participant 21).

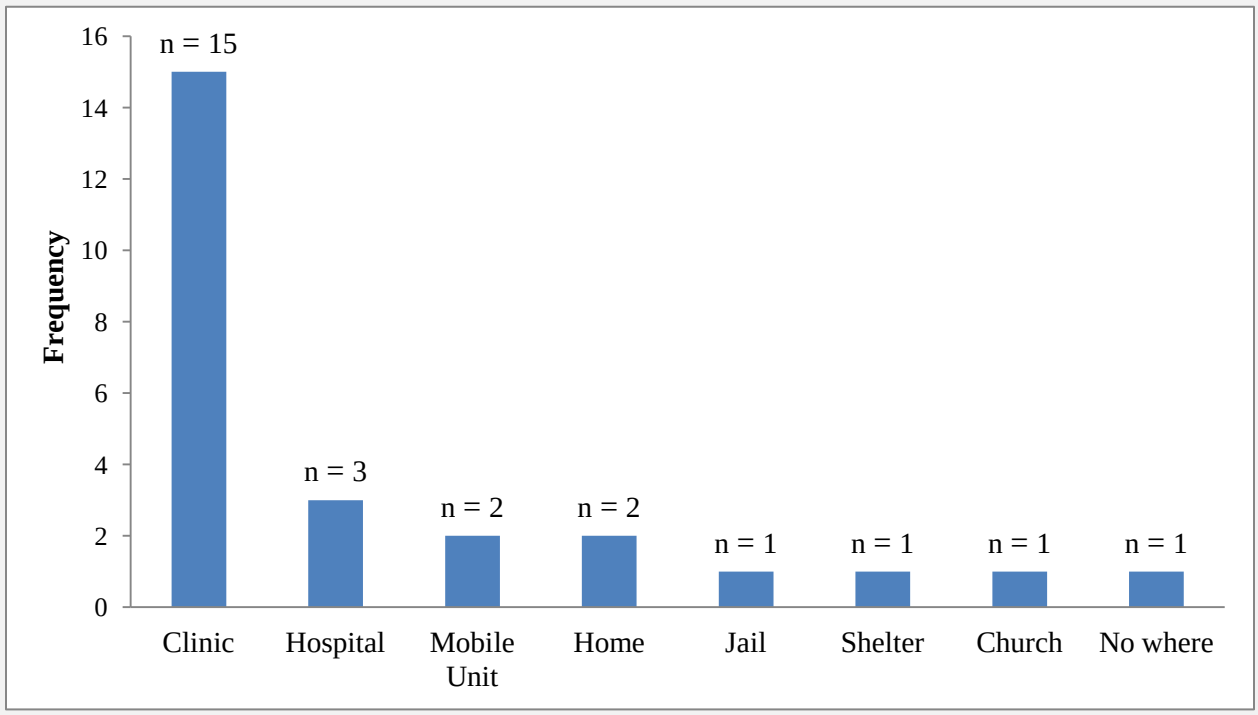

Figure 25. Where would you feel most uncomfortable receiving an HIV test?

Facilitators to Obtaining an HIV Test

Facilitators. Participants were asked what prompted them to take an HIV test. Participants who never took an HIV test were asked what factors would encourage them to take an HIV test. These reasons were combined and identified as *Facilitators*. Participants identified 13 facilitators: (a) women, (b) symptoms of an illness, (c) support (peers and family), (d) sexually transmitted infection (STI) history, (e) regular HIV testing, (f) sexual partner at risk, (g) educated about HIV and AIDS, (h) knowing my HIV status, (i) having HIV-positive friends, (j) high perceived risk of HIV, (k) free HIV test, (l) children, and (m) asked by their doctor (see Figure 26). These facilitators are factors participants identified as reasons they received an HIV test and reasons they would get an HIV test. Of the 13 themes, four were identified as *Major Facilitators* due to many participants consistently identifying this category as a reason to get an HIV test. The four major facilitators were: (a) high perceived risk of HIV, (b) partner at risk for HIV, (c) support from peers/family, and (d) women (see Figure 26).

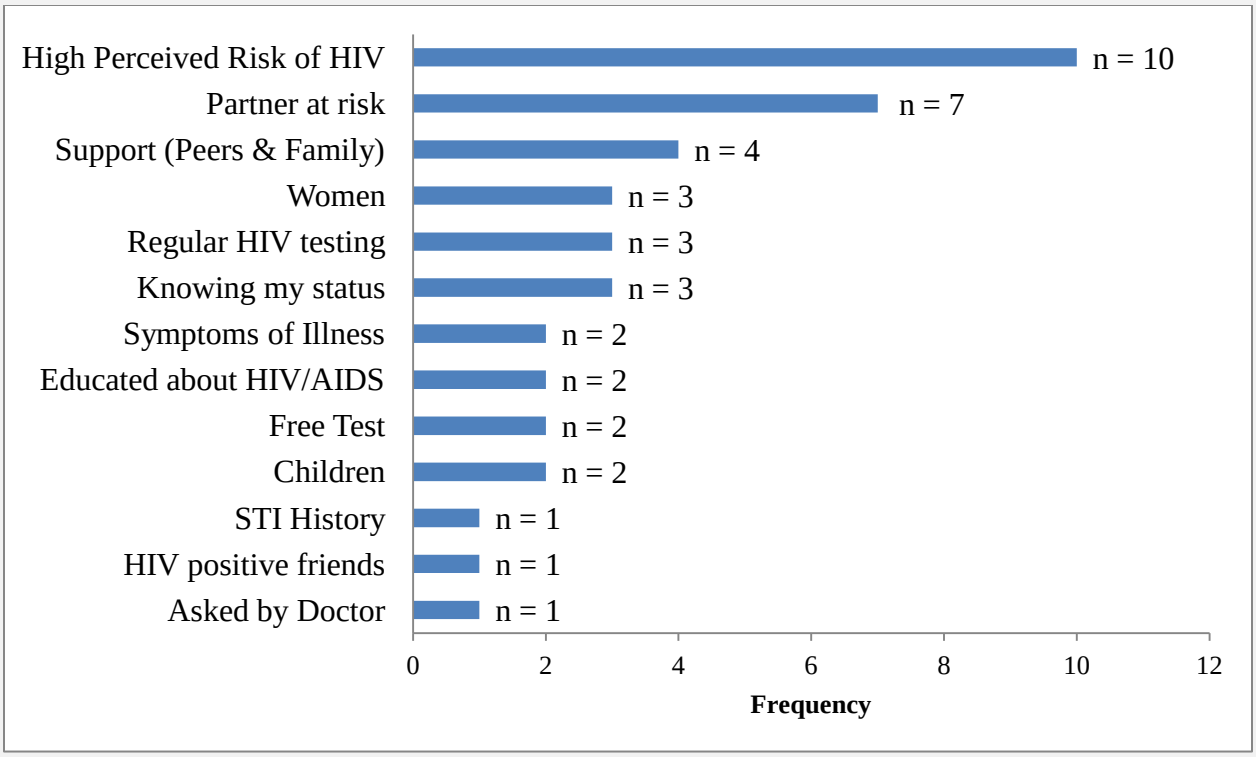

Figure 26. Facilitators to getting an HIV test among 26 Black men in DeKalb and Fulton Counties, Georgia, 2012 (Participants were allowed to identify multiple facilitator).

High perceived risk. Many participants expressed that having unprotected sex with multiple partners made them get an HIV test. The majority of participants reported that Black men are more promiscuous now than ever. When asked to elaborate on what the term "promiscuity" meant, many would say a man that is sleeping with everyone—men or women—and not protecting himself. They would go on to explain that a man who is promiscuous does not care; he is reckless sexually because he is sleeping with everyone.

> *Black males are probably a bit more sexually active and how with the whole down low thing going on I've probably slept with girls who have been with a whole bunch of males. You just never know, everybody's sleeping with everybody now-a-days.* (Participant 1)

> *My turnaround point was that I am her at the turn of my 30s, working at different locations, seeing [having sex with] different people, getting sick and you, I had been*

rolling around and you know not always protecting myself. So hey, I went down and got tested. (Participant 9)

Many participants felt that a man would automatically get tested if he knows he is having unprotected sex with multiple partners and felt that he would just want to know his HIV status to be safe. Although, this reason came up as one of the major facilitators for men to get an HIV test, it was not the main reason that prompted them to seek HIV testing in the past. The majority of the men sought an HIV test after hearing that their sexual partner might have been infected.

Partner at risk. The majority of participants reported seeking an HIV test due to their sexual partner being at possible risk for HIV or other STI. During the interviews, many men found out from friends, coworkers, or people in the neighborhood their sexual partner was allegedly infected with a sexually transmitted infection or HIV. The thought of them sleeping with an HIV—positive individual was a driving force for them to seek an HIV test.

Most Black men have to really think that they just caught something from the girl or something and then they could turn around. They would go down and get tested or something. When they heard the girl had something, they would probably be the only reason to get checked. (Participant 6)

If there is something like I have this girl that I may have slept with and then she comes out and says something about her possibly having something, that would alert me to go to the doctor and get it checked out. (Participant 18)

Support. Participants reported that the support of family and friends going to the clinic with them to receive an HIV test assisted them in the decision to obtain an HIV test. Although many reported privacy as a main barrier to not getting an HIV test, surprisingly, some reported the comfort of a friend or family member going to get an HIV test with them as a facilitator for

getting an HIV test. One participant reported that the support he was able to provide his friend allowed him to now get tested.

> *I have a friend that I went to high school with and in school we used to talk about stuff and talk about his relationships and everything. He just came in one day and he was like "Man, I slept with this girl and she burned me man. I don't know what's going on." So, I'm like, "Man, I don't know what to tell you. All I can tell you is to go do what everybody else do and get tested." He was like, "I'm scared. I'm nervous." "I'm like, Man, look I'll go with you. It's actually going to be my first time too." And that's how I started going to get tested*. (Participant 17)

> *It was like family support for me when I went.* (Participant 19)

Women. Some participants felt that women were a major influence in their life and other Black men's lives when obtaining an HIV test. Most believed that it was the woman who had to bring up the topic of going to get an HIV test together that influenced many to get one. Most participants felt women were facilitators, and had a positive outlook on the role a woman plays in the health of a Black man.

> *Women are actually making sure that these Black men go get tested before the condom comes off.* (Participant 15)

> *If my girl is like, let's go get tested, I will go.* (Participant 24)

CHAPTER 5

DISCUSSION

Overview

This chapter evaluates the findings obtained in Phase I: Ecological Study, Phase II: Cross-sectional Study and Phase III: Qualitative study. This chapter (a) provides an assessment of the findings in context with the current literature, (b) provides additional information to the current literature, and (c) reviews the limitations within this study.

Phase I: Ecological Study

During 2010, Fulton and DeKalb Health Districts of Georgia reported the highest prevalence of HIV (Georgia Department of Public Health, 2011). According to the Georgia Department of Public Health, by 2010, the majority (74%) of persons diagnosed with HIV and AIDS were male. Research has shown that neighborhoods with high poverty are positively correlated with neighborhoods with high HIV rates (Hixson et al., 2011). Therefore, neighborhoods that have high HIV rates may also have high rates of poverty. Receiving an HIV test regularly can serve as an early detection of HIV to decrease morbidity, mortality, and HIV transmission. Publicly funded HIV test sites are federally or state funded centers and sites that provide free or low cost HIV test to the uninsured and low-income individuals. It is important for the vulnerable population of low-income Black men to have easy access to affordable HIV test. Phase I has provided a visual description of poverty among Black men and the location of publicly funded free HIV test sites within the two counties with the highest HIV and AIDS rates in Georgia: DeKalb and Fulton Counties. Phase I has used secondary data to examine poverty level among Black men by census tracts, and assess transit distance (miles) to publicly funded

free HIV test sites. The findings from Phase I provide policy-makers with the information needed to identify neighborhoods that have high concentrations of Black men living below the poverty level, and will identify the impoverished neighborhoods that do not have easy access to publicly funded HIV tests that offer free HIV test.

Summary: Phase I

When conducting a geospatial analysis of neighborhoods among Black men in DeKalb and Fulton Counties, this phase found a larger number of neighborhoods with a high percentage of Black men living below the poverty level located in downtown, and midtown areas of Atlanta, Georgia than other areas in Fulton and DeKalb counties. The downtown and midtown areas of Atlanta has 34.4% of Black residents living below the poverty level compared to 24% of Black residents living below the poverty level in the state of Georgia. This shows that poverty among Blacks is concentrated within the City of Atlanta area.

Fulton County

The Downtown area of Atlanta is located in Fulton County. Majority of the Fulton County neighborhoods that were identified as having a high proportion (> 50%) of Black men living below poverty, were located in the downtown area of Atlanta and the border of Fulton and DeKalb Counties. Fifty-seven percent (4 out of 7) of publicly funded free HIV test sites are located within neighborhoods with high poverty of Black men in Fulton County. Fulton county neighborhoods that included a high concentration of Black men living below the poverty level were: Atlanta Industrial Park, English Park, Monroe Heights, Brookview Heights, Knight Park/Howell Station, Bankhead, English Avenue, Ashview Heights, Just us, The Villages at Castleberry Hill, Downtown, Old Forth Ward, Sweet Auburn, Mechanicsville, Pittsburgh, Choosewood Park, Englewood Manor, Thomasville Heights, Leila Valley, Norwood Manor,

Atkins Park, Virginia Highland, Wildwood, Springlake, Collier Hills, Memorial Park, Argonne Forrest, Tuxedo Park, Chastain Park, East Chastain Park, Rockdale, West Highlands, Englewood Manor, Cabbagetown, and Reynoldstown. The findings from this aim found that neighborhoods with high poverty among Black men geographically neighbor other neighborhoods with high poverty among Black men in Fulton County. The findings prove the hypothesis that impoverished neighborhoods among Black men neighbor other impoverished neighborhoods. The null hypothesis of no clustering was rejected because there was statistically significant evidence that showed large clusters of neighborhoods where Black men are living below the poverty level in Fulton County.

DeKalb

DeKalb County borders Fulton County and contains approximately 10% of the city of Atlanta. The neighborhoods in DeKalb County that presented high concentrations of Black men living below the poverty level were Druid Hills, North Druid Hills, Edgewood, and Downtown Decatur. There were no publicly funded free HIV test sites located within neighborhoods with high proportions of Black men living below the poverty level in DeKalb County. The findings from this aim also found that neighborhoods with high poverty among Black men geographically neighbor other neighborhoods with high poverty among Black men. The findings prove the hypothesis that impoverished neighborhoods among Black men neighbor other impoverished neighborhoods. The null hypothesis of no clustering was rejected because there was statistically significant evidence that showed large clusters of neighborhoods where Black men are living below the poverty level in DeKalb County.

Transit Distance

The findings showed that neighborhoods within DeKalb and Fulton Counties with high proportions of Black men living below poverty are closer in transit distance (miles) to a publicly funded free HIV test than neighborhoods with Black men living at and above the poverty level. Previous literature has assessed distance to Community-based or AIDS service providers that offer voluntary testing and counseling within Metropolitan Atlanta area (Hixon et al. 2010); however, the distance to publicly funded HIV tests that offer free HIV test has not been explored. The information from Phase I fills the gap in the literature by including another type of test site such has publicly funded HIV test sites that offer free HIV test and assessing the distance from impoverished neighborhoods among Black men.

Interpretation

Atlanta is often referred to as "the most progressive city in the South." Although, Atlanta is home to many celebrities, executive entrepreneurs, and million dollar corporations such as Coca-Cola, and AT&T, poverty among Black men is still prevalent within this city. As 2009 ended, unemployment among Black males was 17%, which was almost double the percentage among White males (9.5%). Hixon et al. 2011 found that neighborhoods with high rates of HIV and AIDS within Metropolitan Atlanta were also identified as impoverished neighborhoods. Due to Black men accounting for 70% of the HIV and AIDS cases in Georgia, and 17% of the Georgia's population living below the poverty level, it is important for free HIV test to be readily available within neighborhoods where high proportions of Black men are living below poverty.

In DeKalb and Fulton Counties, this study found as the proportion of Black men living below the poverty level increased within a neighborhood, the transit distance (miles) between impoverished neighborhoods among Black men and publicly funded free HIV test sites

decreased. Therefore, neighborhoods with high proportions of Black men living below the poverty level were closer in distance (miles) to publicly funded free HIV test sites than neighborhoods with low proportions of Black men living below the poverty level. The variation in transit distance based on poverty level differed among Black men in Fulton County (15%) compared to DeKalb County (3%). The difference of variation in transit distance based on neighborhood-level poverty may be different between the two Counties due to (a) an increased number of clustered impoverished neighborhoods among Black men in Fulton County compared to DeKalb County, (b) more publicly funded free HIV test sites located within the impoverished neighborhoods among Black men in Fulton County (4 of 7 free HIV test sites) compare to DeKalb County (0 of 2 free HIV test sites), and (c) public health officials targeting Downtown and Midtown neighborhoods within Fulton County to place publicly funded free HIV test sites due to the increased number of Black MSM residents.

Public health officials should not overlook the fact that DeKalb County has the highest prevalence of HIV in Georgia. Although, DeKalb County has the highest prevalence of HIV in Georgia there were no publicly funded free HIV test sites identified within neighborhoods with high concentrations of Black men living below the poverty level in DeKalb County. In order for an HIV test site to offer free HIV test at no cost to the individual, public health officials should allocate funds to the identified publicly funded HIV test sites that currently offers low-cost HIV test but not free HIV test. This will allow Black men who have no source of income the opportunity to have access to free HIV test.

Although the Centers for Disease Control and Prevention headquarter is located within, Metropolitan Atlanta, Georgia is still among the top 10 states with the highest prevalence of HIV and AIDS among Black men in the United States. CDC has recognized this, and has

implemented a high-impact prevention approach to increase HIV testing among Black men. This initiative includes the Expanded Testing Initiative Project, the MSM testing initiative, Many Men-Many Voices (3MV) program, d-up: Defend Yourself program, and Testing Makes Us Stronger campaign. The findings from this study have identified optimal impoverished neighborhoods that would benefit from these programs and initiatives due to high poverty among Black men and lack of access to free HIV test. CDC recently awarded $55 million dollars over 5 years to 34 community-based organizations (CBOs) to provide HIV testing to men of color to identify unrecognized HIV infections.

The impoverished clustered neighborhoods that were identified in Phase I should be targeted for health promotion, prevention, free health care services, and free HIV test. In order for a Black male living below poverty to maintain his health, one must have access to free or affordable healthcare services. By this aim identifying the highly clustered poor neighborhoods, free healthcare facilities can target these neighborhoods to improve the overall health among Black men while allowing them the opportunity to know their HIV status early by having access to free HIV test.

Study Limitations

This study has limitations that need to be taken into consideration. The list of HIV test sites were provided by the Georgia Department of Public Health in 2011. Therefore, any publicly-funded free HIV test site that became incorporated after 2011 was not included in this study. All HIV test sites were called via telephone to verify publicly-funded status, the facility provides free (not sliding scale) HIV test, and offer services to adult men. This study also restricted the analysis to publicly funded HIV test sites that only provided free HIV test. Therefore, low-income individuals may have access to low-cost HIV test from publicly funded

HIV test sites; however, do not have access to free HIV test. Sites that did not answer the phone after 3 different calls, did not return voice messages, or phone number was disconnected were not included in this study. Due to Phase I being an ecological study, it is subject to ecologic fallacy. The findings in this study were carefully explained as neighborhood results and not individual results to decrease the possibility of ecologic fallacy. The results of poverty level clustering are aggregated data at the census tract level; therefore, unable to fully describe the individual poverty level within these communities when identifying highly impoverished clustered neighborhoods among Black men. Although, transit distance was based on road network navigation distance to limit imprecision, mileage may fluctuate due to the distance being based on the centroid of a census tract and not the distance between an individual's home of residence and publicly-funded free HIV test site. These findings are based on poverty level data from 2005 to 2009; therefore, may not capture the gentrification taking place within some of these impoverished neighborhoods such as Old Forth Ward and East Atlanta. The proportion of Whites in Metropolitan Atlanta is increasing from 31% in 2000 to 38% in 2010. This increase of White individuals moving towards the Metropolitan inner city neighborhoods is due to the destruction of housing projects to replace with luxury condominiums, upscale restaurants and houses. This gentrification comes with praise from individuals who want to move within this community or want to have thriving businesses within these neighborhoods. However, the gentrification also comes with despair from individuals who have been raised within these neighborhoods and raising their families in affordable housing facilities within these neighborhoods.

Phase II: Cross-Sectional Study

In phase II, a study was conducted among 513 Black men that resided in DeKalb and Fulton Counties, Georgia. Surveys were completed among this group from July 2012–September 2012.

Summary: Phase II

In this survey of 513 adult (18 to 69 years old) Black men, there was statistically significant evidence that found for every one mile increase in transit distance from a publicly-funded free HIV test site, Black men were 1% more likely to have had an HIV test in the past 12 months (Adjusted PR: 1.01 95% CI: 1.00–1.02). There were no covariates that were identified to serve as a confounder or effect measure modification when examining the relationship between transit distance and HIV testing in the past 12 months. However, several factors were identified as independent predictors of HIV testing in the past 12 months. The county of residence, ever receiving an STI test, having a regular doctor, and type of health insurance all served as independent predictors of HIV testing in the past 12 months among this study population of Black men.

Black men that lived in Fulton County were 27% more likely to have an HIV test in the past 12 months than Black men living in DeKalb County. Black men without a regular doctor were 23% less likely to have an HIV test in the past 12 months than Black men with a regular doctor. Black men that reported not having a STI test at least once in their lifetime were 71% less likely to have an HIV test in the past 12 months than Black men who had taken a STI test at least once. Black men who received Medicaid, Medicare or Public Assistance were 30% less likely to have obtained an HIV test in the past 12 months than Black men receiving private health insurance.

A large sample of men that obtained an HIV test in the past 12 months, and lived more than 4.4 miles away from the nearest publicly-funded free HIV test clinic mostly lived in Fulton county, were between the ages of 18–44 years old, owned a vehicle, were employed and earned less than $1,500 gross income monthly, had taken an STI test at least once in their lifetime, had a regular doctor, private insurance, had low perceived risk of HIV, and weak gay stigma.

A large sample of men that did not obtain an HIV test in the past 12 months and lived within 4.4 miles from the nearest publicly-funded free HIV test site were mostly between the ages of 18–29 years old, employed and earned less than $1,500 monthly as gross income, did not own a vehicle, used public transportation as the primary means of transportation, did not have a regular doctor, uninsured, and had low perceived risk of HIV.

Interpretation

In Phase I, the median transit distance difference between a participants home address and the nearest publicly funded free HIV test sites was similar (4.3 and 4.4 miles) among Black men that have received an HIV test in the past 12 months and Black men that have not received an HIV test in the past 12 months. The null hypothesis of no difference in HIV testing in the past 12 months based on transit distance was rejected due to statistically significant evidence showing for every one mile increase in transit distance from a participants home address to the nearest publicly funded free HIV test site, Black men were 1% more likely to have an HIV test in the past 12 months when holding constant factors such as county of residence, ever receiving an STI test, having a regular doctor and type of health insurance. These factors also served as statistically significant independent predictors of HIV testing in the past 12 months among Black men. The multivariate regression model was built based on theory and statistical test. The goodness-of-fit test was used after developing a parsimonious multivariate regression model to

examine the fit of the multivariate regression model with the overall data. The statistical test of goodness-of-fit confirmed that the parsimonious multivariate regression model was the best fit model when examining the relationship between transit distance and HIV testing in the past 12 months among Black men.

This study hypothesized Black men living closer to a publicly-funded free HIV test site are more likely to have an HIV test in the past 12 months than Black men living at a greater distance. The 1% effect is in the opposite direction than one hypothesized. Instead of the proportion of HIV testing increasing with a shorter transit distance to a publicly funded free HIV test site, the proportion of HIV testing was reduced with shorter distance. These findings brings new information to the literature about the relationship of transit distance between home address and publicly-funded free HIV test sites on HIV testing among Black men in DeKalb and Fulton Counties, Georgia.

Findings from this specific aim contradict results from a previous study. Previous literature showed that the closer an individual lives to an HIV test site the more likely that individual is to have an HIV test (Leibowitz & Taylor, 2007). Leibowitz and Taylor (2007) found that for every one mile increase in transit distance from a publicly-funded HIV test site, individuals were 8% less likely to have ever received an HIV test. However, this study did not examine the transit distance and HIV testing relationship solely among Black men. Leibowitz and Taylor (2007) study also examined the relationship between distance and ever receiving an HIV test compared to this study that examined distance and HIV testing in the past 12 months. Leibowitz study consisted of 11% Blacks, 47% females, and the study population in this study consisted of 100% Blacks, and 100% male. The difference between populations must be taken into consideration when comparing results related to distance and HIV testing. This relationship

may show different HIV testing outcomes when assessing the relationship between transit distance and HIV testing in the past 12 months among Black men than other racial/ethnicities groups due to other barriers such as HIV/AIDS related stigma that is prevalent in the Southern United States and among Black men.

The relationship between transit distance to free HIV test sites and HIV testing is important to assess among vulnerable populations living in areas of high HIV and AIDS rates. The District of Columbia, Baltimore, Baton Rouge, New Orleans, DeKalb and Fulton have high prevalence of HIV and AIDS among Blacks and are among the top 10 Metropolitan areas with the highest HIV prevalence. These areas also have similar demographics such as the percentage of Black residents, percentage of residents living below the poverty level, percentage of Black HIV and AIDS cases (see Table 29). Future studies should examine the transit distance and HIV testing in the past 12 months relationship among Black men in counties or districts with similar demographics as DeKalb and Fulton Counties.

Table 29. Demographics of Counties and Districts similar to DeKalb and Fulton Counties, 2011.

County and District	%
Black Residents	
DeKalb	54 %
Fulton	45 %
District of Columbia	51 %
Baltimore, Maryland	63 %
Baton Rouge, Louisiana	50 %
New Orleans, Louisiana	60 %
Population living at or below the poverty level	
DeKalb	17 %
Fulton	16 %
District of Columbia	18 %
Baltimore, Maryland	22 %
Baton Rouge, Louisiana	24 %
New Orleans, Louisiana	26 %
HIV and AIDS cases among Blacks	
DeKalb	70 %
Fulton	70 %
District of Columbia	

Baltimore, Maryland	88 %
Baton Rouge, Louisiana	82 %
New Orleans, Louisiana	76 %

Source: U.S. Census Bureau. (2011a-c). Population.

When assessing the transit distance and HIV testing in the past 12 months relationship at a greater distance, the findings from specific aim 2 suggest that for every 5 mile increase from a participant's home address to a publicly-funded free HIV test site, Black men were 7% more likely to have an HIV test in the past 12 months in DeKalb and Fulton Counties, Georgia. For every 10 mile increase, the likelihood of a Black man having an HIV test in the past 12 months is 14%; and for every 20 mile increase, Black men were 30% more likely to have an HIV test in the past 12 months (see Table 30).

Table 30. The effect of transit distance on HIV testing in the past 12 months as mileage increase.

e^{β} (1 mile)	Prevalence Ratio
$e^{0.0131758}$ (1 mile)	1.01
$e^{0.0131758}$ (5 mile)	1.07
$e^{0.0131758}$ (10 mile)	1.14
$e^{0.0131758}$ (20 mile)	1.30

Although the finding of living further from a free HIV test site increases the likelihood of receiving an HIV test in the past 12 months among Black men is paradoxical to the hypothesis, it was also found that the majority of participants who reported ever taking an HIV test received their test in a private doctor's office versus a clinic. Phase II has provided pertinent information that allows a snap-shot of the relationship between transit distance and HIV testing in the past 12 months among Black men. Through survey methodology, researchers are able to identify specific answers to certain questions. However, one limitation to surveys is not being able to capture the reasons behind these answers. In Phase III, a qualitative study was conducted employing one-on-

one interviews with 26 additional Black men from DeKalb and Fulton counties, Georgia. The findings from Specific Aim 3 will shed light on additional barriers Black men face when obtaining an HIV test that may serve as stronger barriers than transit distance to a publicly funded free HIV test site among Black men.

Limitations

Results of the study must be considered in light of some limitations. First, data in this study were self-reported by participants; therefore, the validity may be in question and may serve as potential responder bias. Participants may have under-reported HIV stigma or Gay stigma while over reporting of HIV testing. An additional limitation of this study is that it is a cross-sectional study design. In other words, the study only provides a "snap shot" of this association at one particular point in time, instead of being able to examine the relationship of distance and HIV testing over time. Therefore, the results do not assess causality of transit distance on HIV testing and cannot measure change, but assesses the association at this particular point in time.

This study limited interviewer bias during the design and implementation phase by carefully designing the study and conducting quality assurance and control activities, training the recruitment team and standardizing data collection procedures. Seasonal bias is not likely in this study due to assessing HIV testing in the past 12 months (outcome variable). By assessing whether a participant received an HIV test in the past 12 months allows seasonal bias to be limited due to 12 months expanding all seasons and times within a year period.

Due to a higher percentage (32%) of Black men in the study population attaining a Bachelor or higher degree than the general population of Black men in DeKalb (23%) and Fulton (26%) Counties, caution must be implemented when comparing study results to the general population of Black men. For example, among the study population of Black men that reported

having a regular doctor and private health insurance majority were men that attained a Bachelor or higher degree. Therefore, Black men with a regular doctor may travel the distance to his private doctor office to obtain an HIV test than a Black man without a regular doctor. According to the American Community Survey (2009-2011), only 23% to 26% of the general population of Black men residing in DeKalb and Fulton attained a Bachelor or higher degree. Therefore, many Black men within these two Counties may not have a regular doctor and private health insurance due to the lower percentage of men attaining a Bachelor or higher degree. Since not having a regular doctor and having Medicaid, Medicare or Public Assistance health insurance serves as independent predictors for not receiving an HIV test in the past 12 months, this difference of characteristics among Black men in the study compared to the general population of Black men in DeKalb and Fulton County must be taken into consideration when assessing transit distance and HIV testing in the past 12 months among Black men. Despite the study limitations, these findings have important implications for future research on HIV testing among Black men.

Phase III: Qualitative study

In Phase III, one-on-one interviews were conducted with 26 additional Black men from DeKalb and Fulton counties, Georgia to better understand barriers and facilitators when obtaining an HIV test. Phase III provided further insight into the barriers Black men face when seeking an HIV test that surveys may not be able to capture.

Finding: Specific Aim 3

To answer Specific Aim 3, interviewees identified barriers and facilitators when obtaining an HIV test. There were several factors identified in this qualitative study that influenced Black men in their decision-making processes to seek an HIV test. Black men in this study identified several significant barriers that added to their reluctance when obtaining an HIV

test. Three leading barriers were identified: (a) fear of being HIV-positive and having to deal with the realty of knowing they were positive; (b) belief that HIV testing is more of a Gay Man Test; and (c) being judged and perceived negatively by others when possibly seeking HIV testing. Four major facilitators that were identified to seek an HIV test were: (a) high perceived risk of HIV; (b) partner at risk for HIV or other STI; (c) support from peers/family; and (d) women's influence for the man to obtain an HIV test.

Interpretation

Black men in this study population identified many common barriers when obtaining an HIV test. Regardless of their county of residence, age, or HIV testing history, majority of the barriers when obtaining an HIV test were common among this study population. Many participants believed they probably already had HIV due to society reporting the high percentage of Black men accounting for the HIV and AIDS cases. Many participants allowed the fear of being HIV positive serve as a barrier when obtaining an HIV test. Due to this fear, if the study population of Black men were HIV positive and asymptomatic, they did not want to know if they were truly infected with HIV.

Majority of the participants expressed the concern of friends, neighbors, and by-standers serving as a barrier when obtaining an HIV test from an HIV test clinic due to being judged. The hurdle to walk into an HIV or STI clinic was too high and filled with the stigma that others would automatically think they were HIV positive or homosexual. Majority of the participants reported their sexual orientation as homosexual and the fear of other's knowing their sexual orientation was a concern when obtaining an HIV test.

HIV and AIDS related stigmas are still prevalent among the Black male population in Atlanta, Georgia. This study population of Black men identified influencers that may provide

them with the tools to overcome these barriers such as family, peers, and sexual partner support. Although, it will take time to tackle specific HIV and AIDS related stigmas among Black men, capitalizing on these facilitators is important to recognize and incorporate into HIV and AIDS prevention programs among Black men.

Limitations

Results of the study must be considered in light of some limitations. First, the findings are based on self-reported data from study participants. To minimize the limitation of self-reported data, interviewers developed rapport with each participant to enhance levels of trust. Second, this study may be subject to researcher bias. Several strategies were employed to minimize bias by having the investigator (female) conduct half of the interviews and a Black male conduct the other half of the interviews. During training sessions with the interviewer, the need to not omit questions and alter answers was reviewed. Although, this study was designed to reduce interviewer bias, it may be present due to a female conducting half of the interviews among Black men, and the possibility of men not feeling comfortable to speak with a woman about his HIV testing. To reduce this bias, a trained male interviewer conducted 50% of the interviews to compare the difference in results. Results showed no difference in the number of themes and openness of the participants. Third, non-probability sampling techniques such as convenience and snowball sampling were utilized during the recruitment phase of this study. The high proportion of Black homosexual and bisexual men in this study may be due to snowball sampling. Participants may have referred their sexual partners or peers with similar homosexual behaviors to the study. The barriers and facilitators identified in Phase III may be different among heterosexual Black men. Despite the study limitations, the findings have important implications for future research on HIV testing among Black men.

Conclusion

This qualitative study provided an in-depth insight into human behavior and the perception Black men have when deciding whether to obtain an HIV test. Responses from the study population of Black men shows their concerns are viable and that society still has work to do when overcoming many of their objections when obtaining an HIV test. In this chapter, results of Phase I—The Ecological Study, Phase II—The Cross-Sectional Study, and Phase III—The Qualitative Study are complementary tools that allow one to further analyze data collected while gaining a better understanding of Black men's hesitancy when obtaining an HIV test. Results from these phases support an expansion of epidemiological knowledge on the influences that affect the decision to seek HIV testing among Black men.

CHAPTER 6

IMPLICATIONS TO PUBLIC HEALTH

Overview

This dissertation is a product of completing the Doctor of Public Health degree program. Therefore, it provides implications in the 5 core discipline areas of public health: (a) Epidemiology (b) Biostatistics (c) Health Promotion and Behavior (d) Environmental Health Science, and (e) Health Policy and Management. This section will discuss implications in these 5 core areas of public health.

Epidemiology and Biostatistics

The findings from this study have several implications in the area of Epidemiology and Biostatistics by conducting a study on a high-risk population such as low-income Black men when examining the relationship between transit distance and HIV testing in the past 12 months. Due to this study focusing on an area that has not been thoroughly explored previously in the United States, results provide evidence-base findings about the association between transit distance and HIV testing in the past 12 months using primary data collection methods to obtain individual-level data. Previous studies have focused on the relationship between distance and healthcare settings in rural counties; however, this study specifically focused on two metropolitan counties, due to the high prevalence of HIV and high poverty among Black men in these areas.

Numerous studies have identified independent predictors of HIV testing among the Black MSM (men having sex with men) population. This study consciously focused on identifying predictors of HIV testing among all Black men regardless of their sexual orientation. While it is

important to conduct studies among a high-risk population such as Black MSM, it is equally as important to decrease HIV and increase HIV testing among the entire Black population. Previous studies showed that the rate of HIV has increased among Black females and Black MSM. This study found that some Black men strongly believe men receiving an HIV test are homosexual, and more homosexual men are obtaining an HIV test than heterosexual men. These feelings were categorized as "Strong Gay Stigma" and "Strong HIV Stigma." These strong feelings of gay and HIV-related stigma, may contribute to the reluctance of heterosexual men seeking an HIV test or a bisexual man not reporting his sexual relationships with a male, due to the fear of judgment from peers, family members and sexual partners. If studies only focus on Black MSM, we may not capture valuable information from Black men who are having sex with women and men because they may not identify themselves as bisexual men due to "HIV"- related and "Gay"-related stigma.

Future studies should take the opportunity to explore the transit distance and HIV testing relationship more while focusing specifically on Black men to provide researchers and policy-makers with more evidence-based findings concerning this relationship. Future studies also are warranted to examine the association between distance and HIV testing among Blacks in rural parts of Georgia. Although 68% of the reported AIDS cases in Georgia are within the Metropolitan Atlanta area, the morbidity rate of AIDS is 18.0 for rural Georgia and the mortality rate is 9.1 per 100,000 (Georgia Department of Public Health 2010). This would be an area of opportunity to build on the findings from this research study.

This study identified covariates such as county of residence, previous STI testing, having a regular doctor, and type of health insurance as independent predictors for having an HIV test in the past 12 months. Although interactions between covariates and HIV testing in the past 12

months by distance was not present in this study, there were a few qualitative interactions that could be explored in future studies. Due to this observation not serving as a statistically significant qualitative interaction, it was not explored further in this study. Covariates that served as non-significant qualitative interactions were monthly salary, primary means of transportation, having a regular doctor, type of health insurance, perceived risk of HIV, and gay stigma. Although, not statistically significant in this study, covariates may serve as possible subgroups for future studies when examining the relationship between transit distance and HIV testing.

Environmental Health Science

Black males have the highest HIV and poverty rates in the South, which are higher than other parts of the United States. Previous studies have found that social and environmental factors serve as barriers to the utilization of health services for Black men (Bonhomme, 2004). Access to HIV test sites are influenced by various social determinants of health. Social and environmental factors such as income, employment, education, and neighborhood segregation serve as barriers and facilitators when obtaining preventative care such as HIV testing. This evidence suggests that environmental factors account for a substantial amount of the differences in HIV rates. Previous studies have found that proximity is a major factor in social relationships within urban neighborhoods and those social and environmental factors among neighborhoods influence individual actions (Greenbaum et al., 1985; Leibowitz & Taylor, 2007). This study revealed geographic clusters of Black men living below the poverty level in neighborhoods within the city of Atlanta, mostly in the downtown, midtown and old fourth ward neighborhoods. Hixson et al. (2011) conducted a spatial analysis study that identified clusters of HIV and social determinants of HIV in Metropolitan Atlanta. This study found that highly clustered neighborhoods of HIV were centralized in the downtown Atlanta area within Fulton County and

the border of DeKalb County where the two counties join (Hixson et al., 2011). The Hixson study also found that highly clustered neighborhoods with a high prevalence of HIV were statistically significantly associated with higher levels of poverty. The same clustered neighborhoods identified as having high prevalence of HIV and high poverty in the Hixson study were the same clustered neighborhoods found in this study to have high concentrations of Black men living below the poverty level. These findings provide insight into the relationship of individual and community-level factors of HIV; therefore, serving as barriers and facilitators of HIV testing. Future structural interventions such as educational attainment, resume building, writing workshops, job fairs, rehabilitation after imprisonment into the work force and poverty alleviation, may decrease the poverty among Black men living within these impoverished neighborhoods in DeKalb and Fulton Counties, Georgia.

Health Promotion and Behavior

This study was implemented based on the Andersen's Behavioral Model, which took into account various predisposing, enabling, impeding, and need factors that influence Black men decision to obtain an HIV test. The cross-sectional study found an association between transit distance and HIV testing in the past 12 months among this population. Although the finding was opposite to what was hypothesized, when participants were given the opportunity to voice their opinions during one-on-one interviews concerning their comfort level of where they would obtain an HIV test, majority did not want to obtain an HIV test at a clinic within their neighborhood. Majority expressed concern of confidentiality issues, fear of seeing neighbors or peers in the HIV testing facility, and the fear of people judging them for going into an HIV test clinic to receive an HIV test. These concerns were identified as barriers, which influenced their decision to test in neighborhoods outside of their own due to the fear of seeing someone they

knew. These findings provide better insight into the reason why studies have found a higher percentage of individuals testing at private doctors' offices instead of HIV and STI clinics.

The need to implement HIV educational programs among Black men is imperative. Educational programs should provide information on the different ways to obtain an HIV test (e.g. confidential and anonymous HIV test), locations to obtain an HIV test, and issues regarding HIV/AIDS-related stigma. HIV education programs need to be tailored during the developmental stage specifically to Black men. Although findings from the cross-sectional study showed that the majority of participants had weak gay stigma and weak HIV-related stigma, findings from the qualitative study showed conflicting results because many of the men expressed strong feelings of gay stigma and HIV-related stigma during a one-on-one interview. This provides researchers with the knowledge to possibly conduct mixed method studies that incorporate one-on-one interviews to gain a full understanding of the factors that influences Black men to seek and obtain an HIV test.

In the qualitative study, it was also discovered that there was a lack of knowledge about HIV test concerning confidential and anonymous test, home test, and the accuracy of results from the oral swab test compared to the blood test. This is an area of opportunity for HIV educational programs to educate Black men in these areas, to provide them with the correct information concerning HIV tests instead of them receiving inaccurate information from blogs on the internet or friends instead of a Healthcare Professional. Participants in the qualitative study identified several events they felt would capture the attention of Black men when trying to achieve the goal of increasing HIV testing. Instead of hosting formal events for HIV education, many suggested public health professionals hosting: Health Awareness BBQs that incorporated HIV education and free testing; Health Awareness Concerts that incorporated HIV education and

free testing; incentives for taking an HIV test such as sneakers, money, or clothes; theater plays on HIV awareness held at the Underground Atlanta location in Downtown Atlanta; Neighborhood Basketball All-Star events that has HIV education and free testing; healthcare fair or carnival with HIV education and free testing; and neighborhood play station battle party that provided HIV education and free HIV test. Majority of the participants expressed the need to specifically tailor HIV events, interventions and programs to what Black men find interesting such as concerts, music, and sports instead of having a formal school room type setting. They expressed the need for these programs to cover all aspects of health and not just HIV due to HIV-related stigma. Future HIV intervention and prevention programs for Black men should take these suggestions from the study population of Black men into account since a Black male will better understand what would attract him and his Black male peers to attend HIV-related intervention and prevention programs. These ideas provide researchers with innovative ways of designing and promoting programs when beginning to educate Black men about HIV/AIDS and HIV testing.

Health Policy and Management

Findings in the cross-sectional design and qualitative study have shown that Black men obtain an HIV test more often at a private doctor's office setting than at an STI and HIV clinic. Participants in this study expressed their reasons for not seeking an HIV test at an STI or HIV clinic due to privacy concerns, judgment, and unprofessionalism of staff at these facilities. The first recommendation this study suggests is for policy makers to place male-only healthcare facilities within the identified clustered impoverished neighborhoods in DeKalb and Fulton counties, Georgia. This will allow low-income individuals the opportunity to have access to these facilities.

Additionally, due to the fear of being judged when entering an HIV or STI clinic, it is also recommended to have these facilities provide preventive services in various areas of one's health such as HIV/AIDS, STIs, cardiovascular disease, prostate cancer, diabetes, and strokes. By implementing this recommendation, Black men will feel more inclined to enter a facility within their neighborhood that offers holistic education and prevention screening services in various areas of health. By implementing this recommendation, Black men will not feel the same fear of judgment when entering a male-only general health care facility, as they feel when entering an HIV or STI clinic. This recommendation focuses on decreasing the barrier of judgment when entering an HIV clinic. This information provides researchers with the knowledge that focuses on decreasing structural and individual level barriers to increase HIV testing among Black men. To accomplish this goal, policy makers should begin to provide this target population with male-only general healthcare facilities where Black men feel comfortable to enter and receive an HIV test.

The next recommendation this study suggests is for the male-only healthcare facilities to implement mandatory customer service, confidentiality, and counseling/support trainings or workshops for all staff working at these facilities. Men entering these facilities may be faced with anxiety from getting an HIV test, depression from finding out if he is HIV-positive, diabetic, or has cancer. Therefore, it is essential that employees are trained on comforting techniques for their patients and understands the importance of sensitivity, respect, and confidentiality for their patient's health. This training should be mandatory and conducted twice a year for all clinic staff such as front desk clerks, nurses, physician assistants, physician's, interns, and anyone else that may work in this facility. This recommendation will allow Black

men the opportunity to feel comfortable entering a facility with professional, respectful, and confidential staff.

The final recommendation is to implement the ideas provided by the participants from the in-depth interviews to increase HIV testing among Black men. Majority of the participants suggested having anonymous HIV testing and education seminars that cover topics on HIV, AIDS, blood pressure, stress, diabetes, and prostate cancer held in non-formal settings such as: concerts, fairs, carnivals, play game-station day, and neighborhood basketball tournaments. This is an area of opportunity for Public Health officials to develop and implement innovative events for health screening and prevention events. This is the time when public health officials need to establish community collaboration building and partnerships to develop activities with local organizations and agencies to support health promotion and disease prevention events targeted to Black males. Through this collaboration, external stakeholder, community leaders, and public health officials have the opportunity to host non-formal events that provide a holistic approach to Black men's health by providing various health screening measures within the event. During the non-formal event Black men will have the opportunity to learn more about HIV and AIDS, diabetes, obesity, blood pressure, prostate cancer and stress. They will have the opportunity to get their blood pressure, glucose-level, weight checked, and receive a free and anonymous HIV test, and other screening measures related to their overall health. This will bring Black men together of all ages to learn more about their health without having to overcome the stigma attached to HIV and AIDS.

If these recommendations are implemented by policy makers and public health officials, this will establish a platform of success for Black men's health. This platform of success will not only benefit the area of increasing HIV testing among Black men, but also improve Black men's

health in other areas such as heart attacks, strokes, diabetes and prostate cancer. If these recommendations are implemented, these facilities will provide Black men with the confidence in knowing they have easy access to a safe and private facility to obtain preventive screening measures in many areas of their health.

Future Direction for Atlanta Inner-City Neighborhoods

When proposing recommendations to place male-only healthcare facilities in Atlanta's poor neighborhoods, one must also understand the revitalization plans for these low-income neighborhoods. The quest to change and improve the inner-city neighborhoods of Atlanta has been in the making since the 1970s. Gentrification has taken place within the neighborhoods of Atlanta due to the influx of a wealthier class of residents buying into an area of lower income residents. Although improvement of poor neighborhoods is for the betterment of the community, this transition comes with a price for low-income residents currently residing within these communities. This movement of gentrification will lead to high property values that will result in higher rents. Individuals with no or low income will be displaced from their current homes due to the higher cost of living serving as a burden. Atlanta's inner city neighborhoods have experienced gentrification during the 1996 Summer Olympics and large scale Atlantic Station investment project (Hankins & Powers, 2009). Atlantic Station is located in midtown Atlanta, and was a major investment project that took large parcels of land that was considered a revitalization of low-income urban neighborhoods to a more productive use of neighborhoods with luxury condominiums, townhomes, outside malls and up-scale restaurants. As mentioned before, the Atlanta Beltline project will be the next major expected event to bring gentrification to the inner-city neighborhoods of Atlanta. The beltline is an environmental friendly green plan to develop a 22 mile loop around the inner city into bike paths, new shopping, parks, and

housing, served by new street cars and light rail. It will be used to connect Atlanta's neighborhoods to shape the desirability of a ring of neighborhoods around the city, which raises questions about the thread of gentrification and residential displacement across the city. Many working class families from the neighborhoods of South Atlanta have raised concerns about gentrification and displacement. The beltline is expected to take 25 years to complete.

Due to the revitalizing of the inner city neighborhoods over the next two decades, researchers and policy-makers, have to work with urban theorists and geographers to better understand the neighborhoods low-income individuals may transition to due to the influx of higher-income individuals moving into luxury condominiums and townhomes in neighborhoods that once encompassed low-income families. King Williams and Ajay Reeves have directed a documentary on Atlanta's gentrification titled "The Atlanta Way: a Documentary on Gentrification." This documentary is expected to be released Spring 2013, and deals with the current gentrification of Atlanta, specifically, the razing of nearly every public housing project in Atlanta, and the displacement of current residents.

Although, the development of new homes and influx of affluent individuals may move within these low-income Atlanta neighborhoods, the poverty and high rates of HIV does not cease or disappear, it just transitions geographically to a different neighborhood. Therefore, researchers need to understand the spatial epidemiology and transition of low-income Black men during this revitalizing time within inner-city Atlanta neighborhoods, to effectively implement the recommended changes from STI clinics to male-only holistic general healthcare facilities.

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APPENDICES

APPENDIX A

CONSENT FORM (SPECIFIC AIM 3)

CONSENT FOR ONE-ON-ONE INTERVIEW

FACTORS THAT AFFECT BLACK MALES' DECISION TO SEEK OR NOT SEEK HIV TESTING

RESEARCH STUDY BY THE UNIVERSITY OF GEORGIA

WHY ARE YOU BEING INVITED TO TAKE PART IN THIS RESEARCH?

You are being asked to take part in a research about HIV testing. This consent is for a one-on-one interview only. You are being invited to take part in this research study because you: 1) are a Black male 18 years and older 2) live in one of the four studied counties: DeKalb, Fulton, Clayton or Cobb 3) has taken an HIV test in the past 10 years or has never taken an HIV test and 4) can speak and understand English. If you volunteer to take part in this study, you will be one of 24 people.

WHO IS DOING THE STUDY?

The person in charge of this study is Dr. Christopher Whalen, Researcher and Professor at *The University of Georgia* and Ms. Tiffany Parr, MSPH, researcher and Doctoral candidate, at *The University of Georgia*.

WHAT IS THE PURPOSE OF THIS STUDY?

By doing this part of the study or conducting the one-on-one interviews, we hope to gather information to help HIV testing sites better understand barriers that exist among Black males that keep them from getting tested so we can begin the process of removing these barriers. This information will also help HIV testing sites to better understand the reasons Black males decide

to seek HIV testing so we can capitalize on these reasons to increase HIV testing among Black males.

WHERE IS THE STUDY GOING TO TAKE PLACE AND HOW LONG WILL IT LAST?

The interview will be conducted in a private study room in a local library in the County you live in or in a private room at a local community-based organization. The library will be chosen close to the neighborhood you live in so you will not have to travel too far for the interview. You will need to come to this site once during the study. The interview will take about 60 minutes. The total amount of time you will be asked to volunteer for this part of the study is 80 minutes. The extra 20 minutes is time needed to read and sign the consent form.

WHAT WILL YOU BE ASKED TO DO?

You will attend one interview and answer questions about what your thoughts on HIV testing, and your experience to get or not get a HIV test. The interview will last about 60 minutes with an additional 20 minutes to fill out the consent form. The interview will be recorded using an audio tape recorder. We will ensure there is nothing that connects your voice on the recording to your name or identifiable information. I will ask you to create your own made-up name to protect your identity. I will refer to you as that name throughout the study and any reports developed from this study.

WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS?

There are no risks in you taking part in the interview. Some questions you are asked to comment about may cause minor discomfort. Some sensitive information collected could go beyond discomfort to risk if there were a breach of confidentiality. However, precautions are set in place so your privacy is protected. You may choose not to talk or to leave the interview if you are not comfortable at any time.

WILL YOU BENEFIT FROM TAKING PART IN THIS STUDY?

You will not get any direct benefit from taking part in this study. You taking part, however, may, in the future, help us to develop better ways to encourage other Black males to be tested for HIV by removing some of the barriers that may keep Black males from seeking HIV testing.

DO YOU HAVE TO TAKE PART IN THE STUDY?

You do not have to take part in this study. If you decide to take part in the study, it should be because you really want to volunteer. You can stop at any time during the interview. Your participation is voluntary. You can refuse to participate or stop taking part at any time without giving any reason and without penalty or loss of benefits to which you are otherwise entitled.

WHAT WILL IT COST YOU TO PARTICIPATE?

There is no cost to you for taking part in the interview.

WHO WILL SEE THE INFORMATION THAT YOU GIVE?

We won't record your birth name or identify you in any way with our reports. You will be identified by the name you created for yourself at the beginning. We may share the information you provide with other researchers in reports or papers. However, they will not be able to identify you or know your name.

We will make every effort to prevent anyone who is not on the research team from knowing that you gave us information. We will destroy the audiotapes of the interview as soon as they are converted to a paper record. We will keep the paper records and computer disks of the transcripts in a locked file cabinet in the researcher's locked office.

CAN YOUR TAKING PART IN THE STUDY END EARLY?

You are asked to take part in only one interview. You may decide to stop taking part in the interview once it begins. You will not be treated differently if you decide to stop taking part in

the interview. You can ask to have all the information that can be identified as yours returned to you, removed from the research records, or destroyed.

PARTICIPATION IN OTHER RESEARCH STUDY

You may take part in this study if you are currently involved in another research study.

WHAT YOU WILL RECEIVE

If you complete 15 minutes of the interview you will receive $5, 30 minutes you will receive $10 and 60 minutes you will receive $15. You will receive $20 as a token of appreciation for taking part in the interview for 80 minutes or the entire interview.

WHAT IF YOU HAVE QUESTIONS ABOUT THIS STUDY?

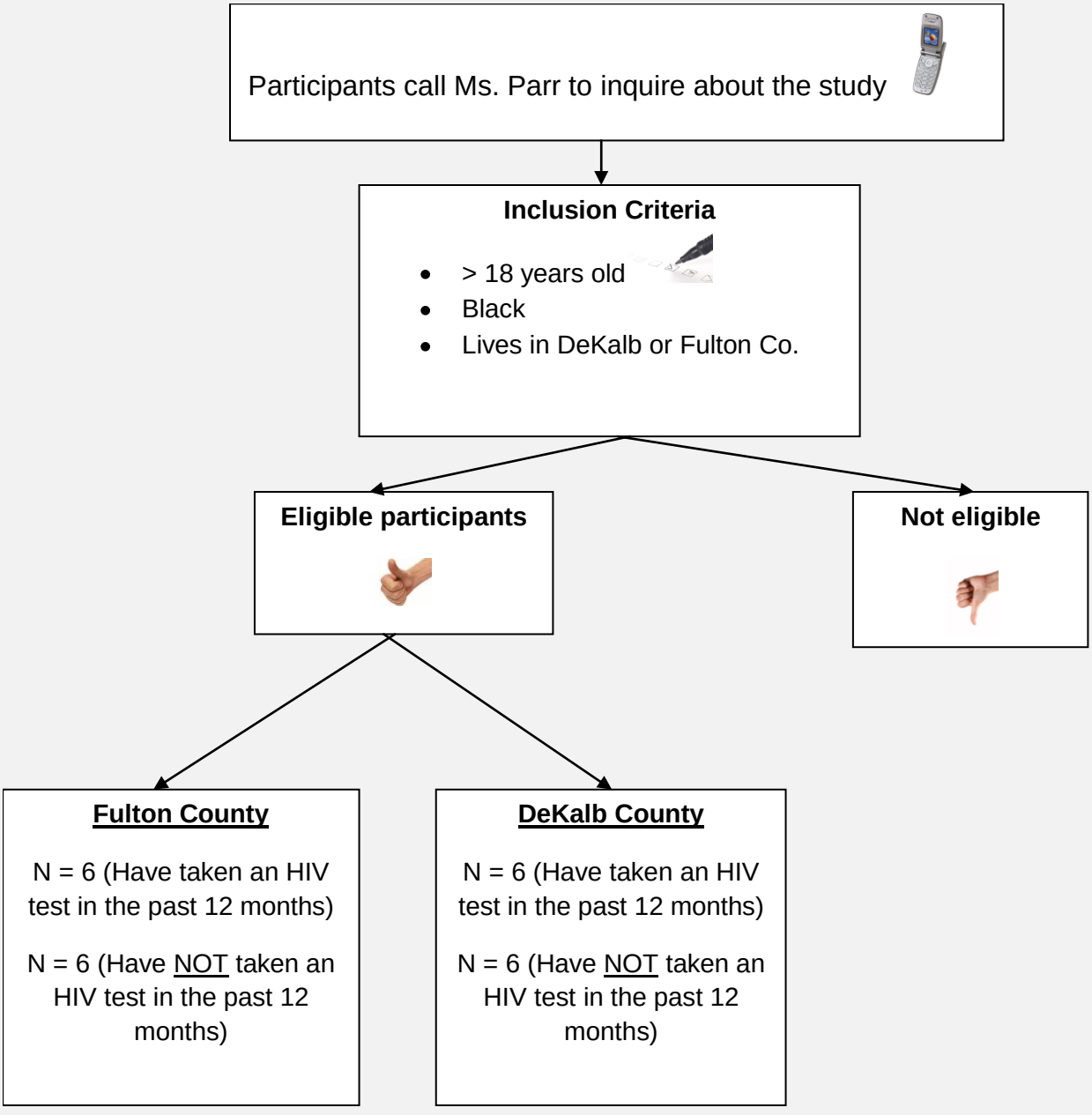
Please ask any questions that might come to mind now. Later, if you have questions, suggestions or concerns about this study please contact the investigator, Tiffany Parr at 404-822-2366. We will give you a copy of this consent form to take with you.

WHAT IF YOU HAVE QUESTIONS CONCERNING YOUR RIGHTS AS A PARTICIPANT IN THIS STUDY?

Additional questions or problems regarding your rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 629 Boyd Graduate Studies Research Center, Athens, Georgia 30602; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu.

APPENDIX B

ELIGIBILITY FLOW CHART (SPECIFIC AIM 3)



APPENDIX C

INTERVIEW MANUAL (SPECIFIC AIM 3)

HIV Testing Interview Guide

IR: Interviewer (Tiffany Parr)

IE: Interviewee

[Interviewer – (before participants enter room) Put snacks and water on the table for participant.]

[*Interviewer: Read the introduction*.]

Introduction

IR: Welcome and thank you very much for agreeing to participate in this interview. My name is Tiffany, and my role is to guide our conversation today. I would like to hear your honest opinions about the topics we discuss. There are no right or wrong answers to the questions I'm going to ask. So please relax and enjoy our conversation. As you know this interview will take about 1 hour and 20 minutes. I have provided you with water and snacks if you get hungry or thirsty. Please feel free to help yourself. After you have completed this interview, you will receive $20 in cash for your time.

You have been invited to participate in this interview because I need your help to better understand what Black men have to say about HIV testing and what may keep them from getting tested for HIV. During our discussion we will be discussing issues concerning your HIV testing experience, thoughts about HIV testing, and HIV testing sites in your community.

First, I would like to hear about what you know and think about HIV testing. Second, I would like to know your reasons for getting or not getting HIV testing. Finally, I would like to find out where people in your neighborhood can receive a HIV test.

Before we get started on our discussion, there are just a few things I'd like to point out. I am audio taping this session so I can listen to what you have to say and not worry about taking notes. The tapes help us in writing our reports and are used for this purpose only. Everything you have to say will be kept secure and anything that is reported will be done without names or identifiers. In other words, no one who reads the final report will know or be able to figure out that you participated in this study. Also, please remember that you can choose not to respond to a question at any time and that your participation in this study is completely voluntary.

IR: First I would like to begin by reading over a consent form. This form tells you about the study and about your rights as a participant in this study. Let's both follow along as I read it aloud. If you would prefer to read it to yourself just let me know and I will give you time to read it to yourself.

Collect the signed forms.

IR: Do you have any questions before we begin?

[Interviewer: Begin session with warm up.]

IR: Let's begin by finding out a little bit about each other.

IR: If money was not an issue and you had one day to do anything you wanted to do what would you do?

IR: (After participant answers then I answer) I would take a plane to a country that has beautiful beaches and relax all day beside the beach while eating seafood.

IR: Who is an important person in your life? Why?

IR: (After participant answers then I answer) My mother has been there for me through bad and good. She has believed in me even when I may not believe in myself.

IR: I am glad we were able to learn a little more about each other before beginning. Let's change gears so I can learn from you.

Perception of HIV testing

IR: If you are sick or do not feel well where do you usually go to be seen by a doctor?

IR: How do people find out if they have HIV or AIDS?

IR: What do you think of when you hear HIV testing?

IR: What do you think about the person who gets a HIV test once a year?

IR: Please put yourself in the situation.

It is almost 5:00 in the evening and you had a rough day so you want to relax and have a drink at the bar. You call one of your male friends to see if he wants to meet you at the bar and he says "Oh no problem I need to chill too but I might run a little late because I just heard about this free HIV testing spot in the neighborhood and I wanted to get tested before it closes. However, after that I'll come pass so I'll make it around 5:45pm."

IR: What is going through your head when you hang up with your friend?

IR: Why do you think it is embarrassing to some people to go get a HIV test?

IR: What would make a person (specifically male) get a HIV test?

IR: What encourages Black men to get tested for HIV?

IR: What discourages Black men from getting a HIV testing?

Availability of HIV test

IR: How would someone in your neighborhood know where to get a HIV test?

IR: Where would your neighbor get a HIV test?

Accessibility of HIV test

IR: If there was a HIV testing center 30 minutes from your house, how would you get to that facility?

IR: How do you think your neighbors would get to that HIV testing center?

IR: What keeps you from going there to get tested for HIV?

IR: Would you rather get tested for HIV in your neighborhood or somewhere else? Why?

Acceptability of HIV test

IR: What would prevent you from getting a HIV test?

IR: Where would you feel most comfortable to get a HIV test? Why?

IR: Where would you feel the most uncomfortable to get a HIV test? Why?

IR: Why do you think it is hard for a Black male to get a HIV test?

HIV testing

IR: Have you been tested for HIV?

IR: When were you tested?

Personal experience: **Participant that received a HIV test**

IR: Tell me about your last experience receiving a HIV test?

Probe: Where did you get it? What were some reasons that made you get it? How did you feel when you were awaiting your results? What type of HIV test did you receive: blood or oral rapid test?

IR: What test would you prefer, oral or blood? Why?

Personal experience: **Participant that has not received a HIV test**

IR: Tell me about your reasons for not getting tested for HIV?

IR: If there was a center that provided an oral rapid HIV testing in your neighborhood, what would prevent you from going to that center and receiving the HIV test?

IR: If there was a center that provided an oral rapid HIV testing in your neighborhood, what would help you to get a HIV test?

Conclusion question:

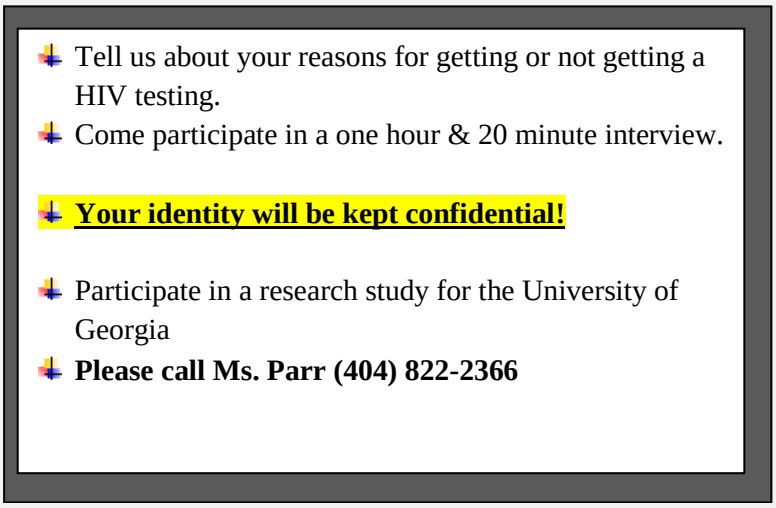
IR: If you were the Director of a HIV testing facility in your neighborhood, how would you increase HIV testing among Black males in the community?

APPENDIX D

RECRUITMENT CARD (SPECIFIC AIM 3)

Front of Recruitment Card

Back of Recruitment Card



APPENDIX E

RECRUITMENT FLYER (SPECIFIC AIM 3)

TELL US WHAT YOU THINK ABOUT HIV TESTING

✓Are you a **Black Male**

<u>and</u>

✓**18 years and older**

<u>and</u>

✓Live in **Fulton** OR **DeKalb Counties**

✓Willing to take part in an **in-person interview**

(it will take one hour and 20 minutes)

Participate in a research study by The University of Georgia

If you answered **YES to <u>all</u>** these questions & want to receive up to $20 for your time

please call:

Ms. Parr (404) 822-2366

APPENDIX F

RECRUITMENT PHONE AND SCREENING SCRIPT (SPECIFIC AIM 3)

IR: Interviewer

IE: Interviewee

IR: Hello, my name is Tiffany and I'm doing a research study under Dr. Christopher Whalen, in the Department of Epidemiology in the University of Georgia. I would like to interview Black males to learn more about HIV testing and things that may affect Black males' decision to get tested or not get tested for HIV. The interview should take approximately one hour with an additional 20 minutes at the beginning to go through the consenting process. Therefore, it would approximately take a total of 80 minutes of your time. I would interview you at a local public library in your community in a private study room so others do not hear our conversation. You will be compensated $20 for your time. The interviews will be face-to-face. I will be asking about your experiences with HIV testing and your reasons for seeking or not seeking HIV testing.

IR: Are you still interested to participate in the interview?

IE: Yes

IR: I would like to ask you some questions to determine if you might qualify for this study. This should only take 2 minutes. You may stop this interview at any time. If you qualify for this study, you will be asked to participate in the 80 minute interview. If you do not qualify for this

study, the information you give me today will be destroyed immediately. Do I have your permission to proceed?

IE: No

IR: Okay, well thank you for calling to learn more about this study and for the time you gave me thus far. Have a great day.

IR: Are you a Black male?

IR: How old are you?

IR: What county do you currently live in?

IR: Have you been tested for HIV in the past 10 years?

IR: Thank you for answering my questions today. You do/do not qualify to participate in this research study.

(If qualified to participate)

IR: If you're interested to participate, I would like to arrange a convenient place/time to meet to discuss the study and obtain your consent to participate. Are you interested in participating in this study?

IR: What day and time are usually best for me to interview you at a local library in your community?

IR: I will schedule us to meet at _____ local library in a confidential private study room for us to have the interview.

IR: Would you be able to make it to this location at _____am or pm?

IR: I will call the local library in your area to hold a private study room for us. Please provide me with a phone number or email address I can reach you. I will call or email you tomorrow to confirm our interview time and day. If you do not wish to provide me with a phone number or email address please call me back tomorrow to confirm your time to meet with me.

IR: Do you have any questions for me?

IR: If you have any questions regarding this study, please call me at this same number or email me at tstudy@gmail.com

IR: If you have any questions or problems about your rights as a research participant, please call the Chairperson, Institutional Review Board, University of Georgia at 706-542-3199.

After confirming meeting logistics, thank him for his time and end the call.

APPENDIX G

QUESTIONNAIRE (SPECIFIC AIM 2)

6306

Access To Healthcare Among Black Men in DeKalb and Fulton Counties, Georgia

ID

This questionnaire is Confidential

Home Street Address:

City: **State:** **Zip Code:**

Home Cross-Street 1: **Home Cross-Street 2:**

1. What County do you live in? ○ DeKalb ○ Fulton

2. How old are you?

3. What is the highest grade you completed?

○ < 9th ○ 10th ○ 11th ○ 12th ○ GED ○ Some college or AA ○ Bachelor or higher

4. Are you currently working? ○ No ○ Yes

5. How much money do you make monthly?

○ No income ○ 1-300 ○ 301-500 ○ 501-700 ○ 701-1000 ○ 1001-1500 ○ >1501

6. Are you a welfare recipient? ○ No ○ Yes

7. Are you currently homeless? ○ No ○ Yes

8. Do you own or have a vehicle? ○ No ○ Yes

9. How do you get around most of the time?

○ Car ○ Bus ○ Walk ○ Bike ○ Taxi ○ Get rides with friends/family

10. Do you have a regular doctor? ○ No ○ Yes

11. Where have you had most of your doctor visits?

○ Private doctor office ○ Emergency room ○ Jail/Prison ○ Urgent care clinic ○ STD Clinic

12. Do you have health insurance? ○ No ○ Yes

Page 1 of 1

6308

Access To Healthcare Among Black Men in DeKalb and Fulton Counties, Georgia

ID ☐☐☐

13. What type of health insurance do you have?

○ Private ○ Medicaid ○ Medicare ○ Public Assistance ○ No health insurance

14. Have you ever been tested for HIV? ○ No ○ Yes

15. Where did you get your last HIV test?

○ Never taken an HIV test
○ Private doctor office
○ Emergency room
○ Homeless shelter
○ Urgent care clinic
○ Hospital out patient
○ School clinic
○ STD/HIV Clinic
○ Jail or Prison
○ Drug/Alcohol center
○ Hospital:Inpatient
○ Other (Specify)_____

16. Have you been tested for HIV in the past 12 months? ○ No ○ Yes

17. Where did you get your HIV test in the past 12 monthst?

○ Never taken an HIV test
○ Private doctor office
○ Emergency room
○ Homeless shelter
○ Urgent care clinic
○ Hospital out patient
○ School clinic
○ STD/HIV Clinic
○ Jail or Prison
○ Drug/Alcohol center
○ Hospital:Inpatient
○ Other (Specify)_____

18. What is your HIV status?

○ Positive ○ Negative ○ I don't know ○ I don't want to share

19. Have you ever had a sexually transmitted disease test? ○ No ○ Yes

20. Where did you get your tested for a sexually transmitted disease?

○ Never taken an STD test
○ Private doctor office
○ Emergency room
○ Homeless shelter
○ Urgent care clinic
○ Hospital out patient
○ School clinic
○ STD/HIV Clinic
○ Jail or Prison
○ Drug/Alcohol center
○ Hospital:Inpatient
○ Other (Specify)

21. I have sex with:

○ Women ○ Men ○ Women and Men ○ Transgender individuals

22. Have you ever been arrested? ○ No ○ Yes

23. Ever served time in a federal or state penitentiary? ○ No ○ Yes

24. Have you ever been in a drug/alcohol treatment center? ○ No ○ Yes

25. How likely is it that you are infected with HIV today?

○ No chance of it ○ Very unlikely ○ Unlikely ○ Likely ○ Very likely

26. Getting tested for HIV helps people feel better.

○ Strongly Agree ○ Agree ○ undecided ○ Disagree ○ Strongly Disagree

27. Getting an HIV test prevents people from getting HIV.

○ Strongly Agree ○ Agree ○ Undecided ○ Disagree ○ Strongly Disagree

28. People in my life would not talk to me if I got HIV.

○ Strongly Agree ○ Agree ○ Undecided ○ Disagree ○ Strongly Disagree

29. People with HIV should hide it from others.

○ Strongly Agree ○ Agree ○ Undecided ○ Disagree ○ Strongly Disagree

30. I would rather not know if I have HIV.

○ Strongly Agree ○ Agree ○ Undecided ○ Disagree ○ Strongly Disagree

31. People who have HIV are dirty.

○ Strongly Agree ○ Agree ○ Undecided ○ Disagree ○ Strongly Disagree

32. People who have HIV should be ashamed.

○ Strongly Agree ○ Agree ○ Undecided ○ Disagree ○ Strongly Disagree

33. A person with HIV deserves to be punished.

○ Strongly Agree ○ Agree ○ Undecided ○ Disagree ○ Strongly Disagree

34. People who have HIV should be isolated.

○ Strongly Agree ○ Agree ○ Undecided ○ Disagree ○ Strongly Disagree

Access To Healthcare Among Black Men in DeKalb and Fulton Counties, Georgia

ID

35. I don't want to be friends with someone who has HIV.

○ Strongly Agree ○ Agree ○ Undecided ○ Disagree ○ Strongly Disagree

36. Most men with HIV are having sex with other men.

○ Strongly Agree ○ Agree ○ Undecided ○ Disagree ○ Strongly Disagree

37. Only men having sex with men need an HIV test.

○ Strongly Agree ○ Agree ○ Undecided ○ Disagree ○ Strongly Disagree

38. If a man gets an HIV test he is probably gay.

○ Strongly Agree ○ Agree ○ Undecided ○ Disagree ○ Strongly Disagree

Thank you for taking the time to complete this questionnaire!