

5-1-2008

# Socioeconomic Determinants of HIV Status in Kenya

Kimberly Fletcher  
*Western Kentucky University*

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SOCIOECONOMIC DETERMINANTS OF HIV STATUS IN KENYA

A Thesis  
Presented to  
The Faculty of the Department of Sociology  
Western Kentucky University  
Bowling Green, KY

In Partial Fulfillment  
of the Requirements for the Degree  
Master of Arts

By  
Kimberly Fletcher

May 2008



Socioeconomic Determinants of HIV Status in Kenya

Date Recommended 5/9/08

John Musahie  
Director of Thesis

Stephen B. Groce

Jay Kelly

Richard J. Braken  
Director of Graduate Studies

5/30/2008  
Date

## ACKNOWLEDGMENTS

My family often gets comments about how different the four kids are. My older sister Val is the artist. Laura, my younger sister, is the rebellious genius. Then there's my 6' 4" "little" brother, Tim, who is into weird sports like water polo and amtgard (if that can be considered a sport), while his list of favorite books includes Plato's Republic. I tend to get tossed into the nerdy jock category.

I mention all of that about my siblings and me because I think it says a lot about my parents. They let each of us find our own path, even when they were not sure where it would lead. They have supported me through all of my crazy ideas, including running off to West Africa for a couple of years, and later pursuing a master's degree. They are still the first people I call when anything worth sharing happens, and, given the kick I get out of little things in life, it adds up to a lot of minutes. Thanks Mom and Dad!

There is one other person from the pre-graduate school days I should acknowledge, simply because this paper gives me my first chance to do so in writing. Dr. Greg Downey

was my undergraduate professor, advisor, mentor, and friend, and I am a different person for having known him. Greg showed us the world outside the university bubble and challenged us to step out into it. Without the opportunities he provided and the questions he asked, I don't think I ever would have engaged in research along the lines of this thesis.

In writing the actual paper, I could not have done without the three members of my committee. The beginnings of this thesis came out during one of many afternoon chats with Dr. Jerry Daday. He is incredible about taking an idea and finding a way to make it a feasible study. I also owe him a debt of gratitude for helping me through the analysis in this paper.

Dr. John Musalia, the committee's chair, always knew where to search for the perfect article. His research on family planning in Kenya provided the seeds for this thesis. I also want to thank him for giving me the freedom to make my own mistakes, the guidance not to get too far off course, and for bringing out the lifeboat when I started to drift away.

Thank you to Dr. Steve Groce for agreeing to be on a "bean counter's" committee. Your feedback and suggestions

made the whole process go much more smoothly. I really appreciate everything you did both for this thesis and during the year of coursework.

There are a number of other professors at Western Kentucky to whom I owe thanks. A year after studying under Dr. Joan Krenzin, I have forgotten more about English grammar and punctuation than many people will ever know. Dr. Doug Smith not only taught us about data analysis and interpretation, he was also always good for pointing out the lighter side in life. Dr. Holli Drummond was my introduction to quantitative methods, my biking partner, and the woman who destroyed us all in some Canadian card game about a plant and a cat I may never understand.

These next two professors were never officially teachers of mine, but that did not stop them from teaching me every chance they got. Drs. Faine and Bohlander, you two are fantastic. Dr. Faine, thank you for your ear, your library, your ideas, and the occasional swift kick in the butt. You may never know how important all of those were during the last two years. Dr. Bohlander, thank you for the stories, and the nuggets of wisdom that went along with them. I also appreciate your warning me about all the crazy people in Bowling Green, KY.

I would be remiss not to mention a small group of friends who have seen me through the writing process. Peter St. Pierre has probably read this thesis more times than I have. Thank you, Peter, for all of the suggestions and edits and for putting up with me when I went into "writing" (or any other) mode. Julie Shelton, grad school would not have been nearly the same experience without you. Thanks for the conversations, walks around campus, laughs, cries, and for being my id when I would not do it myself. Camille "Coach G" Gutierrez, I appreciate the constant reminders that had I gone for a master's in sports management instead, I would not need to write a thesis. Ginny "Fred" Frederick, thank you for your input on "the word." Finally, many thanks to the people who opened this acknowledgements section. Val, Laura, and Tim, you guys are the greatest.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS . . . . . iii

LIST OF TABLES . . . . . ix

ABSTRACT . . . . . x

CHAPTER 1 INTRODUCTION . . . . . 1

    Effects of HIV/AIDS . . . . . 1

    Women and HIV . . . . . 2

    Research Purpose and Questions . . . . . 3

CHAPTER 2 THEORY AND LITERATURE REVIEW . . . . . 6

    HIV/AIDS in Kenya . . . . . 8

    Theoretical Framework . . . . . 8

        The Health Belief Model . . . . . 9

        Structural Violence . . . . . 14

            Poverty . . . . . 19

            Education . . . . . 21

            Migrant Status . . . . . 25

            Ethnicity . . . . . 27

                Marginalized Ethnic Groups in Kenya.28

                Ethnic Groups with the Highest

                Degrees of Gender Inequality . . . . . 29

            Marital Status . . . . . 30

    Summary . . . . . 32

CHAPTER 3 METHODS AND MEASURES . . . . . 34

    Dependent Variable . . . . . 35

    Independent Variables . . . . . 35

        Wealth Quintile . . . . . 36

        Education . . . . . 36

Migrant Status . . . . .	37
Ethnicity . . . . .	37
Marital Status . . . . .	38
Control Variables . . . . .	39
Urban Versus Rural Location . . . . .	39
Age . . . . .	39
Measures . . . . .	40
About Logistic Regression . . . . .	40
Assumptions . . . . .	41
CHAPTER 4 RESULTS . . . . .	44
Model 1 . . . . .	48
Model 2 . . . . .	49
Model 3 . . . . .	52
CHAPTER 5 CONCLUSIONS AND DISCUSSION . . . . .	54
Theoretical Implications of Findings . . . . .	54
Practical Implications of Findings . . . . .	60
Limitations and Suggestions for Further Research . . . . .	61
REFERENCES . . . . .	65

LIST OF TABLES

Table

1. Distribution of Respondents' Social and Economic Characteristics . . . . .	45
2. Logistic Regression Analysis of Predictors of HIV Status . . . . .	50



SOCIOECONOMIC DETERMINANTS OF HIV STATUS IN KENYA

Kimberly Fletcher

May 2008

Directed by: John Musalia, Jerry Daday, and Steve Groce

Department of Sociology

Western Kentucky University

The spread of Human Immunodeficiency Virus (HIV) is one of the greatest threats to stability and development in Kenya. The country's infection rate is estimated between seven and eight percent, making it one of the highest in the world. Several studies have been done that examine subpopulations such as truck drivers, sex workers, and migrants. However, to date there is little research that examines who, across the country, is contracting HIV. Kenya's 2003 Demographic and Health Survey includes data that make it possible to determine which groups have the highest odds of being infected.

The question of who is contracting HIV in Kenya was examined using a structural violence framework. Proponents of the theory suggest that those marginalized for social or economic reasons in any society are at the highest risk of contracting infectious diseases. Because marginalization

occurs in different spheres and to different degrees for men and women, only women were included in the analysis.

Logistic regression was used in analyzing the data, with HIV status entered as the dependent variable. While a few of the hypotheses suggested by structural violence were supported by the data, the theory did not provide an adequate explanation for who is contracting the disease. However, the findings do have practical implications regarding who to target when trying to slow the spread of HIV in sub-Saharan Africa.

## **CHAPTER I INTRODUCTION**

The spread of Human Immunodeficiency Virus (HIV) is arguably the single greatest threat to stability and development in sub-Saharan Africa. The United Nations (UNAIDS 2000) estimates that more than 25 million people on the subcontinent live with the disease. In 2005 over three million people became newly infected, while almost 2.5 million died from its effects (UNAIDS 2007). HIV/AIDS is spreading rapidly, and it wreaks havoc on the individuals, households, communities, and nations where it is present.

### **Effects of HIV/AIDS**

While HIV can be asymptomatic, it increases a person's risk of contracting a number of opportunistic infections. Individuals who are HIV positive are more susceptible than the general population to pneumonia, staph infections, strep throat, herpes, and other less common diseases. If a family member does become sick, others in the household are expected to care for him or her. Household production can be significantly compromised when some members of working age are incapacitated and others are forced to care for those individuals (Baylies 2002).

When a significant proportion of a community or nation becomes infected with HIV, the damage is felt throughout the region. As a sexually transmitted disease, HIV and AIDS tend to affect young adults. Because people in their 20s and 30s are often the most productive in a community, their inability to work hurts the region economically (United Nations 2005a). Individuals in that age range may also have children who are still dependent on them. The disease eventually kills the adults, leaving behind a large population of orphans. While the orphans in African nations are usually well looked after, the continued spread of HIV may overstretch communities' abilities to care for them (Kamali, Seeley, Nunn, Kengeya-Kayondo, Ruberantwari, and Mulder 1996).

#### **Women and HIV**

When HIV first entered the global arena it was largely considered a male disease spread primarily through homosexual contact (Farmer 1999). As knowledge of the virus increased, however, its role in women's lives was better understood. Women are now thought to be more susceptible than men both biologically and socially. Women's mucosal surface in the vagina is more vulnerable, and there is a larger exposed surface area (Abdool Karim 1998; Rees 1998). They also tend to have less education,

access to formal employment opportunities, and social support than do men, which can increase their risk of exposure (Wojcicki 2005).

It is argued that in sub-Saharan Africa women are also more vulnerable than men because of their standing in the household. Men are more likely to have multiple sexual partners than are women, and women tend to have limited power in negotiating condom use (Campbell and Kelly 1995). As a result of these gender differences, the rate of new infections among women is rapidly rising, while the rate of new infections among men has plateaued (UNAIDS 2000). For these reasons this research will focus on women.

#### **Research Purpose and Questions**

Kenya has one of the highest HIV/AIDS rates in the world, with around 1.3 million infected citizens (UNAIDS 2006). Sexual transmission accounts for almost three-fourths of all cases, while around 23 percent contracted it from their mothers at birth. The remaining three to five percent became infected during blood transfusions (Demographic and Health...1999). The survey used in this study was given to 15-49 year old women so it is not likely any of the respondents contracted the virus from her mother during birth.

While there is information available on how HIV is being spread throughout the nation, there is limited data on who is actually contracting it. Much of the prior research in Kenya and other sub-Saharan countries have focused on knowledge of HIV/AIDS and risky sexual behaviors (e.g. Bauni and Jarabi 2000; Brockerhoff and Biddlecom 1999; Cameron, Witte, Lapinski, and Nzyuko 1999; Odhiambo 2003). Both of these indicators can be unreliable because of the potential for response bias. By using socioeconomic and demographic indicators as independent variables and HIV status as the dependent variable, this research avoids that problem.

The generally accepted, if not overtly stated, theory relating socioeconomic status to health in developing countries relies on the existence of structural violence. Structural violence, in this case, refers to inequality and injustice embedded within a society's structure. The argument is that the existence of social inequality inevitably leads to violence, physical or otherwise, against those on the bottom. An individual's increased odds of contracting infectious diseases is one form of this violence.

Studies that are conducted on individuals with HIV in developing countries often draw their samples from the

subpopulations they believe are most affected: poor women, migrant workers, and the uneducated. The populations are chosen based on the assumption that those are the people who are at the highest risk of infection because of their social positions. However, there is little conclusive data to suggest those people are most at risk.

Paul Farmer (1999) has done much research on the existence of structural violence and is one of the major proponents of the theory. As Janet Wojcicki points out, however,

The contexts that Farmer describes are industrialized ones or countries in Latin America or the Caribbean that have high[er] levels of income inequality...than some of the countries of sub-Saharan Africa. (2005:3)

Therefore, the theory may not hold in Kenya. This study fills both theoretical and empirical gaps in the existing literature. First, it helps in determining whether structural violence explains the spread of HIV in Kenya. Second, it makes known some of the socioeconomic and demographic indicators of HIV status in the country.

## CHAPTER II THEORY AND LITERATURE REVIEW

HIV/AIDS is a threat to social stability at every level. It disproportionately affects the most economically productive individuals in a community (Hamilton 1994; Panos Institute 1992), which hurts nations financially where the disease is prevalent. HIV/AIDS also causes social distress due to the demographics it attacks. The virus tends to kill the middle aged, presumably the most productive members of society, leaving a number of orphans looking to the elderly for care (Kamali et al. 1996). At the family level these deaths lead to a decreased income, which makes it difficult to meet basic needs such as food, education, and health care (Rajaraman, Russel, and Heymann 2006).

The highest HIV prevalence rates are found in poor countries, where it is already difficult to meet basic needs. Africa, for example, houses only 11 percent of the world's population, but in 2004 almost two-thirds of the known HIV-infected persons lived there (United Nations 2005a). Within Africa, however, it is not the poorest countries that are most affected by the disease. Botswana, while held up as one of the economic success stories of the



continent, has one of the highest HIV-seroprevalence rates in the world, estimated between 20 and 40 percent (Population Reference Bureau 2006; United Nations 2005b). Kenya is also often cited as a steadily growing economy, while around seven percent of its population suffers from the virus (United Nations 2005b).

According to the World Health Organization (WHO), "unprotected sexual intercourse" is the virus' "primary mode of transmission" across the globe (2004:9). Mother to child transmission (MTCT) is the second highest factor, accounting for approximately 10 percent of the new cases annually (World Health Organization 2007). These trends are also believed to hold true in Kenya (Wandia, Mwikali, Mwangi, and Mwikya 2004). A further five percent of the infections in Africa are attributed to unsafe practices in blood transfusions (Bogozzi 2005).

Due to the modes of transmission it is clear that HIV is inherently social, but it is still most often studied by scientists who take a biological or physical approach to the disease. The research that has been done by sociologists tends to focus on small subpopulations that are believed to be most at risk for contracting the virus such as commercial-sex workers and migrants (e.g., Cameron et al. 1999; Nishigaya 2002; Soskolne and Shtarkshall

2002). The problem with this method of sampling is that deciding which individuals are most at risk means acting on assumptions that have not yet been tested. While it is known that sex workers and many migrants engage in "high risk behavior," the means have not yet been available to determine who, across a nation, actually has the greatest risk of being infected. The Demographic and Health Surveys make it possible to determine those statistics.

#### **HIV/AIDS in Kenya**

In 1984 the first AIDS case was diagnosed in Kenya. By 2002 there were an estimated 2.5 million citizens living with the disease. The prior year 190,000 Kenyans had AIDS listed as their cause of death (Ministry of Health 2001). Very little is known, however, about who across the country is infected. Instead, the focus has been on factors that increase risk of exposure among subpopulations and whether and how the messages about AIDS and its prevention techniques are reaching the desired groups. The problem is, without knowing who is most at risk for infection, it is impossible to know whom to target.

#### **Theoretical Framework**

Much of the research that has been conducted on HIV/AIDS in sub-Saharan Africa can fit under one of two theoretical frameworks: the Health Belief Model (HBM) and

the concept of structural violence. The HBM was developed to help explain health outcomes based on individual decision-making. It is a micro-level approach to illness and disease based on Kurt Lewin's hypothesis that "behavior depends on the value of an outcome to an individual, and the individual's estimate of the probability that a given action will result in that outcome" (Mikhail 1981:67). The concept of structural violence was developed in many ways as a reaction to the HBM. It is a macro-level approach that suggests individuals' respective places in the social structure are better determinants of their health than any knowledge or beliefs they have.

#### The Health Belief Model

The Health Belief Model grew out of social psychological theory and is heavily related to rational choice theory. There are four major components of the HBM: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers (Rosenstock 1974). Susceptibility and severity relate to an individual's belief that he or she may contract a disease and how serious that outcome would be. Benefits and barriers, on the other hand, deal with the perceived efficacy of the preventative measures available and the barriers to carrying out those measures. Similar to rational choice,

if the benefits of a particular behavior outweigh the costs, an individual can be expected to engage in that behavior.

The findings in studies that have applied the Health Belief Model in Kenya are mixed. Most of them have focused on the first two components of the model, that is, perceived susceptibility and severity (e.g. Bauni and Jarabi 2000; Brockerhoff and Biddlecom 1999; Odhiambo 2003). HBM suggests that if people know about a disease, think it is severe, and believe they are at a high risk of contracting it, they will engage in behaviors that put them at the lowest risk possible. These studies found, however, that those who perceive themselves to be at highest risk of infection and have the most knowledge of the disease are also the ones who engage in more risky behavior than those who believe their risk is small.

Brockerhoff and Biddlecom's (1999) study was intended to examine the relationship between migrant status and sexual behavior. They argued that migrants would be at increased risk of HIV infection because they are moving from more "conservative" rural environments to more permissive urban ones. In addition, migrants are defined as innovators or "risk-takers" due to their voluntary movement among different sociocultural environments with

little to no support network. They found that some migrants did engage in increased risky behavior, while others did not. Female migrants from urban to rural areas, and male migrants from rural areas to urban centers had increased levels of risky sexual behavior. However, these behaviors were not due to decreased knowledge of AIDS or a decreased perception of their risk for contracting the disease. In fact, both the female and male migrants who engaged in risky behavior had significantly higher rates of knowledge of the disease than others, and the female migrants perceived themselves to be at higher risk for infection than the nonmigrants (the difference in perceived risk between male migrants and nonmigrants was not significant) (Brockerhoff and Biddlecom 1999).

Calvin Odhiambo (2003) later set out to test the HBM with a national sample rather than subpopulations. Using the 2003 Demographic and Health Survey he conducted his own study on the HBM. Odhiambo, like Brockerhoff and Biddlecom, found that the model did not sufficiently explain risky sexual behavior in Kenya. Over 99 percent of the Kenyans interviewed had heard of the virus. Around 80 percent believed it was "almost always fatal," suggesting they understood it to be severe. One-third perceived their chances of contracting HIV as moderate or higher. Of those

who perceived their risk as moderate or greater, 50 percent had more than one sexual partner, 20 percent said their spouse had other partners, and 20 percent did not use condoms. Around 45 percent of the females and 55 percent of the males believed using condoms would be beneficial to halting the spread of HIV/AIDS.

Examining the statistically significant findings, Odhiambo argues that

all factors being equal, the odds of having sex with multiple partners increased significantly for respondents who had *higher* levels of perceived susceptibility to HIV infection, and *higher* levels of cues-to-action in their environment urging AIDS prevention [emphasis mine]. (2003:111-12)

When examining the factors of perceived susceptibility and severity, the HBM does not seem to apply in Kenya.

There is one study, however, that suggests the HBM may still hold on some levels. Cameron et al. (1999) undertook a qualitative study of commercial sex workers, truck drivers and their assistants, and young men along the trans-Africa highway in Kenya. Through a series of focus groups and interviews, they found that, while the people they spoke with knew about HIV and they had heard of the most heavily advocated prevention methods, they did not believe any of the methods were truly effective. This finding suggests that even if individuals think their

susceptibility to and the severity of HIV are high, they believe the barriers to preventing infection are insurmountable; therefore, they still engage in risky behavior.

One of the most widespread HIV prevention campaigns across Africa is the A-B-C approach: Abstain, Be faithful, or use a Condom (Cohen 2004). When these methods were brought up in the focus groups, the respondents were skeptical of their usefulness. Among these groups abstinence was simply not an option. As sex workers, the women interviewed believed they had no choice but to engage in sex for their livelihoods. The men, on the other hand, argued that sexual urges were too strong to be controlled. They believed that, if a man wants to have sex, he must find a way to satisfy that desire. Faithfulness, for the men, was again out of their control. They agreed that they could be faithful to one partner, but there was no guarantee she would be faithful to them. Thus, they were still at risk. For the women faithfulness would undermine their livelihoods. Condoms were also considered an unreliable choice. The respondents believed they broke easily due to their poor quality, the heat, and the potential for them to be "pinched" (broken on purpose). According to this study it is not that the people do not

realize the risk they are taking, it is that they do not foresee a viable alternative to the decisions they are making.

The findings in these studies beg the question: why is it that the people who are engaging in risky behavior believe they have no other options? What are the mechanisms that trap them into thinking that a decision they know to be potentially fatal is the best one? Paul Farmer (1999) believes he has the answer. He argues it is not the beliefs or perceptions of the individuals that put them in the position they are in but rather their place in the wider social structure. He calls this concept structural violence.

### Structural Violence

*"Poverty is the worst form of violence."*

- Mahatma Gandhi

Johan Galtung (1969) was an ethicist and peace researcher in the 1950s and 1960s. His first book was *Gandhi's Political Ethics*, and he later adopted quite a few of Gandhi's beliefs. In 1969 he wrote a seminal article titled "Violence, Peace, and Peace Research." In it he laid out the framework for an idea that would later be attributed to him, structural violence. The concept was a simple one: unequal social systems yield injustices, which



lead to physical violence. Therefore, those who are discriminated against for any reason are at increased risk for all manner of violence.

Paul Farmer (1999) extrapolated from Galtung's ideas on physical violence and argued that the same concept could and should be applied to health. Through his work in Haiti and research in Southeast Asia and the United States, Farmer noticed that diseases such as tuberculosis and HIV disproportionately affect the poor. He used a number of individual cases to tell the tales of women whose poverty drove them into sex work, drug use, and other risky behavior. Farmer further argued:

Millions of women living in similar situations—but with very different psychological profiles and cultural backgrounds—can expect to meet similar fates. Their sickness is a result of structural violence: neither culture nor pure individual will is at fault; rather, historically given (and often economically driven) processes and forces conspire to constrain individual agency. (1999:79)

From Farmer's standpoint a person's place on the "social ladder" is a more important determinant of health than individual knowledge and attitudes. People who occupy the lowest strata in a group or culture do not have the luxury of weighing rewards and punishments; their social position constrains them to the point that their health is going to be compromised regardless of their beliefs.

In some ways the concept of structural violence seems obvious. Of course, the poor in developing countries are going to have less access to safe drinking water and health-care facilities. No woman who can work as a farmer or in a factory would choose to be a sex worker instead. It is the "obvious" nature of the theory, however, that may be its downfall. Much of the research that is done based on structural violence assumes it is a valid explanation (e.g. Cameron et al. 1999; McCally, Haines, Fein, Addington, Lawrence, and Cassel 1998; Nishigaya 2002; Phaladze and Tlou 2006; Soskone and Shtarkshall 2002). In many cases samples are drawn based on its premises (e.g., Cameron et al. 1999; Nishigaya 2002). It would seem almost comical to perform research on HIV by drawing a sample of relatively wealthy, well-educated women. The humor exists only because there is an assumption that the poor are at an increased risk of infection. But, are they?

There are a number of reasons why structural violence should be tested with regard to HIV in Kenya. Unlike many other infectious diseases, HIV is not contracted primarily from unsanitary living conditions, and access to health facilities would do little to halt its spread. Anti-Retrovirals have been shown to reduce the viral load in HIV positive individuals, which makes it less likely for the

person to infect others through sexual contact (United Nations 2005a). The drugs are expensive, however, and in Kenya the wealthy do not have much more access to them than the poor. The epidemiological reasons for the poor being more susceptible to disease than the rich do not hold up as well regarding HIV.

It is not known whether the social aspects of structural violence would hold true in Kenya. Like the Health Belief Model, much of the research supporting the theory was done in core countries, primarily the United States (e.g., Brendan 2006; Rhodes, Singer, Bourgois, Friedman, and Strathedee 2005). Farmer continued his work in Haiti and Southeast Asia, but he extrapolates his ideas from a handful of cases he witnessed, and these cases may or may not be generalizable. Therefore, it would be fruitful to test whether the theory holds in Kenya.

Farmer suggests that researchers can "describe a political economy of risk that...helps to explain where the AIDS pandemic is moving and how quickly" (1999:79). In order to accomplish this task, they must remember that

In many settings, HIV risks are enhanced not so much by poverty in and of itself but by inequality. Increasingly, what people with AIDS share are not personal or psychological attributes. They do not share culture or language or a certain racial identity. They do not share sexual preference or an absolute income bracket.

What they share, rather, is a social position—the bottom rung of the ladder in inegalitarian societies. (1999:91)

In order to derive hypotheses to test this theoretical model, it is necessary to ask the question: under what conditions are some people marginalized within Kenya's social structure?

To answer this question properly it is necessary to separate men and women. Due to beliefs about gender differences, the two sexes experience discrimination to different degrees in different spheres. Prior research also indicates that the relationship between socioeconomic status and risk for STD infection may be different for men and women (Gertig, Kapiga, Shao, and Hunter 1997; Newell, Senkoro, Mosha, Grosskurth, Nicoll, Barongo, Borgdorff, Klokke, Changalucha, and Killewo 1993). To account for this disparity, researchers who use the concept of structural violence must either test men and women separately or choose to study one or the other. This research focuses on women only, but future research should consider whether structural violence applies to men. In order to test the theory a number of variables will be used, including: poverty, education, migrant status, ethnicity, and marital status.

## Poverty

The research regarding the relationship between women's wealth and disease in sub-Saharan Africa offers complex and conflicting accounts. Wojcicki (2005) recently published a review of 36 studies that tested socioeconomic status as a risk factor for HIV infection in east, central, and southern Africa, and she found that 12 of them suggested women with high SES are actually at increased risk of infection. Only eight found a negative association between SES and risk, while one was mixed. The remainder found no association between the two variables.

Research done on HIV in the late 80s and early 90s found that SES and HIV status were positively related due primarily to the mobility of the rich (e.g., Hira, Ngandu, Wadhawan, Nkowne, and Baboo 1990; Van de Perre, Le Polain, and Carel 1987). People in occupations that required travel or that brought them into contact with those who travel such as truck drivers, commercial sex workers, soldiers, and barmaids were also known to be at higher risk and continue to have higher rates of infection (Carswell, Lloyd, and Howells 1989; Kirunga and Ntozi 1997; Oyadoke, Brieger, Adesope, Salami 2003). Within African communities, the perceived links between AIDS, wealth, and European influence can be seen in their slang terms for the

disease. It has been known in some African societies as Acquired *Income* Deficiency Syndrome, as well as *Julianna*, a brand of imported clothing that was a status symbol among adolescents in Tanzania (Setel 1999).

Over the last decade research has shown that the disease may be spreading from the wealthy, urban areas into rural, poorer regions (Decosas and Padian 2002). One possible reason for this trend is the migration patterns in many African countries. Unlike European countries, where people tend to move for extended patterns of time, migration within African countries is still largely cyclical (Brockhoff and Biddlecom 1999). Residents of rural areas may go to urban regions for work for a few months a year and then return to their rural homes for the harvest. This constant back and forth makes the spread of STDs such as HIV between rural and urban areas much more likely than in countries where people make more stable, long-term moves.

It is important to determine who is currently infected in Kenya for both theoretical and practical purposes. The idea of structural violence has been studied much more extensively in Europe and the United States than in developing countries. However, many HIV prevention programs operate on the assumption that the theory can be

used to explain the spread of the virus anywhere in the world. One of the stated aims of micro-lending programs is to increase women's income to put them at decreased risk of HIV infection (Chege 2005). Others argue that, if developing nations can educate women, they will see a drop in AIDS rates (Phaladze and Tlou 2006). Those claims could be dangerous to make, however, without knowing who is contracting the disease.

The purpose of this research is not only to explore the realities of the distribution of HIV in Kenya, but also to test the theory of structural violence. Farmer argues, "Structural violence is visited upon all those whose social status denies them access to the fruits of scientific and social progress" (1999:79). Given that poorer women will have a limited ability to access many things the wealthy have available, his argument leads to the first hypothesis that will test his theory:

H1: As a woman's wealth increases, her risk of HIV infection will decrease.

### **Education**

Similar to wealth, prior research regarding the relationship between education and HIV infection reveals mixed findings. Nishigaya's (2002) study of female garment workers in Cambodia found that low education, low wages,

dependency within the home, and perceived obligations to support parents financially determined whether women entered into sex work. Nishigaya further argued that risk of HIV infection is, therefore, spread along "gradients of power," a phrase borrowed from Farmer (1999). However, there is still a question of whether her findings are generalizable to Kenyans (and even outside her 20-woman sample in Cambodia).

Wojcicki's (2005) review also discusses the education-HIV link. Three of the studies examined found a negative association between education and risk of HIV infection. In the first study Kapiga and Lugalla (2002) found a linear relationship between education and risky sexual practices, with an increase in schooling leading to a decrease in risky behavior. Their study was done using the 1996 Demographic and Health Survey in Tanzania, which employed a nationally representative sample. The second set of researchers also used a nationally representative sample, this time in Zambia. They used HIV seroprevalence as the dependent variable rather than risky sexual behavior, and found that it had a significant negative relationship with education (Fylkesnes, Musonda, Sichone, Ndhlovu, Tembo, and Monze 2001). The third compared a variety of cross-sectional studies done on women in antenatal clinics in



rural Zimbabwe. Using HIV-1 prevalence as the dependent variable, they found a significant negative relationship with high education (Gregson, Terceira, Kakowa, Mason, Anderson, Chandiwana, and Carael 2002).

Three other studies reviewed found a positive association between HIV risk and women's education. One used a sample of urban respondents in Tanzania, another used rural respondents in Uganda, and the third included only childbearing women in Zambia. All of them determined that more educated women have an increased risk of contracting HIV. A further six studies found no association between female education or literacy and risk of infection.

If anything can be taken from these findings, it is that a woman's education has a variable affect on her chances of acquiring HIV. There are limited data suggesting what outside factors influence how education impacts risky behavior. It is, therefore, necessary to test this relationship with regard to Kenya.

Proponents of the structural violence concept suggest women who have more autonomy are less likely to contract infectious diseases. The argument is that women with a higher education should have more individual agency, and fewer social binds that would limit their ability to choose

how to act. Therefore, the hypothesis regarding education that rises out of the theory of structural violence is:

H2: As a woman's educational attainment increases, her likelihood of having HIV will decrease.

When including a variable for education, one should also control for age. Young women who have not yet had the opportunity to achieve higher education would not be any further down the social ladder than middle-aged women who have gone to school. Older women also would not be expected to have the same education as younger women who grew up in settings that were more amenable to educating girls.

Prior research (see Brockerhoff and Biddlecom 1999) also shows that women 20-39 years old have significantly higher rates of HIV than other age groups. In addition, age could be a confounding factor because HIV is non-curable. A cluster of 35-40 year old women who are infected with HIV does not necessarily mean that 35-40 year old women are engaging in practices that put them at risk. It simply means that at some point in the last 25 years (since AIDS was first diagnosed in Kenya) they engaged in risky behavior. Therefore, age should not be included as a theoretical indicator, but it should be included as a control variable.

### Migrant Status

The relationship between migration and HIV status is one of the most heavily researched aspects of the disease (e.g. Brockerhoff and Biddlecom 1999; Cameron et al. 1999; Nishigaya 2002; Soskolne and Shtarkshall 2002). Soskolne and Shtarkshall (2002) provide an overview of the forms in which migration may assist the spread of HIV on every level from the micro to the macro. At the individual level, they argue, the stress of changing cultures and being in a new environment may lead to risky sexual behavior. At the intermediate level migrants have limited social capital because they lose contact with the people to whom they may have turned in the past. And at the macro level migrants have limited power in a new social setting as well as often having a lower socioeconomic status than those around them.

While Soskolne and Shtarkshall's (2002) study focused on Israelis, the same arguments can be made in the context of Kenya. Regardless of the wealth or power migrants have at their homes, they lose any cultural capital they have when they are constantly moving to different parts of the country. Owing to their steady employment, migrants may be at or near the top of the social pyramid economically, but socially they do not have access to many of the resources others do. Therefore, they are in some ways denied "the

fruits of scientific and social progress" (Farmer 1999) rendering them more susceptible to HIV.

There is evidence to suggest, however, that it is not migration in itself that increases women's risk of infection but migration between certain areas. Brockhoff and Biddlecom (1999) used Kenya's Demographic and Health Survey to study risky sexual behavior among migrants and nonmigrants. They found that women who migrated to rural areas from urban ones were more likely to engage in risky behavior than nonmigrants. Women who migrated to urban areas from rural ones, however, were less likely to engage in those behaviors (specifically having multiple sexual partners and having sex without a condom) than nonmigrants.

There is nothing in the theory of structural violence to suggest that the type of migration would affect a woman's odds of contracting HIV. In fact, Farmer (1999) argues that women who migrate to urban areas from rural ones should be at an increased risk of contracting the disease because they would likely be more vulnerable economically than women who migrated from an urban to a rural area. Therefore, the hypothesis that structural violence suggests is:

H3: All migrants are at an increased risk of contracting HIV.

### Ethnicity

While ethnic differences in health status and access to health care are studied often in the United States and Europe (e.g., Hudson, Stockard, and Ramberg 2007; LaVeist 2000), they have largely been ignored in research in the developing world. In cases in which researchers take ethnicity into consideration, it tends to be controlled for by drawing the entire sample from one or two groups (e.g., Ambasa 2004), or it is pushed aside by including some measure of "region." To get a complete look at how structural violence operates, however, it is necessary to compare the ethnic groups within a country.

When examining HIV through the lens of structural violence, there are two ways in which ethnicity may affect a woman's odds of contracting the disease. The first is that there may be some ethnic groups in Kenya that are systematically or routinely marginalized. This marginalization would put the women within these groups at a lower position on the social ladder, and it would decrease their power in the overall social structure. Because the sample is entirely women, however, there is another way they may be affected. Some ethnic groups could

have a higher degree of gender inequality than others. Therefore, the women within those groups would be at an increased risk even if the group as a whole were not discriminated against in the country. It is, then, necessary to determine which ethnic groups tend to be less valued in Kenya and which tend to have the highest degrees of gender inequality in order to determine which women should have the highest odds of contracting HIV.

**Marginalized Ethnic Groups in Kenya.** In sub-Saharan Africa giving preference to one's own ethnicity is still widely practiced (Weinreb 2001). Politicians are expected to favor their ethnic groups when distributing resources, which offers an advantage to those groups that are able to elect their own members. Kenya is no different; ethnicity is a key determinant in access to political power and support from those in power (Holmquist and Ford 1994; Kitching 1982). One should, therefore, be able to use political dominance as a proxy for access to resources.

There are more than 70 recognized ethnic groups in Kenya, but 75 percent of the population identifies with one of the five largest: the Kikuyu, Luhya, Luo, Kalenjin, and Kamba (Central Intelligence Agency 2007). To date only the Kikuyu and Kalenjin have been represented in the presidency. This trend is due, in part, to ethnic

constituency being necessary for participation in national politics (Weinreb 2001). The access to power and resources the Kikuyu and Kalenjin have through political connections leads to a fourth hypothesis:

H4: The Kikuyu and Kalenjin will have the lowest odds of having HIV.

#### Ethnic Groups with Highest Degrees of Gender

Inequality. There are many reasons to believe gender inequality may play a role in the spread of HIV among women. Prior studies have found links between physical partner violence and risk of HIV (Fonck, Els, Kidula, Ndinya-Achola, and Temmerman 2005). Unequal employment opportunities, access to wealth, and divisions of labor may also play a role (Phaladze and Tlou 2006). In addition, women in developing countries are still often either denied an education, or they are not allowed to complete it to the level of their male counterparts (Campbell and Kelly 1995). All of these factors play a role in women's increased risk of contracting HIV.

Any measure of gender inequality is going to be subjective on some level. Some ethnic groups in Kenya still practice female genital mutilation. The Luo believe in women's ritual "cleansing." When a man dies, his wife must cleanse herself of him by having sex with a member of

his family. Others simply pass the wife and her children down from one brother to the next in the case of death. Determining which of these amounts to the highest degree of gender inequality is difficult, especially for a researcher so far removed from the situation. Therefore, a more objective measure is needed.

Chiho Suzuki's (2006) dissertation examined the link between intimate partner violence (IPV) and a number of outside factors. During her analysis she found that women in the Luo and Luhya ethnic groups were significantly more likely to experience IPV than those in other groups. Using IPV as a proxy for gender inequality, a fifth hypothesis emerges:

H5: Women in the Luo and Luhya ethnic groups will be more likely than those in other ethnic groups to have HIV.

### **Marital status**

Unlike many of the variables listed above, marital status does not have a direct effect on a woman's resources. Unmarried women in a wealthy household may be in a much better position to receive health care and education than married women in poorer households. However, marital status can be used to measure another component of socioeconomic position: prestige.



According to tradition marriage was seen as a rite of passage that every Kenyan was expected to undergo. It was a way of extending the family, making it a large social and economic unit that helped guarantee the survival of all its members. This belief is still widely held in rural areas (Francis 1998). Marriage for women is the norm, while never married, divorced, and widowed women stand on the second tier. This stratification among marital statuses leads to another hypothesis:

H6: Married women in rural areas will have the least risk of having HIV.

However, marriage may not be viewed as highly in urban areas. Urban Kenyans are increasingly viewing marriage as an institution that should be controlled by love, not economics. With more women entering the workplace and becoming financially independent, they are more openly arguing against being used as a commodity. There is also evidence that urban women are choosing to eschew marriage in exchange for independence and freedom. In addition, as one woman put it, "The average man might contribute to the rent but use the rest for mistresses and beer" (Perlez 1991, para. 6). Her quote suggests that men are expected to have relationships outside of marriage, which may put

married women at an increased risk of contracting HIV. The hypothesis that is suggested, then, is

H7: Married women in urban areas are at a greater risk of infection than others.

### **Summary**

The concept of structural violence is a simple one that seems valid on its face. It is difficult to dispute the idea that poor people without access to all of the resources in a country will likely have an increased risk of exposure to infectious diseases. Because of the obvious nature of the theory, however, it often goes unchecked in practice. Nongovernmental organizations and health workers target poorer regions for educational campaigns and assistance, without knowing whether these areas are actually the hardest hit.

Sociologists and epidemiologists, on the other hand, have extensively studied the relationship between socioeconomic status and risk of contracting HIV; however, there have been few generalizable findings. The dependent variable in many of these studies was some measure of "risky sexual behavior"; this measure included anything from multiple sexual partners to having sex without a condom. Different researchers have found positive, negative, and no association between their measures of SES

and engaging in risky behavior. In order for an effective program to be created in Kenya, it is, therefore, necessary to test the relationship in the country and at the national level.

This research has both theoretical and practical implications. At the theoretical level it can be used as a test of structural violence in a developing country. It will aid in determining whether and how the theory applies in this setting. At the practical level it will show which groups in Kenya have the highest odds of contracting HIV. It cannot be altered by respondents' biased representations of their sexual behavior, which should give a more accurate picture of who is actually at risk of contracting the virus.

### CHAPTER III METHODS AND MEASURES

The data used in this study were collected in Kenya by the Demographic and Health Survey for 2002 and 2003. The survey was conducted household to household, and every eligible adult (ages 15-49 for women) was given the opportunity to participate. The standard DHS includes questions regarding socioeconomic status, demographic characteristics, access to health items and care, and a number of items on family planning, children, and nutrition within a household. In 2001 the DHS also started to include a set of questions on HIV. These items included questions about knowledge of the disease, its modes of transmission, and methods of prevention. In 2003 the agency added the option of an anonymous HIV test that could be taken after the survey was complete. With these tests it became possible to match people's behaviors, attitudes, beliefs, socioeconomic status, and demographic characteristics to their HIV statuses.

Samples for the DHS are typically between five and thirty thousand households. The data include a set of weights for making the sample nationally representative.

Kenya's 2003 data had 11,773 respondents, including 8,195 women. Of the women who took the survey, 4,042 opted to take the HIV test, and 3,265 of the tests returned a definite positive or negative. The Demographic and Health Survey's (2003) analysis of the data showed no significant differences between the women who took the test and those who did not so the weights included in the dataset should still apply.

#### **Dependent Variable**

Prior to this survey, question items pertaining to sexual practices were some of the most valuable data available when looking at HIV risks in sub-Saharan Africa. However, Caldwell, Caldwell, and Quiggin (1989) criticized those results as potentially invalid. They argued that cultural norms may lead to response bias, with men tending to overestimate their number of sexual partners while women may underestimate them. This research bypassed the issue by using HIV status as the dependent variable. In the analysis women without HIV were coded "0," while women who tested positive for HIV were coded "1." There was no differentiation between women with HIV-1 and HIV-2.

#### **Independent Variables**

Prior research and the theoretical framework of structural violence provided the justification for the

independent variables used in this study. They include the respondent's wealth quintile, education, migrant status, ethnicity, and marital status. Two control variables, age and location, were also included in the analysis.

#### Wealth Quintile

The DHS measures wealth based on a composite score from a number of survey items. The measure is one of household wealth, and it includes such indicators as access to safe drinking water and health-care facilities, the construction materials of the household, and household items such as a telephone and radio. An index is then created, and households are divided into quintiles ranging from "poorest" to "richest." Because wealth is determined by household and not individual, the categories are not evenly distributed. In this dataset the "richest" make up 31.3 percent of respondents, while the "poorest" are only 16.8 percent. As an ordinal variable in logistic regression, the five categories were turned into dummy variables before being entered into the model.

#### Education

The DHS includes five separate indicators of respondent's education. There are measurements for single years in school, highest year of education, highest educational level, educational attainment, and literacy.

In this analysis, highest year of education ranked 0 through 15 years was used to measure the respondent's education.

### Migrant Status

Following the example of Brockerhoff and Biddelcom (1999), migrant status was determined by looking at the current type of place of residence (urban or rural), and the time spent at previous residence. If the respondent had lived in a community other than the current one for more than six months, she was considered a migrant. The analysis included separate measures for urban-urban, rural-urban, urban-rural, and rural-rural migrants as well as nonmigrants. Similar to wealth, the classes were turned into dummy variables in the model. Nonmigrants were entered as the reference category.

### Ethnicity

The Kenya DHS includes 15 ethnic groups, with one "other" category. Following the lead of Akwara, Nyovani, and Hinde (2003), some of the groups were combined to have ten classes included in the model. The KDHS lists the Mijikenda and Swahili as one group, while the Taita and Tavate are another. Akwara et al. (2003) combine the Mijikenda, Swahili, and Taita so the four were grouped together into one. They also combined the Embu and Meru

into one class so the same was done for this research. The included ethnicities, then, are the Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Meru/Embu, Mijikenda/Swahili/Taita/Tavate, Somali, and others. The "others" class includes the Masai, Turkana, Kuria, and those originally placed in that category. None of those groups made up more than two percent of the original sample.

As the majority group in Kenya, the Kikuyu were included in the model as the reference group. The others were grouped and dummied before being added.

#### Marital Status

There are six classes of marital status included in the data: never married, married, living together, widowed, divorced, and not living together. Because marital status was expected to have a different effect in rural versus urban areas, twelve dummies were created from these classes. The variables were: rural never married, rural married, rural living together, rural widowed, rural divorced, rural married but not living together, urban never married, urban married, urban living together, urban widowed, urban divorced, and urban married but not living together. Using these twelve variables it is possible to



compare the marital statuses within and between urban and rural areas.

### **Control Variables**

Prior researchers (e.g., Wojcicki 2005) of HIV in sub-Saharan Africa suggest controlling for gender, age, and urban or rural location in any study of the disease. In this case gender is not an issue because the sample includes women only. Age and location, however, still need to be taken into consideration.

### **Urban Versus Rural Location**

To control for urban and rural location, two different models were used. In the first only the control variables--age and location--were included. In the second model, only the control variables and wealth were entered. These two models gave an indication of the effect location has on a woman's odds of having HIV. In both of these models urban was used as the reference category. A third model was also run, which included all of the independent variables except location. Urban and rural location was excluded to avoid collinearity problems with the marital status-location combination.

### **Age**

The correlation between certain age groups and the likelihood of having HIV is well documented (Brockerhoff

and Biddlecom 1999). People aged 20 to 35 are known to be more sexually active, have more sexual partners, and engage in more risky behaviors overall than those younger or older (Teshome, Mehret, and Fikre 2002). Therefore, a control for age was included in the model. Because age is known to have a nonlinear effect on a person's risky behavior, both age and age squared were entered.

### **Measures**

The dependent variable in this research, HIV status, is dichotomous. There are also multiple independent variables at both interval/ratio and nominal levels of measurement. Therefore, the appropriate type of analysis to test this model is logistic regression. This type of regression also lends itself well to answering the initial research question, "Which women in Kenya have the greatest odds of contracting HIV?"

### **About Logistic Regression**

Logistic regression is used to predict the log odds of being in one class over another. The model for predicting the dependent variable (Y) is:

$$Y = \alpha + \beta X + e$$

Where Y is  $\log(p/1 - p)$ ,  $\alpha$  is the minimum probability of the dependent variable across all individuals,  $\beta$  is the matrix of all the coefficients measuring the effects of variables

at the individual level,  $X$  is the matrix of all the independent variables, and  $e$  is the error term that represents the individual variation in the dependent variable not captured by the independent variables specified (Kleinbaum, Klien, and Pryor 2005). Using this type of regression on the models presented, it is possible to determine which socioeconomic statuses and demographic characteristics significantly increase or decrease a woman's odds of having HIV.

#### Assumptions

There are a few assumptions that need to be met before logistic regression can be used, but overall it is relatively flexible. Unlike other types of regression, the data and their error terms do not need to be normally distributed. There is no assumption of homogeneity of variance; that is, the dependent variable does not need to be homoscedastic for each level of the independent variables. The independent variables also do not need to be interval/ratio, which allows for inclusion of variables such as migrant and marital status. Finally, logistic regression is able to handle some nonlinear effects even when they are not explicitly added to the model. All of these exceptions make logistic regression a fairly robust

type of analysis. There are, however, quite a few assumptions that do apply.

The results from a logistic regression would be very difficult to interpret if the variables were not coded meaningfully. The convention is to code the dependent class in which the researcher is most interested as "1," and the other class as "0." That convention was followed in this research; HIV negative women were coded "0," while HIV positive women were coded "1."

Logistic regression also assumes that all relevant variables are included in the model, and all irrelevant variables are excluded. These inclusions and exclusions ensure that the variance attributed to each variable is theirs alone. While it is impossible to say that any one model includes all the relevant predictors of contracting HIV, the attempt was made to include all the predictors and necessary controls for testing the existence of structural violence.

The independent variables are expected to have low measurement error and no missing cases. Overall, the DHS has very good data, with few missing cases. Among the 3,265 women who received a definite positive or negative on their HIV tests, there were only 115 who had missing data

on any of the independent variables tested. These 115 cases were removed from the analysis.

Logistic regression does not account for interaction effects unless they are created and added to the model. Because this research is preliminary, interaction effects were not included in the models. Once the significant predictors of HIV status are known, it will then be worthwhile to test for these effects.

As with other types of regression, multicollinearity and outliers can affect the reliability of the results. Outliers in the data were dealt with by adding them into the closest category in ordinal and interval/ratio level variables. In the case of nominal variables, the outliers were removed or their category was grouped with another where appropriate.

The sample size and distribution also needed to be taken into account before using logistic regression. If the sample was too small, the coefficients found may have been inflated. With 3150 cases in the data set, and 264 who are HIV positive, the sample size was not an issue. Adequate distribution of the sample was tested using crosstabs.

## CHAPTER IV RESULTS

The 2003 Kenya Demographic and Health Survey included 8,183 women. Among the respondents 4,035 elected to take the HIV test and 3,265 returned a positive or negative result; the others were inconclusive. There were no significant differences between the women who took the HIV test and those who did not.

Examining the data set, 114 women were missing responses for the type of place of their previous residence, making their migrant status impossible to identify. One woman did not have a response for her education. These 115 women were removed from the data set, leaving a sample size of 3,150 with responses in every category. Eight percent of the women in the sample tested HIV positive. This number is commensurate with the data in previous studies designed to measure Kenya's HIV prevalence rate (UNAIDS 2006). Table 1 presents the distribution of the other variables that were tested.

The KDHS respondents were all between 15 and 49 years old. The majority were younger than 30, with only 15 percent of the respondents between 40 and 49. Most of the

**Table 1: Distribution of Respondents'  
Social and Economic Characteristics**

<b>Characteristic</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Age</b>		
15-19	701	22.3
20-24	648	20.6
25-29	521	16.5
30-34	458	14.5
35-39	341	10.8
40-44	284	9.0
45-49	197	6.3
<b>Location</b>		
Urban	951	30.2
Rural	2199	69.8
<b>Wealth Index</b>		
Poorest	546	17.3
Poorer	563	17.9
Middle	571	18.1
Richer	607	19.3
Richest	863	27.4
<b>Education</b>		
None	506	16.1
Primary (1-8)	1717	54.5
Secondary (9-12)	747	23.7
Post Secondary (13+)	180	5.7
<b>Migrant Status</b>		
Urban-Urban	211	6.7
Urban-Rural	122	3.9
Rural-Urban	571	18.1
Rural-Rural	1387	44.0
Nonmigrant	859	27.3
<b>Marital Status</b>		
<i>Urban</i>		
Never Married	324	10.3
Married	445	14.1
Divorced	18	0.6
Widowed	31	1.0
Living Together	67	2.1
Not Living Together	66	2.1

**Table 1: Distribution of Respondents'  
Social and Economic Characteristics (cont.)**

<b>Characteristic</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Marital Status</b>		
<i>Rural</i>		
Never Married	576	18.3
Married	1296	41.1
Divorced	25	0.8
Widowed	103	3.3
Living Together	110	3.5
Not Living Together	89	2.8
<b>Ethnicity</b>		
Mijikenda/Swahili/ Taita/Tavate	274	8.7
Embu/Meru	168	5.3
Kalenjin	273	8.7
Kamba	301	9.6
Kikuyu	717	22.8
Kisii	200	6.3
Luhya	515	16.3
Luo	337	10.7
Somali	194	6.2
Others	171	5.4
<b>HIV Status</b>		
Negative	2886	91.6
Positive	264	8.4
<b>Total</b>	<b>N = 3150</b>	<b>100.0</b>

women in the sample were from rural areas, while 30 percent listed their residence as urban. The wealth quintile with the highest representation was "richest," with 27 percent of the respondents falling into that category. Seventeen percent were recorded as "poorest." The quintiles are not evenly distributed because wealth was measured by the household rather than the individual.



Most of the women had only a primary-level education. Sixteen percent had no education, while five percent continued past the secondary level. About one-fourth of the respondents have never moved from their hometowns. Forty-four percent have migrated from one rural area to another, 18 percent from a rural to urban area, and only four percent from an urban to a rural area. Forty percent of the respondents are rural, married women. Eighteen percent have never married and are living in rural areas. Fourteen percent are married and living in urban areas, while 10 percent of the women in urban areas have never married.

The sample's distribution of ethnicities is very close to the national distribution for most groups. The Kikuyu have the highest representation, with 22 percent of the women identifying with that group. Sixteen percent self-identify as Luhya, while 11 percent consider themselves Luo. The Kalenjin may be slightly underrepresented at only nine percent of the women in the sample.

Three models were used to test the hypotheses. In the first model only the controls--age and location--were included. In the second model wealth was tested along with the control variables. Wealth was run in isolation because it is at the root of the theory of structural violence. If

the theory can be applied to HIV in Kenya, poorer women should have significantly greater odds of being HIV positive than have richer women. In the third model all of the variables were included. Urban versus rural location was removed from the third model, however, due to collinearity with the marital status combined with location.

#### Model 1

The first model included age, age squared, and location (see Table 2). Age squared was added because the relationship between age and HIV status is not linear. Both age and age squared were significant at  $p < .001$ . Their odds ratios suggest that as a Kenyan woman gets older, her odds of having HIV increase, but once she reaches a certain age, her odds decrease again. This finding makes sense considering younger women are likely to be more sexually active and in less stable relationships than older women.

Urban versus rural location was also significant at  $p < .001$ . Urban was left out of the model as the reference group, and the odds ratio returned was 0.621. Therefore, according to this model, living in a rural area reduces a woman's odds of having HIV by 38 percent.

## Model 2

In the second model only wealth was entered with the control variables (see Table 2). Age and age squared continued to be significant predictors of a woman's odds of having HIV. The addition of wealth negated the effects of location, however.

When wealth was included in the model, the "poorest" were used as the reference category, and the others were expected to have odds ratios less than one. Instead, as the women's wealth status increased, so did their odds of being HIV positive. The odds of a woman having HIV increased 136 percent between the "poorer" and "poorest" categories of wealth. The richest women in the sample had the highest odds of being HIV positive. Their odds ratio was 2.947 ( $p < .001$ ), which means that being in the highest wealth quintile increases a woman's odds of having HIV by 195 percent compared with those in the lowest quintile. The middle quintile was anomalous in this model. Being in the middle category still raised a woman's odds of having HIV 94 percent compared with the lowest quintile, but it did not raise them as much as being in the second, "poorer" category.

This second model, however, does not give a complete picture. There are a number of variables that need to be

Table 2: Logistic Regression Analysis of Predictors of HIV Status

IVs	Model 1		Model 2		Model 3	
	B (S.E.)	Odds Ratio	B (S.E.)	Odds Ratio	B (S.E.)	Odds Ratio
Age	.395 (.057)	1.484***	.399 (.057)	1.491***	.463 (.070)	1.589***
Age <sup>2</sup>	-.006 (.001)	.994***	-.006 (.001)	.994***	-.008 (.001)	.993***
Location (urban=ref)	-.476 (.139)	.621***	-.135 (.207)	.874	--	--
<b>Wealth</b>						
Poorest (Ref)			--	1.0	--	1.0
Poorer			.856 (.257)	2.355**	.814 (.280)	2.257**
Middle			.661 (.265)	1.936*	.862 (.288)	2.367**
Richer			.881 (.256)	2.414**	1.013 (.289)	2.755***
Richest			1.081 (.291)	2.947***	1.260 (.339)	3.542***
<b>Education</b>					-.025 (.023)	.975
<b>Migrant Status</b>						
Non-Migrant (Ref)					--	1.0
Urban-Urban					.051 (.412)	1.052
Urban-Rural					-.267 (.381)	.765
Rural-Urban					-.121 (.370)	.886
Rural-Rural					.150 (.223)	1.161
<b>Ethnicity</b>						
Kikuyu (Ref)					--	1.0
Embu/Meru					-.051 (.352)	1.052
Kamba					.480 (.258)	1.617
Kalenjin					.077 (.307)	1.080
Kisii					.464 (.335)	1.591
Luhya					.467 (.242)	1.595
Luo					1.825 (.214)	6.200***
Somali					-2.059 (1.039)	.128*
Mijikenda/Swahili/ Taita/Tavate					-.106 (.379)	.900
Others					-.092 (.432)	.912

Table 2: Logistic Regression Analysis of Predictors of HIV Status (cont.)

IVs	Model 1		Model 2		Model 3	
	B (S.E.)	Odds Ratio	B (S.E.)	Odds Ratio	B (S.E.)	Odds Ratio
<b>Marital Status</b>						
Urban						
Never Married					.162 (.489)	1.176
Married					.297 (.471)	1.346
Living Together					.392 (.637)	1.480
Divorced					1.347 (.840)	3.845
Widowed					2.813 (.663)	16.668***
Not Living Together					1.233 (.527)	3.432*
Rural						
Never Married					-.014 (.300)	.986
Married (Ref)					--	1.0
Living Together					.434 (.310)	1.544
Divorced					1.114 (.544)	3.046*
Widowed					1.975 (.269)	7.206**
Not Living Together					1.275 (.295)	3.580***
Constant	-7.883 (.848)	***	-8.986 (.903)	***	-10.478 (1.132)	***
-2 Log Likelihood	1821.828		1802.972		1577.675	

\* p < .05, \*\* p < .01, \*\*\* p < .001

included before any conclusions can be drawn about the relationship between socioeconomic status and HIV status. All of these variables were added in the third model to test the structural violence theory fully.

### Model 3

In the third model, age (OR = 1.589) and age squared (OR = .993) were again significant at  $p < .001$  (see Table 2). The relationship between wealth and HIV status also stayed the same, this time with a distinct pattern. The poorest women still had the lowest odds of having HIV, while the richest (OR = 3.542) were most likely to have it. Unlike the second model, however, this time the odds ratios increased in order.

Contrary to prior research (Brockerhoff and Biddlecom 1999; Wojcicki 2005), neither educational attainment nor migrant status was significant regardless of the region from which or to which the woman was migrating. Ethnicity, however, did prove to be a significant factor. Using the Kikuyu, the largest ethnic group in the country, as the reference group, both the Luo and Somali had significant differences in odds of being HIV positive. Being Luo (OR = 6.200) increased a woman's odds of having HIV 520 percent over a Kikuyu. Being Somali decreased her odds 87 percent.

Marital status was also a significant predictor of HIV status. As the status-quo, married women in rural areas were used as the reference category. Being a widowed woman in both urban and rural areas increased one's odds of having HIV. Urban widows' odds were increased 1567 percent, while rural widows' odds increased 621 percent. Urban and rural women who were married but did not live with their spouses also had increased odds of being HIV positive. The urban women's odds increased by 242 percent, while the rural women's odds increased by 258 percent. Being a divorced woman in a rural area increased a woman's odds of having HIV by 205 percent compared with rural married women. None of the other marital statuses were significant predictors of HIV status.

The -2 Log Likelihood, a goodness-of-fit measure for the model, was 1577. This number indicates that while the model does significantly predict a woman's odds of having HIV, there are likely better measures available. The possibilities will be elaborated upon further in the next chapter.

## CHAPTER V CONCLUSIONS AND DISCUSSION

The findings from this research have both theoretical and practical implications. They help in determining whether structural violence is a suitable theoretical model for understanding the spread of HIV in Kenya, and they give those people who are trying to stop its spread a better idea of where to target their efforts. The findings also give a more complete picture of who is contracting HIV than the smaller studies that have been carried out in Kenya (e.g., Ambasa 2004; Andwara, Madise, and Hinde 2003; Brockerhoff and Biddlecom 1999; Cameron et al. 1999; Fonck et al. 2005).

### Theoretical Implication of Findings

Structural violence suggests that women who have limited access to resources have the highest odds of contracting HIV. One of the hypotheses derived from this theory is supported by the data. Overall, however, the findings do not support the theory, and in some cases they contradict it.

Paul Farmer (1999), one of the main proponents of structural violence, suggests that wealth is the major



factor in structural violence when he writes, "Historically given (and often economically driven) process and forces conspire to constrain individual agency" (1999:79). It was this argument that lead to H1: As a woman's wealth increases, her risk of HIV infection will decrease. According to the data, the opposite is true.

Wealth was included in two different models. In the first, it was alone with the control variables. In the second, it was included with all of the other indicators derived from structural violence. The data from both models indicate that women with increased wealth also had increased odds of having HIV. Not only do these findings suggest that structural violence may not apply to HIV in Kenya, but they also indicate that relative poverty may provide some form of protection against the disease.

While these findings may be surprising to many who live in Western countries, the slang terms for HIV/AIDS mentioned previously (e.g., Acquired *Income* Deficiency Syndrome) suggest that many Africans already understood the relationship between wealth and HIV. There are practical reasons why wealth may be associated with higher odds of having HIV as well. If wealthy women have access to antiretroviral drugs, they will live longer than women in poorer families. If women in poor families are contracting

HIV at the same rate as those in wealthy families but dying at a higher rate, the poorer women's prevalence rate will be lower.

It is possible that the virus is spreading from wealthy urban regions into the poorer rural areas, but that is impossible to test with this cross-sectional dataset. Only data collected at two or more points in time could be used for determining whether HIV is migrating within the country.

While wealth is the major indicator of access to resources, Farmer is careful to point out that it is not the only facet of social position. In any unequal society, he argues, those at the bottom are at an increased risk of HIV infection. This argument led to the following hypotheses:

H2: As a woman's educational attainment increases, her likelihood of having HIV will decrease.

H3: All migrants are at an increased risk of contracting HIV.

H4: The Kikuyu and Kalenjin will have the lowest odds of having HIV.

H5: Women in the Luo and Luhya ethnic groups will be more likely than those in other ethnic groups to have HIV.

H6: Married women in rural areas will have the least risk of having HIV.

H7: Married women in urban areas are at a greater risk of infection than others.

Education was not a significant predictor in the model. This finding means that when one controls for the other independent variables, a Kenyan woman's educational attainment is not related to her odds of contracting HIV/AIDS. Therefore, either structural violence is not linked to education with regard to HIV in Kenya, or women with limited education are not discriminated against in real terms.

There were also no significant differences in migrant and nonmigrant women's odds of having HIV. The current location and the place from which the women migrated did not make a difference. This finding further suggests that structural violence is not the best framework for understanding the spread of HIV in Kenya.

Contrary to the fourth hypothesis, women in the Kikuyu and Kalenjin ethnic groups had odds of having HIV comparable to those in most other ethnic groups. Having connections in the political arena, therefore, does not trickle down to give them an advantage when it comes to HIV/AIDS. Somali women, on the other hand, had significantly lower odds of having HIV than any other ethnic group. This finding is surprising from a structural violence standpoint because Somalis tend to be one of the more marginalized ethnic groups in Kenya (Menkhaus 2005).

While the Luhyas' incidence of HIV was about the same as the other groups', the Luos' HIV rate was significantly higher than the rest. Luo women have at least 500 percent greater odds of having HIV than any other ethnic group. Because the Luo also have a significantly higher rate of interpersonal violence than most other groups (Suzuki 2006), this finding supports the idea that a woman's status within her relationship may be just as critical as her standing in the wider society when determining her risk for contracting HIV. However, the Luhya also have a higher rate of interpersonal violence than other ethnicities, while their HIV rates are about the same. Therefore, other factors not covered in this thesis must be at play.

Some of the findings related to marital status follow from structural violence, while others do not support the theory. Widowed women had much higher odds of having HIV than any other group, but there is also a good chance that a Kenyan widow between 15 and 49 years old lost her husband to AIDS. There is also a possibility that widowed women, who were once financially supported, now need to find a way to take care of themselves and their children so they engage in high-risk behavior. Further research is needed to fully understand what is happening in that relationship.

Divorced women in rural areas also had significantly higher odds of being infected than did married women in the same regions. While it was not specifically stated in the initial hypotheses, this finding could be considered as supporting the structural violence theory. Fifty-nine percent of the women who live in a rural area are married, while just over one percent are divorced. Divorced women have broken from the status quo and, therefore, are not as high on the social ladder. These women also must find a way of providing for themselves and their families, which may push them into risky behaviors. Again, further research is needed to gain a fuller understanding of the relationship between marital status and HIV.

Overall, structural violence does not seem to be a good model for understanding the spread of HIV in Kenya although there are some instances in which it may apply. It should be noted that while these findings may be generalizable to a wider geographic region than Kenya, they should not be considered outside the context of HIV.

The combined qualities of the HIV virus make it fundamentally different from other infectious diseases. HIV is both chronic and incurable; it is not an advantage to have access to health facilities and care once it is contracted. Antiretroviral drugs may be able to prolong

and improve the quality of an HIV patient's life, but she will test positive for the virus whether she is taking the drugs or not. HIV/AIDS is also the only terminal sexually transmitted disease. This mode of transmission means that everyone will likely engage in behavior that could lead to contracting it at some point in their lives. It is not as simple as boiling drinking water or disposing of waste properly. When AIDS is involved, it means researching acts that almost all people perform regardless of their social position. Therefore, even though structural violence may not provide the best framework for understanding the spread of HIV, it may still apply to other diseases.

#### **Practical Implications of Findings**

At the moment, many of the AIDS awareness campaigns in sub-Saharan Africa target poor, uneducated women (AIDS Foundation South Africa 2005). The findings from this research suggest that these campaigns may need to be rethought. While the poor are contracting the disease, it is the relatively wealthy who are most at risk regardless of their education. Therefore, organizations that are aiming to stop or slow the spread of HIV should consider targeting wealthy individuals in their campaigns as well.

The findings related to wealth point to another group that should be included in these campaigns: wealthy men.

In these data wealth was measured by household so all of the women's family members would also be considered wealthy. These women are either exposing their husbands and significant others to the virus or contracting it from them so the men should not be overlooked when trying to educate about HIV/AIDS.

Ethnicity and marital status should also be considered in the future. While ethnicity is rarely noted in a Kenyan's everyday life, it is difficult to ignore data saying that a girl born to a Luo is five times more likely to contract HIV than one born to a Kikuyu. In addition, effort should be put forward to find out why widowed, divorced, and separated women are contracting HIV at such a high rate compared with their never-married and currently married counterparts.

#### **Limitations and Suggestions for Further Research**

There are a number of limitations to the data that are available. First, it is cross-sectional so it is impossible to determine whether and how HIV is spreading. Early researchers suggested that the disease was primarily urban (Kloos, Helmut, Mariam, and Lindtjorn 2007). In this analysis the urban-rural distinction was not significant when wealth was considered, which suggests that it may now be prevalent in poorer rural areas as well. However, the

only accurate method for determining the migration of the disease would be to collect data at multiple points in time.

When testing structural violence and HIV, the DHS's measure of wealth by the household poses two problems. First, wealth is a group-level (household) variable that is used to predict an individual outcome. This mixing of levels may have confounded the findings in this research. A multi-level analysis would have solved this problem and may have given a more accurate picture of the relationship between HIV and wealth. The measure of wealth may also be problematic because it does not give an accurate measure of the resources that are actually available to the women.

At its core, structural violence is about access to resources and power. The assumption in this research is that household wealth increases a woman's agency, although it may not be true. Prior research conducted in Africa indicates that when women become dependent on men financially, they do not feel they have as much ability to negotiate in sexual practices. As Lesley Doyal argues, when there is any form of "sexual/economic exchange... women will be constrained in their attempts to protect themselves--the greater the degree of financial dependence, the greater the constraint" (1994:15). If that concept can be transferred



to Kenya, then it is possible that women in wealthy households may have less agency in some situations than those in poor households. It would be beneficial if future research involving women and HIV included some measure of independent income, and control over that income, rather than only the wealth of the household.

The findings in this research also brought to light some issues regarding ethnicity that should be explored further. For example, the Luo and Luhya both have high rates of interpersonal domestic violence. The two communities are also adjacent to one another in the Western part of the country. Luo women were found to have significantly higher odds of having HIV than Luhya women, however. Future researchers should examine this discrepancy to determine some of the factors that seem to protect Luhya women from the virus, while Luo women so frequently contract it.

As with all quantitative research, this paper helps explain some of the "whos" and "whats" involved in a situation. It also unveils some "whys" that should be asked. Why do wealthy women in Kenya seem to contract HIV at a much higher rate than poor women? Why are widowed women so much more likely to have HIV than married, divorced, or separated women? Why do Somali women have

such low rates of the disease? Why is it that education does not seem to make a difference? These are questions that would best be answered with qualitative studies.

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