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Factors Associated with HIV Among Heterosexual African American Adults Aged 50 Years and Older in Ten ZIP Codes of Atlanta, Georgia, 2005-2011

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FACTORS ASSOCIATED WITH HIV AMONG HETEROSEXUAL

AFRICAN AMERICAN ADULTS AGED 50 YEARS AND OLDER

IN TEN ZIP CODES OF ATLANTA, GEORGIA, 2005-2011

by

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ABSTRACT

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**Factors associated with HIV among Heterosexual African American adults aged 50
years and older in ten ZIP codes of Atlanta, Georgia, 2005-2011**
(Under the direction of Sheryl Strasser, Ph.D.)

INTRODUCTION: The fastest growing segment of the U.S. population is among
individuals aged 50 and older. However, advanced age is not protective against HIV.

AIM: The purpose of this study is to examine individual characteristics (gender, age,
education) as well as environmental and behavioral factors (doctor visits and IDU) that
may be linked with HIV status among older heterosexual African American adults. The
factors associated with HIV status that were examined include education level, IDU
within the last six months, non-injected drugs that were used within the last six months
and the length of time since the last doctor visit.

METHODS: The original study used participant-driven sampling to identify seeds in
high risk zip codes within the City of Atlanta to complete questionnaire and provide
biospecimens. This study focuses on the interviews and test results of participants ages 50
and older. Associations of demographic characteristics, behavioral risk factors and HIV
status were analyzed using Pearson chi-square, univariatae, and multivariate tests.

RESULTS: African Americans who have injected drugs within the last six months are
more likely to be HIV positive than those that have not injected drugs in the last six
months.

DISCUSSION: Results of this study reveal that there are unique patterns of risk taking
behavior among older adults. These findings can provide potential intervention
opportunities that may prevent HIV transmission among this vulnerable, increasing
segment of the population.

INDEX WORDS: HIV, Atlanta, African American, Heterosexual, Older Adults

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CHAPTER I

INTRODUCTION

Since the very first case of acquired immunodeficiency syndrome (AIDS) in 1981, the Human Immunodeficiency Virus (HIV) epidemic has continued to spread across the United States (U.S.) and the world. In the 1980s the number of AIDS cases increased rapidly, peaked in 1992, before stabilizing in 1998. Today it is estimated that over 1.1 million people in the U.S. that are over the age of 13 are living with the HIV infection and over 200,000 of those people are completely unaware of their infection (Centers for Disease Control (CDC), 2012a). Annually there are approximately 56,000 new HIV infections occurring (Lansky et al., 2010).

The fastest growing segment of the U.S. population is those that are 50 years of age and older. The Baby Boom population (ages 46 to 64) in 2010 will begin aging into the 65 and older ages in coming years, which indicates that future growth of the older population is both highly probable and unprecedented in the United States (U.S. Census Bureau & Public Information Staff, 2011). Advanced age is not protective against HIV. In 2005, 15% of new HIV/AIDS diagnoses were from people aged 50 and older and by the end of 2005 this age group represented close to 30% of the total U.S. population

living with AIDS (CDC, 2007a). When highly active antiretroviral therapy (HAART) became the standard of care in 1996 there was a substantial increase in survival after AIDS diagnosis, compared to earlier years. By 2015, it is estimated that one-half of the individuals in the U.S. with HIV will be older than age 50 (Greene, Justice, Lampiris, & Valcour, 2013). In the U.S., the rates of HIV/AIDS among persons 50 and older are 12 times as high among African Americans and 5 times as high among Hispanics compared with Whites (CDC, 2008a). Nevertheless, very little research has been completed to study this aging population and their sexual risk-taking behaviors.

When HIV infections are broken down by risk groups, the most affected population is gay, bisexual, and other men who have sex with men (MSM), which accounted for 63% of all new infections (CDC, 2012b). The next high risk groups are heterosexuals accounting for 25% of new HIV infections and injection drug users (IDU) accounting for 8% of new HIV infections. When broken down by ethnicity, African Americans continue to experience a disproportionate burden of HIV, compared with other ethnicities, followed by Hispanics. African Americans represent approximately 12% of the U.S. population, but accounted for an estimated 44% of new HIV infections in 2010, while Hispanics represent 16% of the population and accounted for 21% of new HIV infections (CDC, 2012b). When combining risk groups, the effect of HIV can be seen even more severely. In 2010, African American gay, bisexual and other MSM represented an estimated 72% of new infections among all African American men and 36% of new HIV infections among all MSM (CDC, 2013a).

Heterosexually transmitted HIV infection rates are disproportionately high among African Americans and is influenced by sexual network characteristics, including sexual partnership mixing patterns among subpopulations with different prevalence's of infection (Doherty, Schoenbach, & Adimora, 2009). African American women accounted for 29% of the estimated new HIV infections, which is mostly attributed to heterosexual sex (CDC, 2013a). A study completed by Ferguson, Quinn, Eng, & Sandelowski showed how a gender imbalance of more women than men allows men to have multiple sex partners at the same time, placing women at an increased risk for obtaining HIV (2006). It is also well known that African Americans tend to date mostly within their own race thereby increasing their risk of HIV infection.

Unfortunately, many African Americans have a low level of perceived risk or fear of discrimination and stigmatization and therefore do not get tested for HIV. One study found that two thirds of individuals testing positive for HIV and 87% of individuals testing negative assessed their own HIV risk as zero or low and their condom use was low, even among high-risk individuals (Nunn et al., 2011). A direct effect of African Americans perception of low risk is the high number of individuals that are unaware of their HIV status causing them to pass their infection on to others.

As larger numbers of males and females reach age 50 years and over, it becomes increasingly important to understand this population as well as the implications population aging has for various family, social, and economic aspects of society (U.S. Census Bureau & Public Information Staff, 2011). The aim of this study is to look at the

different factors associated with HIV among heterosexual African American men and women living in ten ZIP codes of Atlanta, GA that are 50 years and older. The research questions that will be addressed in this study are:

1. Is education level associated with HIV status?

    Null hypothesis: HIV status is not associated with educational level.

    Alternate hypothesis: HIV status is associated with educational level.

2. Does IDU within the last six months associate with HIV status?

    Null hypothesis: HIV status is not associated with IDU within the last six months.

    Alternate hypothesis: HIV status is associated with IDU within the last six months.

3. Does non-injected drug use within the last six months associate with HIV status?

    Null hypothesis: HIV status is not associated with non-injected drug use within the last six months.

    Alternate hypothesis: HIV status is associated with non-injected drug use within the last six months.

4. Is the length of time since last doctor visit associated with HIV status?

> Null hypothesis: HIV status is not associated with timeliness of last doctor visit.

> Alternate hypothesis: HIV status is associated with the timeliness of the last doctor visit.

The purpose of examining personal characteristics, health taking behavior, and patterns of risk can shed light on how public health professionals may be able to prevent HIV transmission among older adults. Little research has been dedicated to this rapidly growing segment of the US population. By developing a better understanding of the epidemiology of HIV in older adults within an urban setting and their risk taking behaviors we can move toward reducing HIV incidence, increasing education and access to care, optimizing health outcomes, and reducing HIV-related health disparities (The White House Office of National AIDS Policy, 2010). Additional research will be needed to determine what preventive measures work best for this particular population.

CHAPTER II

LITERATURE REVIEW

The cost of new HIV infections in the U.S. is substantial. The total lifetime direct medical cost among persons of all ages in 2008 in the United States for HIV was $12.6 billion (Owusu-Edusei et al., 2013). In 2002, overall healthcare costs associated with HIV care was estimated to be $36.4 billion, including $6.7 billion in direct medical costs and $29.7 billion in productivity losses (Hutchinson et al., 2006). Productivity losses far surpass direct medical costs and are disproportionately borne by minority races/ethnicities (Hutchinson et al., 2006). The U.S. currently provides more than $19 billion in annual funding for domestic HIV prevention, care, and research to assist in prevention efforts (The White House Office of National AIDS Policy, 2010).

The most common ways for HIV to be transmitted is through anal and vaginal sexual intercourse and sharing injection drug equipment. For this reason, certain groups of a population are placed at a higher risk than others. In the U.S., the four main groups of individuals that are affected by HIV are African Americans, the youth, substance users, and gay, bisexual and other men who have sex with men (MSM).

Urban Environment

According to the U.S. Census Bureau, the South comprised the greatest proportion of the total population of African Americans, at 20 percent, with the State of Georgia being the fourth highest out of all 50 states, the District of Columbia and Puerto Rico (2011). The State of Georgia is ranked sixth highest in the nation for its cumulative reported number of AIDS cases through December 2009 (CDC, 2009). In 2010, there were 2,037 persons newly diagnosed with HIV or AIDS in Georgia (Georgia Department of Public Health, 2012). Socioeconomic issues, such as low income, poor education, geographic location, limited access to quality health care, and housing, increase the risk of HIV infection. People living in poverty tend to be clustered in certain neighborhoods rather than being evenly distributed across geographic areas (Bishaw, 2012).

One particular study in Atlanta examined the association between clustering effects and case distribution trends and population characteristics for 16,600 people residing in census tracts in Clayton, DeKalb, Fulton, and Gwinnett counties. They found that the HIV epidemic in Atlanta is concentrated in one large cluster characterized by poverty, MSM, and IDU. Sixty percent of prevalent HIV cases were identified in one large cluster with a prevalence rate of 1.34% compared to 0.32% outside the cluster (Hixson, Omer, del Rio, & Frew, 2011). HIV prevalence rates in urban poverty areas are inversely related to annual household income–the lower the income, the greater the HIV prevalence rate (Denning & DiNenno, 2013). This inverse relationship between HIV prevalence and socioeconomic status (SES) has been observed for various SES measures

examined, including: education, annual household income, poverty level, employment, and homeless status (Denning & DiNenno, 2013).

Urban poverty areas have a 2.1% HIV prevalence rate in the U.S. which exceeds the 1% cut-off that defines a generalized HIV epidemic and is similar to the rates found in several low-income countries that have generalized HIV epidemics (The Joint United Nations Programme on HIV/AIDS (UNAIDS), 2008). According to the U.S. Census Bureau, 46% of African Americans live in poverty areas compared to only 10% of Whites (Bishaw, 2012). The HIV prevalence rate for African Americans is more than 8 times the rate for Whites in the U.S. (CDC, 2008b). This is higher than any other race and puts African Americans at a greater disadvantage when it comes to educating and protecting themselves from HIV infection.

Education

Consistent correlations between SES and ethnicity in light of HIV have been demonstrated. Despite dramatic changes, large gaps remain when minority education attainment is compared to that of Whites (American Psychological Association (APA), n.d.). African Americans and Latinos are more likely to attend high-poverty schools than Asian Americans and Whites (National Center for Education Statistics (NCES), 2008). Low SES and its correlates, such as lower education, poverty, and poor health, are risk factors for many of the problems that plague communities and are steadily increasing in the U.S. and globally (APA, n.d.). In 2005, the high school dropout rate of Latinos was

highest, followed by those of African Americans and American Indians/Alaska Natives (NCES, 2008).

Doctor Visits

In a 2007 national study of 3,005 U.S. adults by Lindau, et al. it was found that many older adults are not only sexually active but choose not to discuss their sexual behaviors and problems with their physician. Most older adults do not get tested for HIV on a routine basis and physicians tend not to question their sexual behaviors (Stall & Catania, 1994). Many physicians and other health professionals fail to screen the older population for HIV thoroughly because they are uncomfortable discussing sexual histories with older adults (Oberne, 2009).

Due to the misperceptions of low risk, the older population are often overlooked and not educated about HIV and safer sex, which has caused a steady increase in the number of people aged 50 years and older that are not only living with HIV/AIDS, but becoming newly infected. Physicians are a very important source in recognizing older patient's sexual behaviors and identifying their HIV status.

As people age they become more susceptible to other diseases and some of the signs and symptoms of HIV are often identified as something else or simply disregarded as being a part of getting older thereby causing the diagnosis of HIV to be delayed. Age is a major determinant of mortality for many diseases including HIV infection (Babiker, Peto, Porter, Walker, & Darbyshire, 2001). The prevalence of high-risk sexual behavior is reduced substantially after people become aware they are HIV positive (Marks, Crepaz,

Senterfitt, & Janssen, 2005). Mortality associated with HIV disease is higher during the first 6 months of treatment among older adults whose HIV status is detected in advanced stages, highlighting the need to improve both early access to HIV testing and earlier start of therapy (Spillane et al., 2012).

In a study of 3,003 California adults age 60 years and older it was found that African Americans were significantly less likely than Whites to see a doctor and to have a usual source of care, and were more likely to visit the emergency department (ED) (Kim, Ford, Chiriboga, & Sorkin, 2012). In a cross-sectional survey of 915 HIV-infected adults receiving care at 14 U.S. HIV clinics, racial disparities in patients' experience of access to care was observed; the disparities were explained by poor access at minority-serving clinics (Korthuis et al., 2008). In terms of those with disabilities, a nationally representative sample consisting of 85,015 adults age 65 and older found that despite having health insurance and a usual source of care, older adults with disabilities encountered greater economic difficulties in seeing a doctor than their counterparts without disabilities (Lee, Hasnain-Wynia, & Lau, 2012).

Injection Drug Use

Over 200,000 people living with HIV in the U.S. were infected through IDU. Although HIV incidence among IDUs has declined since the late 1980s, this group accounted for an estimated 15% of new HIV infections in 2006 (Hall et al., 2008). Sharing syringes and other injection paraphernalia is associated with the risk of transmitting HIV. Using sterile needles and syringes remains the only safest, most

effective way to limit HIV transmission (CDC, 2007b). Syringe exchange programs (SEPs) provide sterile needles and syringes to IDUs for free or in exchange for used needles; some also provide other supplies and referrals, as well as testing, vaccination, and medical services (Des Jarlais, McKnight, Goldblatt, & Purchase, 2009).

Unfortunately, 23.2% of HIV-infected patients had physicians with negative attitudes toward IDUs, which in most cases led to less than optimal care (Ding et al., 2005). The characteristics and needs of the older HIV-positive population are very diverse and vary sharply by exposure route (Crystal et al., 2003). Interventions need to be tailored to the needs of these distinct subpopulations, with an emphasis on development of supportive care interventions for older IDUs (Crystal et al., 2003).

Researchers have found that among older adults that use drugs, they are less likely to have had sex in the last month; however their sexual risk taking behaviors are very risky, especially among those that smoke crack (Kwiatkowski & Booth, 2003). The risk taking behaviors of men 50 years of age and older were riskier than women older than 50 years of age; however, users older than 60 years of age were no less risky than those in their 50s (Kwiatkowski & Booth, 2003). Results from the HIV Cost and Services Utilization Survey revealed that older IDUs with HIV/AIDS are a predominantly African American population with a particularly high concentration of disadvantages; only 11% were employed and 74% reported incomes of less than $10,000 (Crystal et al., 2003). Results from a 10-year prospective analysis and a 7 year analysis indicated that sexual risk factors for HIV infection are important in both female and male IDUs, which

underscore the need for HIV interventions among drug users that incorporate sexual risk reduction (Strathdee & Sherman, 2003).

Gender

Gender is an important variable in HIV research. Men, and more specifically gay, bisexual and other MSM, are more severely affected by HIV than women or any other group in the U.S. In 2010, MSM represented 78% of infections among all newly infected men, with White MSM accounting for an estimated 38% and African American men following closely behind with 36% (CDC, 2013c). Men aged 40 years and older had higher rates of HIV infection than men aged 18 to 39. One key issue is that many MSM are unaware of their HIV positive status and therefore do not receive proper medical care and spread the infection to others. By the end of 2010 MSM represented 48% of all deaths of persons with an AIDS diagnosis (CDC, 2013c).

In a national study on HIV response, it was found that a total of 82% of countries have policies in place to ensure that women have equal access to HIV-related services, however 14% of those reporting countries also had laws and policies in place that hinder their ability to deliver effective HIV programs for women (Carael, Marais, Polsky, & Mendoza, 2009). The study also found that about 80% of countries reported having included women as a specific sector in their multi-sectoral AIDS strategies or action frameworks. However, only slightly more than half (53%) of those countries reported having a budget attached to programs addressing women issues (Carael et al., 2009). One-half of HIV cases worldwide occur in women and young girls, with more than 75%

of those women living in Sub-Saharan Africa. While most countries have integrated women-related issues into their national HIV policies and strategic plans, other countries are lagging behind.

In 2009, the U.S. accounted for 23% of new HIV infections among women, with African American and Latina women being disproportionately affected compared to other races/ethnicities (Prejean et al., 2011). At the end of 2010, an estimated 25% of adults and adolescents aged 13 years or older living with a diagnosis of HIV in the U.S. were women (CDC, 2013b). The annual estimated rate of HIV diagnosis for African American women decreased significantly in all age groups except those aged 50 years and older, from 82.7 in 2001 to 67.0 in 2004, but remained 21 times that of White women (McDavid, Li, & Lee, 2006).

Age Dynamics

Common misperceptions are that older adults do not have sex and do not use drugs. However, the main causes of HIV infection among older adults has shifted from blood transfusions to heterosexual contact and needle sharing among IDUs. Heterosexual contact predominately affects women and minority groups, with more than 50% of HIV infections in older women being reportedly due to heterosexual transmission, while only 15% is due to IDU (Nguyen & Holodniy, 2008).

With the introduction of highly active antiretroviral therapy (HAART) in the mid-1990s, survival following HIV diagnosis increased dramatically and HIV infection has evolved from an acute disease process to being managed as a chronic medical condition

(Nguyen & Holodniy, 2008). This leaves a growing number of older adults to not only deal with the normal challenges of aging, but also the new challenge of living with HIV as they age.

Individuals age 50 and older may report less sexual activity when compared to other targeted risk groups for HIV, but nonetheless, they engage in other high risk behaviors that are conducive to HIV transmission. Research dedicated to the risk behavior patterns among older adults is critically important during the aging of American society. The purpose of this study is to examine risk taking behaviors among a sample of older adults living in an urban city.

Based upon the review of the literature, hypotheses, specific to individuals aged 50 and older, were developed as follows:

1. HIV is less common among heterosexual African Americans with higher education attainment.

2. Heterosexual African Americans who have injected drugs within the last six months are more likely to be HIV positive than those that have not injected drugs in the last six months.

3. Heterosexual African Americans who have used non-injecting drugs within the last six months are more likely to be HIV positive than those that have not injected drugs in the last six months.

4. Heterosexual African Americans that have not visited the doctor in over six months are more likely to be HIV positive than those that have visited the doctor within the last six months.

The methods and results are presented in Chapters 3 and 4 respectively.

CHAPTER III

METHODS AND PROCEDURES

Background

This study was conducted by examining secondary, de-identified interview and specimen data collected from a participant-driven sample of African Americans residing in ten ZIP codes of Atlanta, Georgia. Due to the nature of the study's research questions, cases from participants age 50 and older were selected to be analyzed.

Procedures

A research study, referred to as the *Geography Project,* funded by the U.S. National Institute on Drug Abuse, was developed and carried out (from 2005-2011) by Principal Investigator and Professor of Epidemiology at GSU School of Public Health, Dr. Richard Rothenberg. The purpose of this original research project was to examine the role of geography, networks, and risk in the transmission of HIV and other sexually transmitted diseases (STDs) in inner city neighborhoods of Atlanta. The goals of the *Geography Project* were to determine the behavioral, social, and geographic characteristics of those at risk due to drug use and sexual activity in high- and low burden HIV prevalence areas, as well as to evaluate the combined influence of those factors and

their dynamics on the prevalence and incidence of seven STDs, including HIV (Rencher, 2012).

Original Study Data Collection and Protection of Study Subjects

Participants for this study were selected from five ZIP codes of Atlanta, Georgia with high prevalence rates for HIV (30318, 30314, 30310, 30315, and 30308), and five ZIP codes with intermediate rates (30349, 30331, 30337, 30344, and 30311) adjacent to the five high prevalence ZIP codes. The five high prevalence ZIP codes represented 30% of reported AIDS cases in Fulton County, Georgia between 1998 and 2003. An initial six month period of ethnographic investigation was used to find three seed persons from each ZIP code who represented the characteristics of persons at risk due to their sexual activity or drug use and not known to each other. Each seed was interviewed and asked to name 10-12 contacts and to nominate one of them to be another seed in the chain. The process was repeated until three chains of three persons each and their contacts were formed in each ZIP code. Some contacts, but none of the seeds, may have overlapped (Rencher, 2012).

A standard questionnaire that included questions about sociodemographic, behavioral, medical, sexual, and drug-using factors; as well as information about their named contacts, such as geographic location, the nature of their relationship, and any shared sexual or drug using experiences was used to interview seed persons in each chain and some, but not all, of their named contacts (respondents). Furthermore, respondents were offered testing and counseling for seven STDs, including HIV. Those respondents

that tested positive were referred to the local health department for treatment. Interviews were repeated at annual intervals over a three year period from 2008 to 2011 and respondents were paid $20 for each interview (Rencher, 2012). The data used in the present analysis were obtained from the final interviews.

Informed consent was obtained in writing from all study respondents. The informed consent form was approved by the Institutional Review Board of Georgia State University and the research protocol was approved by the Institutional Review Boards of both Emory University and Georgia State University. Possible vulnerable populations identified were pregnant women and recent parolees. Pregnant women were informed of treatment risks for the conditions being tested and extra precautions were taken to ensure that parolees knew they could leave the study at any time and that the study was not related to their parole status (Rencher, 2012).

Key Study Variables for This Study

The key research questions that will be addressed in this study are:

1. Is education level associated with HIV status?

2. Does IDU within the last six months associate with HIV status?

3. Does non-injected drug use within the last six months associate with HIV status?

4. Is the length of time since last doctor visit associated with HIV status?

The study measures that were considered in the study were obtained from the demographic file. These included age, gender, race/ethnicity, education, sexual

orientation and marital status. The independent variables that were used included IDU in the last six months, non-injected drug use in the last six months and time frame since the last doctor visit. The dependent variable was HIV status.

Demographic Variables

i. *Age*

Age was calculated from the date of birth that was provided by participants during the original interview. It ranged from 18 to 75 with an average age of 36. For the purpose of this study, we focused only on those individuals whose age equaled 50 years or older.

ii. *Gender*

Gender was categorized as either being male, female or other. Other was treated as missing and excluded from this study population because the sample size was too small to analyze and it cannot be meaningfully interpreted. Combined they represented only 0.6% of the population.

iii. *Race/Ethnicity*

Possible answers were Black (African-American), Black (Caribbean), White, Hispanic (Black), Hispanic (White), Native American Indian/Alaskan Native, Asian/Pacific Islander, Mixed (Black/White), and Other. Responses were re-coded into four categories: African American (including Caribbean), White, Hispanic (including Black and White), and Other (all other categories). African Americans will represent 100% of the study population. There was only one Hispanic, zero Whites

and zero others, therefore they were treated as missing and excluded from this study population due to the small sample size. Combined they represented only 0.6% of the population.

iv. *Education*

Possible answers were none, elementary school (K-8), some high school (9-11), GED, high school graduate, some college or technical training, college graduate, and graduate work. Responses were re-coded into two categories: High school diploma or less and some college or more.

v. *Sexual Orientation*

Respondents were asked to identify their sexual orientation from a list of possible answers: Heterosexual (straight), bisexual, gay, lesbian, transgender, transsexual, and other. There was only two transgender and eight bisexuals, therefore they were treated as missing and excluded from this study population due to the small sample size. Combined they represented only 6% of the population. Heterosexuals will represent 100% of the study population.

vi. *Marital Status*

Possible answers were single (never married), married or common law, divorced, separated, and widowed. Responses were recoded into three categories: single, married or common law, and divorced, separated or widowed.

Independent Variables

i.   *IDU in Last 6 Months*

IDU was categorized as a "Yes" or "No" for at least one of the following drugs: Heroin and Amphetamines/Methamphetamines. Answers of "Not Asked", "Refused" or "Don't Know" were coded as not having injected drugs in the last six months.

ii.   *Non-injected Drug Use in Last 6 Months*

Non-injected drug use was categorized as a "Yes" or "No" for at least one of the following drugs: Marijuana, Crack and Powdered Cocaine. Answers of "Not Asked", "Refused" or "Don't Know" were coded as not having injected drugs in the last six months.

iii. *Doctor Visit*

Possible answers were less than 6 months ago, within the last 6 months to 1 year, within the last 1 to 5 years, within the last 5 to 10 years, more than 10 years ago, refused, and don't remember. Answers of Refused and Don't Remember were treated as missing since there was only one individual, which represented 0.6% of the population.

Dependent Variable

HIV Status

Dichotomous variables of HIV status are "Yes" or "No". For the present analysis, dichotomous variables of HIV status are "Yes" or "No". For the present analysis, answers of "Refused" or "Don't Know" were treated as missing.

HIV status was initially determined by the results of a saliva evaluation (Orasure®) administered during the interview. Positive results were then confirmed using the STAHRS assay (Serologic Testing Algorithm for Determining Recent HIV Seroconversion) and PCR testing. For the present analysis, those who were not tested or who had an indeterminate result were coded as HIV negative.

Statistical Analyses

IBM Statistical Package for the Social Sciences (SPSS) version 19 was used to truncate, clean, organize and analyze the data to make it suitable for this study. Descriptive analyses was conducted on the demographic variables such as age, gender, race, education, sexual orientation, and marital status and on the independent variables such as IDU in last six months, visiting a doctor and sharing works in the last six months. The mean and standard deviation (SD) were computed for the continuous variable of age while frequencies and percentages were computed for all other categorical variables. Pearson chi-square analyses were used to describe the associations between risk factors and HIV status. An alpha, or p-value, of $< .05$ was established as the cut point for statistical significance.

Univariate analyses were used to compare each independent variable with the dependent variable, HIV status. Associations were measured using odds ratios and significance was determined by 95% confidence intervals. Further univariate analyses were used to compare each demographic variable (gender, education, sexual orientation, and marital status) and the frequency of doctor visits with IDU as the dependent variable.

Associations were measured using odds ratios and significance was determined by 95% confidence intervals. Multivariate analyses were performed using logistic regression to control for the variables shown to have significant associations in the univariate analyses. Associations were determined by odds ratios and significance by 95% confidence intervals. This study was approved by the Georgia State University Institutional Review Board (IRB) on May 3, 2013.

CHAPTER IV

RESULTS

Descriptive Summary

A total of 927 interviews were included in the original dataset. Of those, 160 met the study eligibility which was: African American race/ethnic status, Heterosexual orientation, and age 50 years and older. Table 1 presents the demographic profile of the study sample. As shown, 109 (68.1%) were male, 51 (31.9%) were female. The mean age of participants was 55.11 with a standard deviation of 4.9. There were 122 (76.3%) adults with a high school diploma or less and 38 (23.8%) with some college education or more. There were 69 (43.1%) singles, 15 (9.4%) married or common law, and 76 (47.5%) divorced, widowed or separated. Finally, there were 7 (4.4%) HIV positive and 153 (95.6%) HIV negative.

Table 1
Demographic Profile of Study Sample

Overall N= 160	**N (%)**
Age (years)[a]	55.1 ± 4.9
Gender	
Male	109 (68.1)
Female	51 (31.9)
Education	
HS Diploma or less	122 (76.3)
Some college or more	38 (23.8)
Marital Status	
Single	69 (43.1)
Married or Common Law	15 (9.4)
Divorced/Separated/Widow	76 (47.5)
HIV Status	
HIV Negative	153 (95.6)
HIV Positive	7 (4.4)
Injection Drug Use in last 6 months	
No	142 (88.8)
Yes	18 (11.3)
Non-Injecting Drug Use in last 6 months	
No	21 (13.1)
Yes	139 (86.9)
Doctor Visit	
Less than 6 months	84 (52.5)
6 months to 1 year	42 (26.3)
1 to 5 years	25 (15.6)
5 to 10 years	8 (5.0)
More than 10 years	1 (0.6)

[a]Value for age is mean ± standard error.

Next, there were 18 (11.3%) IDU's and 139 (86.9%) non-injecting drug users.

Regarding the three independent risk-taking behavioral variables, only 18 (11.3%)

injected at least one of the two types of drugs (heroin or amphetamines) in the last six

months. One hundred and thirty-nine (86.9%) of the respondents reported that they used

at least one of the three types of non-injecting drugs (marijuana, crack, and powdered cocaine) in the last six months. Slightly more than half of the sample (84; 52.5%) had been to the doctor within the last six months; 42 (26.3%) visited the doctor within the last 6 months to 1 year; 25 (15.6%) went to the doctor within the last 1 to 5 years; 8 (5.0%) went to the doctor 5 to 10 years ago; and only 1 (0.6%) had not been to the doctor in over 10 years.

Analyses of each variable by HIV status revealed no significant associations among all variables with the exception of one (Table 2).

Table 2
HIV Status by Demography, Drug Use History and Frequency of Doctor Visits Among Heterosexual African Americans Aged 50 Years and Older

	HIV Positive N (%)	HIV Negative N (%)	p-value	X^2
Overall N=160	7 (4.4)	153 (95.6)		
Gender				
Male	3 (2.8)	106 (97.2)	0.142	2.152
Female	4 (7.8)	47 (92.2)		
Education				
HS Diploma or less	5 (4.1)	117 (95.9)	0.759	0.094
Some college or more	2 (5.3)	36 (94.7)		
Marital Status				
Single	5 (7.2)	64 (92.8)	0.273	2.598
Married or Common Law	0 (0.0)	15 (100.0)		
Divorced/Separated/Widow	2 (2.6)	74 (97.4)		
Injection Drug Use in last 6 months				
No	4 (2.8)	138 (97.2)	0.007	7.324
Yes	3 (16.7)	15 (83.3)		
Non-Injecting Drug Use in last 6 months				
No	1 (4.8)	20 (95.2)	0.926	0.009
Yes	6 (4.3)	133 (95.7)		
Doctor Visit				
Less than 6 months	4 (4.8)	80 (95.2)	0.671	2.355
6 months to 1 year	3 (7.1)	39 (92.9)		
1 to 5 years	0 (0.0)	25 (100.0)		
5 to 10 years	0 (0.0)	8 (100.0)		
More than 10 years	0 (0.0)	1 (100.0)		

There was a significant association observed between IDU in the last six months and HIV status (χ^2 (1, N=160) = 7.32, p < 0.01). The prevalence of HIV among women (7.8%) was more than twice the rate of men (2.8%) (χ^2 (1, N=160) = 2.15, p > 0.05). The prevalence of HIV among those with a high school diploma or less (4.1%) was about the

same as those with some college education or more (5.3%) (χ^2 (1, N=160) = 0.09, p > 0.05). Being married or common law (0%) had a protective affect against a positive HIV status (χ^2 (2, N=160) = 2.60, p > 0.05). The prevalence of HIV among non-injecting drug users (4.3%) was similar to the rate of those that did not use drugs (4.8%) (χ^2 (1, N=160) = 0.01, p > 0.05). Lastly, those that visited a doctor within the last six months (4.8%) were almost twice as likely to be HIV positive as compared to those that last visited a doctor six months to one year ago (7.1%) (χ^2 (4, N=160) = 2.36, p > 0.05).

Analyses of each variable by IDU in the last six months also revealed two significant associations among all variables (Table 3). There was a highly significant association observed between HIV Status and IDU in the last six months (χ^2 (1, N=160) = 7.32, p < 0.01). The prevalence of IDU among those that were single (8.7%) and divorced, separated or widowed (9.2%) were about one-third less the rate of those that were married or common law (33.3%) and this was also found to be significant (χ^2 (2, N=160) = 8.09, p < 0.05). IDU within the last six months by gender shows that the prevalence was nearly equal among males (11.9%) and females (9.8%) (χ^2 (1, N=160) = 0.16, p > 0.05). The prevalence of IDU among those with a high school diploma or less (9.8%) was almost half of those with some college education or more (15.8%) (χ^2 (1, N=160) = 1.03, p > 0.05). Approximately 12% of those that are non-injecting drug users had also injected drugs (4.8%) (χ^2 (1, N=160) = 1.02, p > 0.05).

Table 3
IDU History by Demography, HIV Status, Non-Injected Drug Use and Frequency of
Doctor Visits Among Heterosexual African Americans Aged 50 Years and Older

Overall N=160	Yes IDU N (%)	No IDU N (%)	p-value	X^2
	18 (11.3)	142 (88.8)		
Gender				
Male	13 (11.9)	96 (88.1)	0.692	0.157
Female	5 (9.8)	46 (90.2)		
Education				
HS Diploma or Less	12 (9.8)	110 (90.2)	0.310	1.029
Some college or more	6 (15.8)	32 (84.2)		
Marital Status				
Single	6 (8.7)	63 (91.3)	0.017*	8.094
Married or Common Law	5 (33.3)	10 (66.7)		
Divorced/Separated/Widow	7 (9.2)	69 (90.8)		
HIV Status				
No	15 (9.8)	138 (90.2)	0.007**	7.324
Yes	3 (42.9)	4 (57.1)		
Non-Injecting Drug Use in last 6 months				
No	1 (4.8)	20 (95.2)	0.313	1.019
Yes	17 (12.2)	122 (87.8)		
Doctor Visit				
Less than 6 months	14 (16.7)	70 (83.3)	0.141	6.904
6 months to 1 year	4 (9.5)	38 (90.5)		
1 to 5 years	0 (0.0)	25 (100.0)		
5 to 10 years	0 (0.0)	8 (100.0)		
More than 10 years	0 (0.0)	1 (100.0)		

*Statistically significant (p < .05).
**Highly statistically significant (p < .01).

The prevalence of IDU among those that have visited a doctor within the last six months

(16.7%) was about twice the rate of those that last visited a doctor six months to one year

ago (9.5%) (χ^2 (4, N=160) = 6.90, p > 0.05).

Analyses of each variable by non- injected drug use in the last six months also revealed two significant associations among all variables (Table 4). There was a significant association observed between non-injected drug use and last doctor visit (χ^2 (4, N=160) = 10.945, p < 0.05). The prevalence of non-injected drug use among those that had a high school diploma or less (90.2%) was greater than it was for those with some college education or more (76.3%) and this was also found to be significant (χ^2 (1, N=160) = 4.873, p < 0.05). Non- injected drug use within the last six months by gender shows that the prevalence was greater among females (94.1%) than males (83.5%) but only by a variation of 10% (χ^2 (1, N=160) = 3.444, p > 0.05). The prevalence of non-injected drug use was highest among those that were divorced, separated or widowed (90.8%) followed by those that were single (84.1%) and lastly by those that were married (80.0%) (χ^2 (2, N=160) = 2.123, p > 0.05). Approximately 94.4% of those that are IDU had also used non-injecting drugs (χ^2 (1, N=160) = 1.019, p > 0.05). The prevalence of non-injecting drug users among those with a positive HIV status was 85.7% (χ^2 (1, N=160) = 0.009, p > 0.05).

Table 4
Non-Injected Drug Use History by Demography, HIV Status and Frequency of Doctor Visits Among Heterosexual African Americans Aged 50 Years and Older

	Yes Non-IDU N (%)	No Non-IDU N (%)	p-value	X^2
Overall N=160	6 (4.3)	1 (4.8)		
Gender df1				
Male	91 (83.5)	18 (16.5)	0.063	3.444
Female	48 (94.1)	3 (5.9)		
Education df1				
HS Diploma or Less	110 (90.2)	12 (9.8)	0.027*	4.873
Some college or more	29 (76.3)	9 (23.7)		
Marital Status df2				
Single	58 (84.1)	11 (15.9)	0.346	2.123
Married or Common Law	12 (80.0)	3 (20.0)		
Divorced/Separated/Widow	69 (90.8)	7 (9.2)		
HIV Status df1				
No	133 (86.9)	20 (13.1)	0.926	0.009
Yes	6 (85.7)	1 (14.3)		
IDU in last 6 months df1				
No	122 (85.9)	20 (14.1)	0.313	1.019
Yes	17 (94.4)	1 (5.6)		
Doctor Visit df4				
Less than 6 months	67 (79.8)	17 (20.2)	0.027*	10.945
6 months to 1 year	41 (97.6)	1 (2.4)		
1 to 5 years	24 (96.0)	1 (4.0)		
5 to 10 years	6 (75.0)	2 (25.0)		
More than 10 years	1 (100.0)	0 (0.0)		

*Statistically significant (p < .05).

Univariate Analyses

The results of univariate analyses of the association between each of the examined independent variables and HIV status are shown in Table 5 (Unadjusted OR). The magnitude of association between the independent variables and outcome variable are quantified using the odds ratio from the logistic regression models. As shown, being an IDU was associated with increased odds of being HIV positive and was statistically significant. Being female, divorced/separated/widowed, having an increase in level of education, using non-injected drugs in the last six months and last visiting a doctor six months or longer was associated with increased odds of being HIV positive however none of these were found to be statistically significant.

The sample size of married or common law adults with HIV was zero, therefore no comparison could be made and it was removed from the analysis. The sample size of HIV positive adults that had not seen a doctor in over one year was zero, which does not allow for a comparison. Therefore the numbers were collapsed and added to the group of individuals that had been seen by the doctor in six months to one year. This was compared to the reference group of those that had visited the doctor within the last six months.

Table 5
*Effects of Demography, Drug Use History and Frequency of Doctor Visits on HIV
status Among Heterosexual African Americans Aged 50 Years and Older*

	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Gender		
Male	Reference group	Reference group
Female	3.01 (0.65 – 13.97)	6.00 (0.95 – 37.85)
Education		
HS Diploma or less	Reference group	Reference group
Some college or more	1.30 (0.24 – 6.99)	1.20 (0.16 – 8.75)
Marital Status[a]		
Single	Reference group	Reference group
Divorced/Separated/Widow	0.35 (0.07 - 1.84)	0.23 (0.03 - 1.63)
IDU in Last 6 Months		
No	Reference group	Reference group
Yes	6.90* (13.64 - 31.33)	21.84** (2.53 - 188.93)
Non-Injecting Drug Use in Last 6 Months		
No	Reference group	Reference group
Yes	0.90 (0.10 – 7.89)	0.28 (0.02 – 3.71)
Doctor Visit[b]		
Less than 6 months	Reference group	Reference group
6 months +	0.82 (0.18 - 3.80)	1.59 (0.27 – 9.27)

[a]Married or Common law was removed because the sample size was too small for a comparison to be made.
[b]Doctor visits of six months or greater were collapsed into one category because the sample size was zero for doctor visits of one or more years.
*Statistically significant ($p < .05$).
**Highly statistically significant ($p < .01$).

The results of univariate analyses of the association between each of the examined independent variables and IDU within the last six months are shown in Table 6 (Unadjusted OR). The magnitude of association between the independent variables and outcome variable are quantified using the odds ratio from the logistic regression models. As shown, being married or common law and last visit to the doctor being six months or

longer were both associated with increased odds of being HIV positive and were statistically significant. The sample size of HIV positive adults that had not seen a doctor in over one year was zero, which does not allow for a comparison. Therefore the numbers were collapsed and added to the group of individuals that had been seen by the doctor in six months to one year. This was compared to the reference group of those that had visited the doctor within the last six months.

Being female, divorced/separated/widowed, having some college education or more and using non-injected drugs within the last six months were all found to not be statistically significantly associated with IDU within the last six months. To determine whether the associations in the univariate model were not dependent of other covariates, multivariate logistic regression was performed with different categories of independent variables.

Table 6

Factors Associated with IDU Within the Last 6 Months Among Heterosexual African Americans Aged 50 Years and Older

	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Gender		
Male	Reference group	Reference group
Female	0.80 (0.27 - 2.39)	0.59 (0.18 – 1.96)
Education		
HS Diploma or less	Reference group	Reference group
Some college or more	1.72 (0.60 – 4.94)	1.69 (0.50 – 5.68)
Marital Status		
Single	Reference group	Reference group
Married or Common Law	5.25* (1.35 - 20.49)	7.41* (1.55 – 35.36)
Divorced/Separated/Widow	1.07 (0.34 – 3.34)	0.96 (0.28 – 3.32)
Non-Injecting Drug Use in Last 6 Months		
No	Reference group	Reference group
Yes	2.79 (0.35 – 22.12)	8.66 (0.83 - 90.23)
Doctor Visit[a]		
Less than 6 months	Reference group	Reference group
6 months +	0.28* (0.09 - 0.89)	0.19* (0.05 - 0.68)

[a]Doctor visits of six months or greater were collapsed into one category because the sample size was zero for doctor visits of one or more years.
*Statistically significant ($p < 0.05$).

The results of univariate analyses of the association between each of the examined independent variables and non-injecting drug users within the last six months are shown in Table 7 (Unadjusted OR). The magnitude of association between the independent variables and outcome variable are quantified using the odds ratio from the logistic regression models. As shown, higher education attainment and last visit to the doctor being six months or longer were both associated with increased odds of being HIV positive and were statistically significant. The sample size of HIV positive adults that had

not seen a doctor in over one year was very small, which does not allow for a comparison. Therefore the numbers were collapsed and added to the group of individuals that had been seen by the doctor in six months to one year. This was compared to the reference group of those that had visited the doctor within the last six months.

Being female, married or common law, divorced/separated/widowed, and an IDU within the last six months were all found to not be statistically significantly associated with non-injected drug users within the last six months. To determine whether the associations in the univariate model were not dependent of other covariates, multivariate logistic regression was performed with different categories of independent variables.

Table 7
Factors Associated with Non-Injected Drug Use Within the Last 6 Months Among
Heterosexual African Americans Aged 50 Years and Older

	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Gender		
Male	Reference group	Reference group
Female	3.17 (0.89 – 11.28)	3.24 (0.86 – 12.21)
Education		
HS Diploma or less	Reference group	Reference group
Some college or more	0.35* (0.14 – 0.92)	0.26* (0.08 – 0.84)
Marital Status		
Single	Reference group	Reference group
Married or Common Law	0.76 (0.18 – 3.14)	0.83 (0.13 – 5.18)
Divorced/Separated/Widow	1.87 (0.68 – 5.13)	2.56 (0.81 – 8.11)
IDU in Last 6 Months		
No	Reference group	Reference group
Yes	2.79 (0.35 – 22.12)	6.56 (0.74 – 58.50)
Doctor Visit[a]		
Less than 6 months	Reference group	Reference group
6 months +	4.57** (1.46 – 14.26)	5.43** (1.63 – 18.11)

[a]Doctor visits of six months or greater were collapsed into one category because the sample size was zero for doctor visits of one or more years.
*Statistically significant (p <0.05).
**Highly statistically significant (p <0.01).

Multivariate Analyses

As illustrated in Table 5 (Adjusted OR), IDU within the last six months was found to be highly statistically significantly associated with a positive HIV status while adjusting for the other variables. Being female, divorced/separated/widowed, having some college education or more, using non-injected drugs and last visit to the doctor being six months or longer were all not statistically significantly associated with being HIV positive.

The sample size of married or common law adults was zero and too small to analyze using multivariate analysis, therefore no comparison could be made. The sample size of adults that had not seen a doctor in over one year was zero; therefore the numbers were collapsed and added to the group of individuals that had been seen by the doctor in six months to one year. This was compared to the reference group of those that had visited the doctor within the last six months.

In Table 6 (Adjusted OR), the results among IDUs within the last six months demonstrated a statistically significant association for those that are married or common law and those whose last visit to the doctor was six months ago or longer. No association was found among those that were female, divorced/separated/widowed, had some college education or more, and used non-injecting drugs.

In Table 7 (Adjusted OR), the results among non-injecting drug users within the last six months demonstrated a statistically significant association for those that have some college education or more and a highly statistically significant association for those whose last visit to the doctor was six months ago or longer. No association was found among those that were female, married or common law, divorced/separated/widowed, and IDUs.

Based upon these findings the following hypothesis was accepted:

1. Heterosexual African Americans who have injected drugs within the last six months are more likely to be HIV positive than those that have not injected drugs in the last six months.

The following hypotheses were rejected:

1. HIV is less common among heterosexual African Americans with higher education attainment.

2. Heterosexual African Americans who have used non-injected drugs within the last six months are more likely to be HIV positive than those that have not used any non-injected drugs in the last six months.

3. Heterosexual African Americans that have not visited the doctor in over six months are more likely to be HIV positive than those that have visited the doctor within the last six months.

CHAPTER V

DISCUSSION AND CONCLUSION

African Americans continue to bear a disproportionate burden of HIV and it will only continue to get worse as the 50 and older population steadily increases over the next 10 years. Although there are many educational tools available to educate people on the prevention of HIV transmission, these materials are not being targeted at the older African American population. There is a desperate need for preventive measures to educate this population about how they can protect themselves and reduce their high risk sexual behaviors.

This study analyzed the association between various risk factors and HIV status among heterosexual African American adults aged 50 years and older in ten ZIP codes of Atlanta, Georgia with high HIV prevalence between 2005 and 2011. I hypothesized that having higher education attainment, not injecting drugs within the last six months, not using non-injected drugs within the last six months and visiting a doctor within the last six months would all be protective factors for persons residing in these geographic areas. The results of the logistic regression analyses comparing the variables with HIV status

show that, with one exception, no significant relationship existed between those variables and HIV status. Therefore, the hypothesis of this study is rejected, except to the extent that not injecting drugs within the last six months appears to be a protective factor in this population.

Univariate and multivariate analyses revealed that having some college education or more was associated with increased odds of being HIV positive compared to those with less than a high school diploma, however, this was found to not be statistically significant. This information correlates with prior studies analyzing this relationship, which found that those with less than a high school diploma would be more likely to be HIV positive than those with a high school diploma or GED (APA, n.d.). Typically the more education that is obtained, the less risky behaviors are taken.

The next hypothesis was that heterosexual African Americans who have injected drugs within the last six months are more likely to be HIV positive than those that have not injected drugs in the last six months. The results of both the univariate and multivariate analyses found this to be true and statistically significant. This also correlates with previous research, which shows the potential of IDUs to not only acquire HIV through IDU, but also to transmit HIV to the larger population through their engagement in sexual risk behavior (Salazar et al., 2007).

The subsequent hypothesis was that heterosexual African Americans who have used non-injected drugs in the last six months would be more likely to be HIV positive

than those that have not used any non-injected drugs in the last six months. Both

univariate and multivariate analyses did not find this relationship to be statistically

significant. Additional research would need to be completed to see if this is a common

occurrence for this particular population. If it is, then prevention measures would not

need to focus on non-injected drugs as much as IDU itself.

The last hypothesis was that African Americans that have not visited the doctor in

six months or longer are more likely to be HIV positive than those that have visited the

doctor within the last six months. Both univariate and multivariate analyses showed that

not visiting a doctor for six months or longer was associated with increased odds of being

HIV positive compared to those who had seen a doctor within the last six months,

however, this was found to not be statistically significant.

Previous research has shown that men are more likely to have last contacted a

doctor a year or more ago, as well as to have never contacted a doctor, as compared to

women (Schiller, Lucas, Ward, & Peregoy, 2012). Most physicians tend not to question

older adults sexual behaviors (Stall & Catania, 1994) and are uncomfortable discussing

sexual histories (Oberne, 2009). Therefore even if older adults are visiting the doctor they

may not be receiving the proper care or attention that they need due to a lack of

communication between doctors and patients. In April 2013, the U.S. Preventive Services

Task Force recommended that clinicians screen for HIV infection in adults aged 15 to 65

years and also older adults who are at increased risk. Patients are still able to opt-out of

the test however this will facilitate the process in making HIV screening a normal routine.

Strengths and Limitations

This study has a number of strengths that add to the reliability of its findings. The sample size contained 160 heterosexual African American adults over the age of 50, which is fairly representative of the population within the 10 ZIP codes of Atlanta, Georgia from which they were recruited. Another strength of this study is the approach that was used to identify the contacts within this population. Six months of preliminary research, including focus groups and surveys, was completed with the purpose of establishing a positive relationship with the communities involved. Having this approach not only improved follow up but also aided in the design of the final questionnaire. Moreover, the three seeds in each ZIP code were carefully chosen to be representative of and active in their communities. These seeds were not known to each other, which ensured that more contacts could be obtained thereby increasing the overall sample size.

One limitation of this study is recall bias as it pertains to the last time drugs were injected or used and the last time they visited a doctor. There could also be a potential self-reported bias in age and educational level. Another limitation of this study is the sample size for many of the selected variables. Although a large number of people were recruited for this study, the actual percentage that enrolled was less than 20%. The next potential limitation is that the time of diagnosis is unknown so we do not know how long

these older adults have been HIV positive. This makes it difficult to determine where the problem is actually occurring. HIV could have been acquired at a younger age, but manifested in older age or was never detected until older age.

An additional limitation of this study is that it only focused on heterosexual African Americans due to very small sample sizes for other races, therefore it was not possible to control for racial differences. This could be because African Americans are characteristically the majority race in high to intermediate HIV prevalent ZIP codes or that enough data for other races was not collected for this particular age range. The last limitation is that this data is not representative of all urban areas and therefore may not be generalizable to other populations.

Implications

Despite the lack of significant associations, the results of this study confirm the findings of Salazar et al., (2007) and others, that IDU not only accounts for a large percentage of HIV/AIDS cases, but is also a risky behavior leading to HIV transmission directly and indirectly. Interventions need to be tailored to the needs of these distinct subpopulations, with an emphasis on development of supportive care interventions for older IDUs (Crystal et al., 2003).

Recommendations

Additional research is needed to understand the HIV-related risk behaviors of this population, both sexual and drug use. Sex partnerships with IDU may play an important

role in heterosexual HIV transmission in areas with large IDU populations (Jenness, Neaigus, Hagan, Murrill, & Wendel, 2010). There is also a desperate need for preventive measures to educate this population about how they can protect themselves, reduce their high risk sexual behaviors and reduce HIV transmission. Physicians need to take the time to ask their older patients more questions about their sexual behaviors and injection history as well as screen them for HIV. If physicians are uncomfortable discussing sexual behaviors or positive diagnoses then educational materials are needed to help them understand how best to communicate with their patients. Being that this population will only continue to get larger in the future it is important to determine how HIV can be managed along with their other health issues and chronic diseases. Further research is needed to analyze the similarities and differences of the risk behaviors of this population within their geographically defined areas or clusters.

Conclusion

The association between various risk factors and HIV status was examined using results from a large study of 10 ZIP codes of Atlanta, Georgia gathered by Rothenberg and colleagues between 2005 and 2011. HIV status was either positive or negative. Select demographic characteristics (gender, education, and marital status) and three independent variables (IDU, non-injected drug use and last doctor visit) were analyzed. Those that were IDUs were shown to have a significant association with HIV status. Results of this study reveal that there are unique patterns of risk taking behavior among older adults.

These findings can provide potential intervention opportunities that may prevent HIV

transmission among this vulnerable, increasing segment of the population.

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