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Community Stigma and Discrimination Against Persons Living With HIV/AIDS in Kenya

Catherine Muthoni

COMMUNITY STIGMA AND DISCRIMINATION AGAINST PERSONS LIVING WITH HIV/AIDS IN KENYA

BY
CATHERINE MUTHONI

B.S, KENNESAW STATE UNIVERSITY

A Thesis Submitted to the Graduate Faculty
Of Georgia State University in Partial Fulfillment
Of the
Requirements for the Degree

MASTER OF PUBLIC HEALTH

ATLANTA, GA 30303

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BY

CATHERINE MUTHONI

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CURRICULUM VITAE

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OBJECTIVE

To obtain a position in a highly motivating and challenging environment that will utilize my, educational and professional background, strong organizational skills and provide the best opportunities for growth.

SUMMARY OF QUALIFICATIONS

- Demonstrated ability to design and plan epidemiologic studies and investigations in epidemiology coursework.
- Demonstrated knowledge of steps of an outbreak investigation.
- Demonstrated ability to evaluate the design and function of a surveillance system.
- Demonstrated ability to assess, synthesize and critically evaluate epidemiologic literature for strengths and weaknesses.
- Demonstrated ability to prepare comprehensive reports of study results.
- Demonstrated use of MS Office products (Excel, Access, Word, and PowerPoint) to build presentations and write reports.
- Demonstrated use of SAS to perform statistical data analysis, summarize results and draw conclusions.
- Demonstrated ability to calculate measures of disease frequency and measures of disease association using SAS, and providing interpretation of these measures.
- Demonstrated ability to identify appropriate analytic strategies for various study designs.
- Demonstrated ability to work collaboratively on a team and independently as required guided by commitment to high quality service, performance and accuracy.
- Demonstrated excellent oral and written communication skills.
- Demonstrated ability to work in a fast paced challenging environment that requires team work and delivery of service.
- Demonstrated exceptional organizational skills, dependable and detail-oriented.
- A consistent record of accomplishment and excellent performance.

EDUCATION

Georgia State University, Atlanta, GA — Expected Graduation: December 2016
Master of Public Health
Epidemiology concentration

Kennesaw State University, Kennesaw, GA — December 2007
Bachelor of Science in Psychology

Honors

Dean's List, Kennesaw State University. — December 2007

Major Courses:

Master of Public Health

Epidemiology: Introduction to Epidemiology, Epidemiologic Methods I, Epidemiologic Methods II, Biostatistics with SAS training, Statistical Computing, Infectious Disease Epidemiology, Social and Behavioral Aspects in Public Health, Introduction to Health Care Systems, Environmental Health, Public Health Research Methods, Case Studies in Epidemiology, Health Disparities in Public Health.

Study Abroad: Alcohol and Alcohol-Related Harm in the Global Context: Prevention and Policy Strategies, Kampala, Uganda

- Coursework on Global Epidemiology of alcohol use and alcohol-related harm (including violence, injuries, and HIV) particularly in vulnerable populations.
- Examined public health issues from a global perspective.
- Examined structural drivers of alcohol use and alcohol-related harm including injuries, violence and HIV primarily among youth and young adults.
- Collaboration with local Non- Governmental Organizational partners.

Collaborative Institutional Training Initiative (CITI Program)
Human Subjects Research
Responsible Conduct of Research

WORK EXPERIENCE

Georgia Department of Public Health, Atlanta, GA July 2016-October 2016
NHBS (National HIV Behavioral Surveillance System) Interviewer-HET4

- Screen potential study participants for eligibility, obtain informed consent and conduct HIV behavioral risk factor interviews.
- Accurately document participant information for the eligibility screener, consent form, questionnaire and participant tracking form.
- Comply with guidelines for maintaining data integrity and security, participant confidentiality and safety.
- Provide recruiter training in great detail at the end of the survey.
- Assist with ongoing formative research.

Georgia Department of Public Health, Atlanta, GA January 2016-July 2016
Resource Development and Community Partnership Intern -TB Division
Responsible for the development of strategies for identifying, approaching and educating medical providers, other state programs, community partners, personal cares homes, pharmacies regarding the medical and mental health needs of TB patients.
Development of a resource database using excel and a resources manual for the use of the TB program and the nurses at the state and district level.

VOLUNTEER EXPERIENCE

- Atlanta Harm Reduction Coalition, Inc.
  Assisted in giving free HIV testing and community outreach in underserved communities.
- Must Ministries, Marietta, GA
  Assisted in food pantry and kitchen, organized and distributed donations.
- Caribbean Lifetime Missions, Acworth, GA
  Assisted in administrative duties and community outreach.

OFFICE SKILLS

- High proficiency in Windows XP, Vista, Windows 7 and 8, Microsoft Office 2003, 2007 and 2010
- High Proficiency in SAS.
- Excellent organizational, communication skills and meticulous attention to detail.
- Strong analytical and writing skills.

ORGANIZATIONS

- Georgia State University Public Health Student Association.

LANGUAGES

- English and Swahili

Abstract

Introduction:

HIV/AIDS is a significant public health problem. An estimated 36.7 million people in the world are living with HIV/AIDS, and the largest burden of HIV/AIDS is in sub-Saharan Africa, where approximately 25.6 million people are living with HIV/AIDS, accounting for approximately 70% of the people infected with HIV/AIDS worldwide. The purpose of this study is to examine associated factors among persons who exhibit stigma and discrimination against people living with HIV/AIDS in Kenya.

Methods:

Secondary data with a probability sample of 11,909 participants who took part in the 2008-2009 Kenya Demographic Health Survey were analyzed. Logistic regression models and ordinal logistic regression models were conducted to examine associated factors among persons who exhibit stigma and discrimination against people living with HIV/AIDS in Kenya. The factors examined included age, sex, education, wealth quintile, marital status, literacy, and knowledge of HIV/AIDS transmission. All analyses accounted for complex sampling design. All analyses were performed using SAS 9.4.

Results

Overall, the majority (74%) of respondents indicated that they were willing to buy vegetables from a vendor with HIV/AIDS, and the majority (96%) reported that they would be willing to care for family members with AIDS. Approximately 51.6% of persons with primary education (95%CI: 50.4-52.9) were willing to care for a family member with AIDS in the household compared to 5.4% persons with no education (95% CI: 0.2-4.9). Primary education was significantly associated with being willing to buy vegetables from a vendor with HIV/AIDS (OR: 3.5; 95% CI: 2.9-4.2) compared to no education. Persons in the "richest" wealth index (OR: 2.6; 95% CI: 1.9-3.4) were more likely to report that a female teacher with AIDS should be allowed to teach, compared to persons in the poorer wealth index. No association was detected between marital status and exhibiting stigma and discrimination. Persons with correct perceptions of HIV exhibited lower levels of stigma and discrimination compared to persons with incorrect perceptions of HIV.

Conclusion:

These findings highlight the importance of educating individuals and communities on the risks of stigmatizing attitudes toward PLWHA. Education may promote acceptance and understanding, which may ultimately affect people's attitudes, behaviors and opinions towards PLWHA.

Key Words: Stigma, discrimination, Persons Living with HIV/AIDS (PLWHA), HIV

Abstract Word Count: 353

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CHAPTER I: Introduction

1.1 Background

HIV/AIDS is a significant public health problem. An estimated 36.7 million people in the world are living with HIV/AIDS, and the largest burden of HIV/AIDS is in sub-Saharan Africa, where approximately 25.6 million people are living with HIV/AIDS, accounting for approximately 70% of the people infected with HIV/AIDS worldwide (World Health Organization). Stigma and discrimination against people living with HIV/AIDS (PLWHA) may exacerbate adverse health outcomes, including reduced adherence to anti-retroviral medications (ARTs). Kingori et al. (2013) defines stigma as behavior that is generally associated with denial, embarrassment, or guilt, and is commonly directed towards PLWHA in the society. Parker and Aggleton (2003) theorize stigma as "a social process that operates at the intersection of culture, power, and difference." Persons living with HIV/AIDS are faced with daily stigma and discrimination in the society, particularly in developing countries. This is primarily due to misconceptions about the transmission of HIV/AIDS (Dahlui et al. 2015). PLWHA experience stigma and discrimination in various aspects of their lives that also affect their well-being.

The high burden of HIV in sub-Saharan Africa and the strong associations among stigma, discrimination, and adverse health outcomes among people living with HIV is a public health problem. Kenya ranks 11th in HIV rates in sub-Saharan Africa (6.3% HIV prevalence) (Kenya Demographic Health Survey, 2008-2009). The high levels of HIV warrant investigation into the stigma and discrimination exhibited by the community towards people living with HIV/AIDS. To date, no study has examined associated factors among persons who exhibit stigma and discrimination against people living with HIV/AIDS in Kenya using a nationally representative sample. The research questions that inform this study are:

1. What is the prevalence of stigma and discrimination towards people living with HIV/AIDS in Kenya?
2. What are the characteristics of persons who report stigma and discrimination towards people living with HIV/AIDS in Kenya?

These research questions will be answered using the Demographic Health Survey dataset 2008-2009 from Kenya.

1.2 Purpose of the study

The purpose of this study is to examine associated factors (age, sex, education, literacy, wealth quintile, marital status, and knowledge of HIV/AIDS transmission) among persons who exhibit stigma and discrimination against people living with HIV/AIDS in Kenya using the Kenya Demographic Health Survey (2008-2009). This study will account for complex sampling design and examine stigma and discrimination in multiple models. There are four questions that examine stigma and discrimination exhibited towards people living with HIV/AIDS assessed in the Demographic Health Survey in Kenya. Each of these questions will be assessed as an outcome in four separate bivariate and multivariable logistic regression models. Additionally, stigma and discrimination will be summed to create a composite score. An ordinal logistic regression analysis will then be utilized to assess associated factors with the four levels of exhibiting stigma and discrimination compared to not exhibiting stigma and discrimination.

1.3 Hypotheses

The research hypothesis is that stigma and discrimination are significantly associated with older age, being male, lower educational status, lower wealth status, being married, and incorrect perceptions of HIV knowledge and transmission.

CHAPTER II: Literature Review

HIV/AIDS is a significant public health problem. HIV affects 36.7 million people globally, and sub-Saharan Africa is the most affected, where approximately 25.6 million people are living with HIV/AIDS, accounting for approximately 70% of the people infected with HIV/AIDS worldwide (World Health Organization). One of the barriers to treatment for HIV positive persons is the stigma and discrimination that may prevent HIV-positive persons from seeking HIV treatment and testing. Stigma and discrimination against people living with HIV/AIDS (PLWHA) may exacerbate adverse health outcomes, including reduced adherence to anti-retroviral medications (ARTs). Kingori et al. (2013) defines stigma as behavior that is generally associated with denial, embarrassment, or guilt, and is commonly directed towards PLWHA in the society. Persons living with HIV/AIDS are faced with daily stigma and discrimination in the society, particularly in developing countries (Kingori et al., 2013).

Women are disproportionately infected with HIV/AIDS in sub-Saharan Africa and experience higher levels of stigma and discrimination compared to men (Nelson and Williams, 2014). Nelson and Williams (2014) reported that there are higher rates of HIV infections among young women between the ages of 15-24 years. This has consequently increased the rate of infant and childhood HIV infections. The ratio of female to male HIV infections is about 1.3 to 1.0 in sub-Saharan Africa (Nelson and Williams, 2014). Most women living in rural areas in sub-Saharan deliver their infants at home and many do not receive prenatal care due to limited access to health care and HIV services (Nelson and Williams, 2014). Most women are also afraid of HIV testing because of the stigma surrounding HIV/AIDS (Nelson and Williams, 2014). There is also a high incidence rate of HIV in pregnant and lactating women because most women

discontinue contraception. Nelson and Williams (2014) go further to report that the HIV prevalence among persons 15-24 years is more than twice as great among females (3.3%) compared to males (1.4%). The authors suggest that this indicates sexual patterns where older men have sex with younger women and may be an indication of gender inequality, cultural gender roles, intimate partner violence and the consequences of having unprotected sex due to using hormonal contraceptives (Nelson and Williams, 2014).

A study conducted in Kenya found that women who were infected with HIV were viewed as promiscuous and immoral which further increases stigma and discrimination thus preventing them from seeking treatment or adhering to treatment (Kingori et al., 2012). There are different types of stigma associated with HIV/AIDS, specifically, internalized stigma, anticipated stigma, and enacted stigma. Internalized stigma occurs when a person internalizes feelings of humiliation or guilt due to their adverse societal discrimination because of their HIV/AIDS status. Anticipated stigma is the undesirable response persons living with HIV/AIDS presume they will get from their family and community if they disclose their HIV/AIDS status (Mhode et al., 2016). Enacted stigma occurs when persons living with HIV/AIDS are intentionally discriminated against because of their status (Mhode et al., 2016).

A study conducted in rural western province in Kenya found that older women who were less educated, married to husbands with multiple wives, and who had observed their community discriminating against people with HIV were more likely to anticipate HIV stigma if they were ever diagnosed with HIV (Cuca et al., 2012). This also applied to pregnant women in polygamous relationships. Women in polygynous relationships are more likely to have less power and stability which may result in non-disclosure of their HIV status to others. The authors state that men in polygamous relationships are more likely to engage in risky sexual behaviors

and tend to have more control over sexual practices in their relationships. Women who have less power, authority or influence in their communities are more likely to experience stigma due to their HIV/AIDS status and are less likely to seek treatment or disclose their status to anyone (Cuca et al., 2012). Women are also more susceptible to HIV infection, and are also more likely to experience stigma or be held responsible for its transmission (Lekas et al 2006).

As mentioned earlier, several adverse consequences are linked to stigma and discrimination among people living with HIV/AIDS (PLWHA) (Kingori et al. 2012). Medication and treatment adherence, safe sex practices such as condom use, disclosure of HIV/AIDS status and general well-being are all affected by the stigma and discrimination experienced by PLWHA. PLWHA are often afraid to disclose their status for fear of being discriminated against when seeking employment, health care services, intimate relationships, marriage or interacting in the society (Kingori et al. 2012). Another study found that PLWHA who experience stigma may delay treatment or have poor treatment adherence (Chan et al., 2015). HIV stigma and discrimination against PLWHA is highly dependent on education in the society (Tsai, 2015).

A Nigerian study found that PLWHA were held responsible for introducing HIV/AIDS into the community (Dahlui et al., 2015). The study found that males and younger persons with less education and of a lower economic status were more likely to discriminate against PLWHA (Dahlui et al., 2015). The study also found that women and persons with a high education level and of a higher social economic status were more compassionate towards PLWHA (Dahlui et al., 2015). The authors suggest that this attitude is influenced by an advanced cognizance among those who are highly educated and of a higher social economic status of the diagnosis and treatment of PLWHA (Dahlui et al. 2015).

This study utilized data from the 2013 Nigeria Demographic and Health Survey (DHS) (Dahlui et al., 2015). The total sample size consisted of 56,307 men and women living in Nigeria ages 15–49 (Demographic Health Survey, 2013).

The researchers performed a secondary data analysis of the Nigerian DHS (Dahlui et al., 2015). The study implemented gender specific questions on HIV/AIDS. The questionnaires also consisted of questions on stigma and discrimination towards PLWHA, acceptance on various issues pertaining to stigma and discrimination such as willingness to care for relatives, inclination to buy vegetables from an HIV-infected vendor, discrimination towards female infected teacher, perception on whether HIV positive people should be ashamed of themselves and perception on whether HIV infected people should be blamed for bringing the disease to the community. Socio-demographic data such as age, highest educational attainment, marital status and household monthly income was also collected. The researchers assessed demographic characteristics of participants, gender differences on HIV stigma and discrimination, and assessed factors associated with exhibiting HIV stigma and discrimination against PLWHA (Dahlui et al., 2015).

The study found that married persons were more likely to have stigma towards PLWHA in addition to blaming PLWHA for introducing HIV into the community (Dahlui et al., 2015). The study found that more females (30%; 95% CI: 30%, 31%) had been tested for HIV compared to males (22%; 95% CI: 21%, 23%) (Dahlui et al., 2015). More women (62%; 95% CI: 61%, 62%) preferred to keep HIV infection a secret compared to 50% (95% CI: 49%, 51%) among men (Dahlui et al., 2015). HIV stigma was assessed using two questions: “Should people with HIV be ashamed of themselves?” and, “Should people with HIV be blamed for bringing the disease into the community?” Discrimination was evaluated through three questions; “whether

female teachers infected with HIV, but are not sick, should be allowed to continue teaching, willingness to care for a relative with AIDS and willingness to buy vegetables from a vendor with HIV" (Demographic Health Survey, 2013). Approximately 70% of the population was willing to care for relatives infected with HIV/AIDS (Dahlui et al., 2015). Approximately 50% of the population thought that PLWHA should be ashamed of themselves and should be blamed for bringing the disease to the community, and the level of agreement was slightly higher among the males compared to the females (about 60% vs 50%) (Dahlui et al., 2015). The researchers found that respondents who were younger, ages 11-30 years of age, (OR=1.2, 95% CI: 1.1-1.3) were more likely to report that people with HIV should be ashamed of themselves compared to older respondents of 31-50 years of age (Dahlui et al., 2015). Younger respondents were also more likely to report that people with HIV should be blamed for bringing disease to the community (OR=1.3, 95% CI: 1.3-1.4) (Dahlui et al., 2015). Males were more likely to report HIV stigma on both measures, including people with HIV should be ashamed of themselves (OR=1.8, 95% CI: 1.7-1.8) and people with HIV should be blamed for bringing disease in the community (OR=1.1, 95% CI: 1.7-1.8) (Dahlui et al., 2015). Respondents with lower educational status, including no formal education and primary education compared to secondary education and higher, were also more likely to report exhibiting stigma against PLWHA (Dahlui et al., 2015). Respondents with middle and low wealth status were also significantly associated with exhibiting HIV stigma compared to respondents who were classified in the rich wealth index (Dahlui et al., 2015).

The study found that approximately 70% of the Nigerian population is willing to care for a relative with AIDS (Dahlui et al., 2015). For the discrimination measures, older ages (31-50 years of age) were significantly associated with acceptance of PLWHA (teachers with HIV

should be allowed to teach, willing to care for relative with AIDS, and would buy vegetables from a vendor with HIV) (Dahlui et al., 2015). Moreover, respondents in the middle and rich wealth indexes were also more accepting of PLWHA and reporting lower levels of HIV discrimination (Dahlui et al., 2015). Higher levels of education (secondary and higher) were significantly associated with lower HIV discrimination compared to primary education (Dahlui et al., 2015). Higher literacy levels were associated with being more accepting of PLWHA who were selling vegetables, but this association was not detected for the measures regarding female teachers living with HIV and willing to care for relatives with AIDS (Dahlui et al., 2015). Respondents who were married were more accepting of female teachers living with HIV and purchasing vegetables from vendors with HIV, but this association was not significant for the measure about willing to care for relatives with AIDS (Dahlui et al., 2015).

Tsai (2015) conducted a secondary data analysis using a pooled dataset from the Demographic health survey (DHS) of PLWHA in Cameroon, Ethiopia, Gabon, Kenya, Lesotho, Malawi, Rwanda, Swaziland, Tanzania, Uganda, Zambia, and Zimbabwe. Contrary to the Nigerian study (Dahlui et al., 2015), this study aimed to estimate the incidence of internalized stigma among persons with HIV who were aware of their HIV status as opposed to examining the entire country's stigma and discrimination towards PLWHA. The researcher also sought to evaluate the differences in stigma by wealth. Internalized stigma was the primary outcome of interest in the study (Tsai, 2015).

Stigma and discrimination were evaluated using three questions similar to the Dahlui et al. (2015) Nigerian study. The questions were: "Would you buy fresh vegetables from a shopkeeper or vendor if you knew that this person had the AIDS virus?"; "If a member of your family became sick with the virus that causes AIDS, would you be willing to care for her or him

in your own household?"; and "In your opinion, if a female teacher has the AIDS virus but is not sick, should she be allowed to continue teaching in the school? (Tsai, 2015)."

The data was analyzed using sensitivity analysis and regression models (Tsai, 2015). In the countries included in the pooled dataset, approximately 20% of PLWHA had responses consistent with internalized stigma (Tsai, 2015). The study found that there was an inverse association at the country level, between HIV associated stigma in the community and internalized stigma experienced by PLWHA (Tsai, 2015). This association was not statistically significant. The study also found that internalized stigma among PLWHA was greater among those of a lower socio-economic status compared to those with a higher economic status (Tsai, 2015). PLWHA living in the poorest households were twice as more likely to report internalized stigma compared to persons living in the wealthiest households (Tsai, 2015). The author states that wealth and education may be protective factors against internalized stigma. Persons in the lowest wealth index have a lack of resources and inadequate education which consequently leads to worse health outcomes resulting from HIV stigma (Tsai, 2015).

PLWHA are more likely to isolate themselves from the community when faced with stigma and discrimination which consequently influences their quality of life. PLWHA experience criticism and exclusion from friends, family and the community because of their HIV status (Dahlui et al., 2015). PLWHA are more likely to practice safe sex and be honest about their HIV status when they are surrounded by a community that shows empathy toward them (Dahlui et al., 2015). PLWHA face stigma and discrimination from the government, society, health care workers, employers, family members and colleagues (Dahlui et al., 2015). PLWHA experience isolation, low self-worth, individuality crises and disinterest in HIV/AIDS prevention. In addition to disinterest in HIV/AIDS prevention practices they are less likely to

seek treatment (Dahlui et al., 2015). Pregnant women infected with HIV are more likely to circumvent HIV/AIDS advising and testing (Dahlui et al., 2015). HIV/AIDS stigma increases the incidence of HIV/AIDS by preventing the provision of effective social and medical support because PLWHA are afraid of disclosing their status (Dahlui et al., 2015). PLWHA are constantly faced with hostility, unemployment, access to excellent treatment and discrimination in health care settings (Dahlui et al., 2015).The researchers also state that PLWHA are less likely to have safe sex practices and to keep their HIV status a secret when faced with stigma and discrimination. Poor access to health care, specifically for PLWHA impacts HIV treatment and prevention (Dahlui et al., 2015).

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CHAPTER III: Manuscript

COMMUNITY STIGMA AND DISCRIMINATION AGAINST PERSONS LIVING WITH HIV/AIDS IN KENYA

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Abstract

Introduction:

HIV/AIDS is a significant public health problem. An estimated 36.7 million people in the world are living with HIV/AIDS, and the largest burden of HIV/AIDS is in sub-Saharan Africa, where approximately 25.6 million people are living with HIV/AIDS, accounting for approximately 70% of the people infected with HIV/AIDS worldwide. The purpose of this study is to examine associated factors among persons who exhibit stigma and discrimination against people living with HIV/AIDS in Kenya.

Methods:

Secondary data with a probability sample of 11,909 participants who took part in the 2008-2009 Kenya Demographic Health Survey were analyzed. Logistic regression models and ordinal logistic regression models were conducted to examine associated factors among persons who exhibit stigma and discrimination against people living with HIV/AIDS in Kenya. The factors examined included age, sex, education, wealth quintile, marital status, literacy, and knowledge of HIV/AIDS transmission. All analyses accounted for complex sampling design. All analyses were performed using SAS 9.4.

Results

Overall, the majority (74%) of respondents indicated that they were willing to buy vegetables from a vendor with HIV/AIDS, and the majority (96%) reported that they would be willing to care for family members with AIDS. Approximately 51.6% of persons with primary education (95%CI: 50.4-52.9) were willing to care for a family member with AIDS in the household compared to 5.4% persons with no education (95% CI: 0.2-4.9). Primary education was significantly associated with being willing to buy vegetables from a vendor with HIV/AIDS (OR: 3.5; 95% CI: 2.9-4.2) compared to no education. Persons in the "richest" wealth index (OR: 2.6; 95% CI: 1.9-3.4) were more likely to report that a female teacher with AIDS should be allowed to teach, compared to persons in the poorer wealth index. No association was detected between marital status and exhibiting stigma and discrimination. Persons with correct perceptions of HIV exhibited lower levels of stigma and discrimination compared to persons with incorrect perceptions of HIV.

Conclusion:

These findings highlight the importance of educating individuals and communities on the risks of stigmatizing attitudes toward PLWHA. Education may promote acceptance and understanding, which may ultimately affect people's attitudes, behaviors and opinions towards PLWHA.

Key Words: Stigma, discrimination, Persons Living with HIV/AIDS (PLWHA), HIV

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Introduction

HIV/AIDS is a significant public health problem. HIV affects 36.7 million people globally, and sub-Saharan Africa is the most affected, where approximately 25.6 million people are living with HIV/AIDS, accounting for approximately 70% of the people infected with HIV/AIDS worldwide (World Health Organization). One of the barriers to treatment for HIV positive persons is the stigma and discrimination that may prevent HIV-positive persons from seeking HIV treatment and testing (World Health Organization). Stigma and discrimination against people living with HIV/AIDS (PLWHA) may exacerbate adverse health outcomes, including reduced adherence to anti-retroviral medications (ARTs) (Kingori et al., 2013). Kingori et al. (2013) defines stigma as behavior that is generally associated with denial, embarrassment, or guilt, and is commonly directed towards PLWHA in the society. Persons living with HIV/AIDS are faced with daily stigma and discrimination in the society, particularly in developing countries (Kingori et al., 2013).

Stigma and discrimination against PLWHA may exacerbate adverse health outcomes, including reduced adherence to anti-retroviral medications (ARTs). Stigma and discrimination may also discourage safe sex practices such as condom use, disclosure of HIV/AIDS status and affect the PLWHA general well-being. When faced with stigma and discrimination, PLWHA experience loneliness, low self-worth, individuality crises and disinterest in HIV/AIDS prevention (Dahlui et al., 2015).

Pregnant women infected with HIV are more likely to avoid HIV/AIDS advising and testing when faced with stigma and discrimination (Dahlui et al., 2015). HIV/AIDS stigma increases the incidence of HIV/AIDS by preventing the provision of effective social and medical support because PLWHA are afraid of disclosing their status (Dahlui et al., 2015). PLWHA are

constantly faced with hostility, unemployment, access to excellent treatment and discrimination in health care settings (Dahlui et al., 2015).

A Nigerian study found that PLWHA were held responsible for introducing HIV/AIDS into the community (Dahlui et al., 2015). The study found that males and younger persons with less education and of a lower economic status were more likely to discriminate against PLWHA (Dahlui et al., 2015). The study also found that women and persons with a high education level and of a higher social economic status were more compassionate towards PLWHA (Dahlui et al., 2015). The authors suggest that this attitude is influenced by an advanced cognizance among those who are highly educated and of a higher social economic status of the diagnosis and treatment of PLWHA (Dahlui et al. 2015).

Tsai (2015) conducted a secondary data analysis using a pooled dataset from the Demographic health survey (DHS) of PLWHA Cameroon, Ethiopia, Gabon, Kenya, Lesotho, Malawi, Rwanda, Swaziland, Tanzania, Uganda, Zambia, and Zimbabwe. Contrary to the Nigerian study (Dahlui et al., 2015), this study aimed to estimate the incidence of internalized stigma among persons with HIV who were aware of their HIV status as opposed to examining the entire country's stigma and discrimination towards PLWHA. The researcher also sought to evaluate the differences in stigma by wealth. Internalized stigma was the primary outcome of interest in the study (Tsai, 2015).

The study found that there was an inverse association at the country level, between HIV associated stigma in the community and internalized stigma experienced by PLWHA (Tsai, 2015). The study also found that internalized stigma among PLWHA was greater among those of a lower socio-economic status compared to those with a higher economic status (Tsai, 2015). PLWHA living in the poorest households were twice as more likely to report internalized stigma

compared to persons living in the wealthiest households (Tsai, 2015). The author states that wealth and education may be protective factors against internalized stigma. Persons in the lowest wealth index have a lack of resources and inadequate education which consequently leads to worse health outcomes resulting from HIV stigma (Tsai, 2015).

Few studies have been done to examine people exhibiting stigma in Kenya, and no study to our knowledge has examined associated factors among persons who exhibit stigma and discrimination against people living with HIV/AIDS in Kenya using a nationally representative sample. The purpose of this study is to examine the prevalence and associated factors with exhibiting stigma and discrimination against PLWHA in Kenya using a nationally representative sample from the Demographic Health Survey (2008-2009).

Methods

Sample and Data Source

The Demographic and Health Surveys (DHS) are nationwide representative surveys that provide a wide range of data in various public health arenas such as population, well-being, and sustenance. For this study, a secondary data analysis was conducted using the 2008-2009 Kenya Demographic and Health Survey (KDHS), a nationwide representative sample survey of 8,444 women ages 15 to 49 and 3,465 men ages 15 to 54 chosen from 400 sample clusters throughout Kenya. The total sample yielded 11,909 respondents (unweighted N).

Measures

Independent Variables

The independent variables examined included age, gender, education, wealth quintile, marital status, literacy and knowledge of HIV/AIDS transmission. These factors were ascertained from the literature as previously associated factors with persons exhibiting stigma and discrimination

against PLWHA (Dahlui et. al, 2015; Tsai, 2015). Age was measured as a continuous variable. Gender was dichotomized into male and female. Wealth was measured using five categories. Education was measured as "no education," "primary education," and "secondary education or higher." Knowledge of HIV/AIDS transmission was categorized into "Incorrect knowledge of HIV/AIDS transmission" or "Correct knowledge of HIV/AIDS transmission." This variable was assessed using the following questions from the DHS dataset:

1. Can people reduce their chance of getting the AIDS virus by having just one uninfected sex partner who has no other sex partners?
2. Can people get the AIDS virus from mosquito bites?
3. Can people reduce their chance of getting the AIDS virus by using a condom every time they have sex?
4. Can people get the AIDS virus by sharing food with a person who has AIDS?
5. Can people get the AIDS virus because of witchcraft or other supernatural causes?
6. Is it possible for a healthy-looking person to have the AIDS virus?

If a respondent answered at least one question that corresponded to an incorrect perception of HIV/AIDS transmission, the respondent was categorized as "Incorrect knowledge of HIV/AIDS transmission." If a respondent correctly answered all questions regarding knowledge of HIV/AIDS transmission, the respondent was categorized as "Correct knowledge of HIV/AIDS transmission."

Dependent Variables

Stigma and discrimination was assessed using four questions:

1. Would you buy fresh vegetables from a shopkeeper or vendor if you knew that this person had the AIDS virus?

2. If a member of your family got infected with the AIDS virus, would you want it to remain a secret or not?
3. If a member of your family became sick with the virus that causes AIDS, would you be willing to care for her or him in your own household?
4. In your opinion, if a female teacher has the AIDS virus but is not sick, should she be allowed to continue teaching in the school?

Respondents could answer "Yes" or "No" to each of these questions. All four outcomes were assessed in four separate logistic regression models. The referent outcome category for each separate logistic regression model was the answer "No" to the question.

In addition, an outcome variable was created by calculating a composite score from the four measures. The referent group was categorized as exhibiting no stigma and discrimination on all four questions. Respondents were classified as *exhibiting stigma* if answered "No" to questions, "Would you buy vegetables from vendor you knew had AIDS virus?"; "Willing to care for family member with AIDS in the household?"; and "Should female teacher with AIDS but not sick be allowed to teach?" Respondents were classified as *exhibiting stigma* if answered "Yes" to question, "Would you want the HIV status of family member to be a secret?" Respondents were given 1 point for all questions answered exhibiting stigma, and the outcome was categorized into 0-4, with 4 exhibiting the highest level of stigma and 0 (referent group) exhibiting no stigma.

Statistical Analyses

All statistical analyses were conducted using SAS 9.4 (SAS Institute, Inc., Cary, NC). Descriptive statistics among persons exhibiting stigma and discrimination were determined. Bivariate and multivariable logistic regressions were conducted to assess associations of

exhibiting stigma and discrimination towards PLWHA. Ordinal logistic regressions were also conducted to assess associations of exhibiting stigma and discrimination towards PLWHA. All analyses accounted for complex sampling design.

Results

Demographic characteristics displayed in Table 1 indicate differences in levels of exhibiting stigma and discrimination towards PLWHA in Kenya. Overall, the majority (74%) of respondents indicated that they were willing to buy vegetables from a vendor with HIV/AIDS, and the majority (96%) reported that they would be willing to care for family members with AIDS. Nearly half of respondents (45%) reported they would want to keep the HIV-positive status of a family member a secret. Additionally, the majority (82%) also reported that a female teacher with HIV/AIDS should be allowed to teach. Females had a higher percentage of reporting exhibiting stigma and discrimination compared to men. Approximately 22.2% of females (95% CI: 21.2-23.2) responded that they would not buy vegetables from a vendor they knew had the AIDS virus compared to 6.0% (95% CI: 5.4-6.6) males. Approximately 51.6% of persons with primary education (95%CI: 50.4-52.9) were more willing to care for a family member with AIDS in the household compared to 5.4% persons with no education (95% CI: 0.2-4.9). Stigma and discrimination also varied across the wealth index. Approximately 24.6% (95% CI: 23.9-25.4) persons in the highest wealth index responded “yes” to whether a female teacher with AIDS but not sick should be allowed to teach compared to 9.2% (CI: 8.5-9.8) among the lowest wealth index. There were no observable differences in marital status across the different stigma and discrimination questions. A lower percentage of literate persons reported exhibiting stigma and discrimination compared to those who were not literate. This was consistent across all measures of stigma and discrimination. For instance, approximately 83.4% (CI: 82.6-84.3)

persons who were literate were willing to care for a family member with AIDS in the household compared to 9.9% (CI: 9.2-10.6) persons who were not literate.

Results from the bivariate and multivariable associations of exhibiting stigma and discrimination towards PLWHA in Kenya are displayed in Table 2. In the first adjusted model, females reported a reduced odds of responding "Yes" to the question about being willing to buy vegetables from vendors with HIV (OR: 0.7; 95% CI: 0.6-0.8), indicating that females were more likely to report exhibiting stigma and discrimination compared to males. In addition, females were also more likely to report wanting to keep the HIV-positive status of a family member secret compared to males (OR: 2.1; 95% CI: 1.8-2.4) in the adjusted model, also indicating that females were more likely to exhibit stigma and discrimination compared to males. In the bivariate analyses, higher levels of education were associated with not reporting stigma and discrimination. For example, primary education was significantly associated with being willing to buy vegetables from a vendor with HIV/AIDS (OR: 3.5; 95% CI: 2.9-4.2). When adjusting for other covariates in the adjusted models, higher education was associated with a reduced odds of being willing to buy vegetables from a vendor with HIV/AIDS (OR: 0.3; 95% CI: 0.2-0.4). However, higher education was associated with reduced odds of wanting to keep a family member's HIV-positive status a secret in the unadjusted model; however, this association was not statistically significant in the adjusted model for this outcome. A one-year increase in age corresponded with a slightly increased odds of being willing to buy vegetables from a vendor with HIV/AIDS, willing to care for family member with HIV/AIDS, and agreeing that a female teacher with HIV/AIDS be allowed to teach.

Higher levels of wealth were significantly associated with reporting not exhibiting stigma and discrimination towards PLWHA. Persons in the "poorer" wealth index (OR: 1.4; 95% CI:

1.1-1.7) thought that a female teacher with AIDS should be allowed to teach compared to persons in the "poorest" wealth index. Additionally, persons in the "richest" wealth index (OR: 2.6; 95% CI: 1.9-3.4) were more likely to report that a female teacher with AIDS should be allowed to teach, compared to persons in the poorest wealth index. No association was detected between marital status and exhibiting stigma and discrimination. Persons who were literate were more likely to not exhibit stigma and discrimination. For example, in the adjusted model, literacy was associated with being willing to buy vegetables from a vendor with HIV/AIDS (OR: 1.4; 95% CI: 1.1-1.8) compared to illiteracy. Having correct perceptions of HIV was significantly associated with reporting no stigma and discrimination compared to persons with incorrect perceptions of HIV. In the adjusted model, persons with correct perceptions of HIV were more likely to report being willing to care for a family member with AIDS (OR: 1.7; 95% CI: 1.4-2.2) compared to persons with incorrect perceptions of HIV.

The results from the ordinal logistic regression are presented in Table 3. In the multivariable model, females were more likely to report exerting higher levels of stigma (level 4 OR: 3.0; 95% CI: 1.5- 5.9) compared to males. Persons with primary education and secondary education were also more likely to exert higher levels of stigma compared to persons with no education. For example, primary education was significantly associated with exerting the highest level of stigma (OR: 7.9; 95% CI: 1.6-39.6) compared to no education. Additionally, secondary education was also significantly associated with exerting the highest level of stigma (OR: 5.4; 95% CI: 1.4-21.2) compared to no education. Higher education was not associated with exerting any level of stigma. Older ages were associated with reduced odds of exerting stigma (level 4 OR: 0.9; 95% CI: 0.9-1.0). Higher levels of wealth were significantly associated with reduced odds of exerting stigma. The richest wealth index was significantly with reduced odds of

exerting the highest level of stigma (OR: 0.2; 95% CI: 0.1-0.5). Moreover, the "poorer" wealth index was not significantly associated with exerting any level of stigma compared to the poorest wealth index. Being married was not significantly associated with any level of exerting stigma. Individuals who were literate had reduced odds of exerting any level of stigma compared to individuals who were not literate. However, this association was statistically significant for all levels except for level 3 (OR: 0.4; 95% CI: 0.3-0.6). Persons with correct perceptions of HIV exhibited lower levels of stigma and discrimination compared to persons with incorrect perceptions of HIV.

Discussion

This study highlights how stigma and discrimination manifests itself in the community consequently impacting efforts towards HIV/AIDS treatment and prevention. A relatively high percentage of people reported not exhibiting stigma and discrimination towards vendors with HIV/AIDS and teachers with HIV/AIDS. However, nearly half of respondents reported they would want the HIV-positive status of a family member to remain a secret. This result indicates that stigma and discrimination against PLWHA remains prevalent in the community. This study also indicated that females were more likely to report higher levels of stigma compared to men. Higher levels of wealth were significantly associated with exhibiting lower levels of stigma. Persons who were literate had reduced odds of exhibiting stigma compared to those who were not literate for all measures of stigma. Marital status had no significant association with the different levels of stigma and discrimination. Persons with correct perceptions of HIV exhibited lower levels of stigma and discrimination compared to persons with incorrect perceptions of HIV.

This study's findings are mostly consistent with the reviewed literature, particularly the Nigerian study where they found that younger persons, persons with lower education, and persons with a lower economic status were more likely to discriminate against PLWHA (Dahlui et al., 2015). However, the Nigerian study found that women were more compassionate towards PLWHA (Dahlui et al., 2015). These results are slightly contradictory to this study's results, which reported that females exerted more stigma and discrimination compared to males. Reasons for these differences could be attributed to cultural differences or other underlying differences. Future studies should also investigate gender norms in relation to exhibiting stigma and discrimination against PLWHA in a community.

This study's findings are also consistent with Tsai's 2015 study. Tsai (2015) found that internalized stigma among PLWHA was greater among those of a lower socio-economic status compared to those with a higher economic status (Tsai, 2015). PLWHA living in the poorest households were twice as more likely to report internalized stigma compared to persons living in the wealthiest households (Tsai, 2015). The author hypothesized that wealth and education may be protective factors against internalized stigma.

Limitations

Several limitations exist in this study. The sample size of 11,909 may not accurately represent the views of persons at the national level despite the survey being nationally representative. The age cap of 49 years in women and 54 years in men may have excluded a large proportion of data from older persons. As with any study conducting secondary data analysis, reporting bias may have occurred during data collection. There is a high likelihood that response bias was present in the study given the nature of the type of questions asked and attitude towards HIV/AIDS.

Implications and Recommendations

Stigma and discrimination impedes HIV/AIDS treatment and prevention in the community and interventions are necessary to reduce their impact. Interventions from the individual level to the policy level are necessary for decreasing the rate of HIV and AIDS transmission. Education on the risks of stigmatizing attitudes toward PLWHA may promote acceptance and understanding and change people's attitudes, behaviors and opinions. Inclusive, accommodating and educated social networks are essential in HIV/AIDS prevention efforts. Education on HIV/AIDS and acceptance of PLWHA is necessary in occupational settings to prevent discrimination and unfavorable work conditions. The Communities can advance their HIV/AIDS prevention efforts by improving access to medical and preventative care.

Future studies should focus on educating communities on the importance of eradicating stigma and discrimination in the communities as a vital step towards HIV/AIDS treatment and prevention efforts. Examining HIV/AIDS prevalence after successful implementation of education would be a good measure of reduced stigma and discrimination.

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Table 1: Demographics among persons exhibiting stigma and discrimination in Kenya

	Would buy vegetables from vendor you knew had AIDS Virus				Willing to care for family member with AIDS in the household				Would want HIV + status of family member to remain a secret				Should female teacher with AIDS but not sick be allowed to teach			
	N*		Percentage (95% CI)		N*		Percentage (95% CI)		N*		Percentage (95% CI)		N*		Percentage (95% CI)	
	Yes	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
Gender Male	2643	783	23.33% (22.21-24.45)	6.00% (5.43-6.56)	3177	162	28.07% (26.88-29.26)	1.29% (1.03-1.55)	922	2317	7.80% (7.15-8.44)	20.94% (19.85-22.03)	2676	675	23.92% (22.78-25.07)	5.41% (4.87-5.95)
Female	5545	2707	48.49% (47.20-49.77)	22.18% (21.17-23.20)	7383	765	65.24% (64.00-66.50)	5.40% (4.86-5.94)	3635	4441	31.37% (30.13-32.62)	39.90% (38.58-41.20)	6262	1827	55.60% (54.29-56.91)	15.06% (14.16-15.98)
Age (15-54)	8188	3490	28.89 (9.79)	28.62 (10.22)	10560	927	28.94 (9.91)	27.27 (9.80)	4557	6758	27.54 (9.78)	29.60 (9.92)	8938	2502	28.88 (9.81)	28.27 (10.20)
Education No Education	424	934	2.64% (2.26-3.01)	4.41% (4.07-4.75)	973	349	5.37% (0.22-4.93)	1.57% (0.11-1.35)	620	726	3.04% (2.71-3.38)	4.14% (3.75-4.54)	549	763	3.25% (2.84-3.65)	3.62% (3.32-3.91)
Primary Education	4192	1905	37.55% (36.33-38.78)	18.06% (17.09-19.02)	5565	455	51.63% (50.40-52.86)	4.03% (3.53-4.53)	2525	3456	23.17% (22.07-24.27)	33.04% (31.88-34.20)	4532	1425	41.55% (40.29-42.81)	13.84% (13.00-14.72)
Secondary Education	2617	525	24.42% (23.33-25.52)	4.86% (4.33-5.40)	2980	102	28.31% (27.16-29.47)	0.94% (0.70-1.18)	1074	1953	10.27% (9.41-11.12)	18.75% (17.68-19.68)	2819	274	26.80% (25.66-27.95)	2.71% (2.25-3.17)
Higher	955	126	7.21% (0.29-6.65)	0.85% (0.11-0.64)	1042	21	8.00% (7.41-8.59)	0.15% (0.06-0.24)	338	623	2.69% (2.32-3.06)	4.90% (4.40-5.40)	1038	40	7.92% (7.34-8.51)	0.30% (0.16-0.44)
Wealth Poorest	1034	1161	8.22% (7.62-8.83)	7.28% (6.73-7.82)	1740	414	13.19% (12.47-13.90)	2.39% (2.07-2.70)	893	1256	6.00% (5.50-6.51)	9.78% (9.12-10.43)	1151	976	9.15% (8.50-9.80)	6.15% (5.66-6.64)
Poorer	1262	569	12.10% (11.36-12.85)	5.51% (4.95-6.08)	1666	141	16.40% (15.56-17.24)	1.29% (1.01-1.58)	769	1038	7.40% (6.77-8.03)	10.53% (9.80-11.26)	1365	434	13.32% (12.53-14.11)	4.35% (3.85-4.85)

Middle	1443	586	13.27% (12.53-14.01)	5.68% (5.13-6.23)	1896	111	18.00% (17.15-18.84)	0.99% (0.77-1.21)	773	1220	7.36% (6.76-7.96)	11.84% (11.11-12.58)	1580	395	14.81% (14.03-15.58)	3.97% (3.48-4.46)
Richer	1765	535	16.02% (15.15-16.89)	5.04% (4.48-5.60)	2161	116	20.09% (19.14-21.03)	1.08% (0.78-1.37)	886	1363	8.24% (7.54-8.93)	12.92% (12.10-13.75)	1882	375	17.62% (16.72-18.53)	3.46% (2.95-3.97)
Richest	2684	639	22.20% (21.46-22.94)	4.67% (4.13-5.21)	3097	145	25.65% (24.96-26.34)	0.94% (0.72-1.16)	1236	1881	10.17% (9.33-11.00)	15.76% (14.87-16.66)	2960	322	24.62% (23.89-25.36)	2.55% (2.09-3.97)
Marital Status	4269	2049	36.97% (35.70-38.23)	15.75% (14.89-16.61)	5687	544	49.00% (47.68-50.32)	3.79% (3.33-4.24)	2299	3820	19.18% (18.16-20.19)	33.59% (32.33-34.86)	4711	1450	41.39% (40.08-42.70)	10.96% (10.21-11.71)
Married																
Not Married	3919	1441	34.86% (33.60-36.10)	12.43% (11.60-13.27)	4873	383	44.31% (43.01-45.62)	2.90% (2.50-3.30)	2258	2938	19.99% (18.91-21.07)	27.24% (26.11-28.37)	4227	1052	38.13% (36.84-39.42)	9.52% (8.75-10.28)
Literacy	7428	2348	66.33% (65.18-67.47)	21.62% (50.59-22.66)	9089	531	83.43% (82.58-84.27)	4.64% (4.11-5.17)	3694	5730	33.81% (32.54-35.07)	53.83% (52.52-55.14)	8043	1558	73.19% (72.11-74.28)	14.94% (14.00-15.88)
Literate																
Not Literate	734	1140	5.47% (4.91-6.03)	6.58% (6.08-7.08)	1443	396	9.87% (9.20-10.55)	2.06% (1.78-2.34)	852	1012	5.36% (4.83-5.89)	7.01% (6.45-7.57)	871	944	6.30% (5.70-6.90)	5.57% (5.11-6.02)
Knowledge of HIV	5580	1361	54.86% (53.56-56.15)	12.63% (11.77-13.50)	6487	326	64.60% (63.34-65.85)	2.79% (2.34-3.23)	2537	4139	25.17% (23.94-26.41)	41.66% (40.28-43.05)	5960	888	59.17% (57.87-60.47)	8.40% (7.69-9.11)
Correct																
Incorrect	1948	1616	18.46% (17.43-19.50)	14.05% (13.15-14.95)	3083	447	29.24% (28.02-30.45)	3.38% (2.96-3.81)	1583	1931	13.90% (13.00-14.81)	19.26% (18.18-20.35)	2204	1287	21.28% (20.18-22.38)	11.14% (10.30-11.98)
Total	8188	3490	74.22	29.76	10560	927	95.76	7.49	4557	6758	45.06	63.23	8938	2502	81.98	21.93

Note. Unweighted N and weighted percentages are presented. All analyses accounted for complex sampling design.

Table 2: Bivariate and multivariable associations of exhibiting stigma and discrimination among persons living in Kenya

	Would buy vegetables from vendor you knew had AIDS Virus		Willing to care for family member with AIDS in the household		Would want HIV + status of family member to remain a secret		Should female teacher with AIDS but not sick be allowed to teach	
	Unadjusted	**Adjusted**	**Unadjusted**	**Adjusted**	**Unadjusted**	**Adjusted**	**Unadjusted**	**Adjusted**
Gender	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Male								
Female	0.56 (0.49-0.64)	0.65 (0.56-0.75)	0.55 (0.44-0.70)	0.66 (0.51-0.87)	2.11 (1.87-2.39)	2.07 (1.82-2.36)	0.84 (0.73-0.96)	1.07 (0.91-1.26)
Age (15-54)	1.003 (0.99-1.01)	1.01 (1.00-1.02)	1.02 (1.01-1.03)	1.03 (1.02-1.04)	0.98 (0.97-0.98)	0.98 (0.97-0.99)	1.01 (1.00-1.02)	1.02 (1.01-1.03)
Education	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
No Education								
Primary Education	3.48 (2.89-4.19)	0.25 (0.16-0.38)	3.73 (3.00-4.64)	0.26 (0.11-0.62)	0.96 (0.80-1.13)	1.13 (0.78-1.63)	3.34 (2.80-3.99)	0.16 (0.09-0.30)
Secondary Education	8.40 (6.81-10.37)	0.45 (0.32-0.62)	8.80 (6.41-12.08)	0.46 (0.22-0.97)	0.75 (0.61-0.91)	1.15 (0.91-1.46)	11.01 (8.66-14.00)	0.25 (0.15-0.42)
Higher	14.11 (10.26-19.41)	0.74 (0.54-1.03)	15.63 (8.10-30.19)	0.76 (0.35-1.65)	0.75 (0.59-0.95)	0.94 (0.75-1.20)	29.18 (17.87-47.64)	0.54 (0.32-0.91)
Wealth	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Poorest								
Poorer	1.94 (1.63-2.31)	1.29 (1.05-1.58)	2.30 (1.74-3.03)	1.46 (1.06-2.02)	1.15 (0.97-1.36)	1.23 (1.02-1.49)	2.06 (1.72-2.47)	1.36 (1.10-1.70)
Middle	2.07	1.30	3.29	1.94	1.01	1.11	2.51	1.50

	(1.75-2.44)	(1.06-1.59)	(2.48-4.36)	(1.40-2.69)	(0.86-1.19)	(0.92-1.34)	(2.09-3.01)	(1.21-1.87)
Richer	2.81 (2.36-3.36)	1.58 (1.27-1.95)	3.38 (2.45-4.67)	1.84 (1.25-2.71)	1.04 (0.88-1.23)	1.19 (0.98-1.44)	3.42 (2.80-4.19)	1.95 (1.54-2.48)
Richest	4.20 (3.51-5.03)	1.85 (1.47-2.32)	4.93 (3.71-6.53)	2.40 (1.66-3.48)	1.05 (0.88-1.25)	1.22 (0.99-1.51)	6.49 (5.18-8.14)	2.59 (1.96-3.43)
Marital Status	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Not Married								
Married	0.84 (0.75-0.94)	0.89 (0.77-1.03)	0.85 (0.70-1.03)	0.86 (0.68-1.08)	0.78 (0.70-0.87)	0.87 (0.76-0.99)	0.94 (0.83-1.07)	0.96 (0.82-1.14)
Literacy	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Not Literate								
Literate	3.69 (3.18-4.28)	1.44 (1.14-1.82)	3.75 (3.07-4.58)	1.63 (1.09-2.42)	0.82 (0.71-0.95)	0.74 (0.58-0.94)	4.33 (3.72-5.04)	1.91 (1.48-2.46)
Knowledge of HIV	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incorrect								
Correct	3.30 (2.92-3.75)	2.44 (2.14-2.79)	2.68 (2.16-3.33)	1.71 (1.36-2.16)	0.84 (0.74-0.94)	0.89 (0.77-1.02)	3.69 (3.22-4.23)	2.47 (2.12-2.88)

Note. Referent group is answering “No” to stated questions.

Table 3: Ordinal associations of exhibiting stigma and discrimination among persons living in Kenya

	Unadjusted OR (95% CI)				Adjusted OR (95% CI)			
	4	**3**	**2**	**1**	**4**	**3**	**2**	**1**
Gender	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Male								
Female	4.15 (2.13-8.07)	3.18 (2.47-4.09)	2.07 (1.73-2.48)	1.68 (1.47-1.92)	3.02 (1.53-5.96)	2.84 (2.13-3.79)	1.83 (1.50-2.22)	1.61 (1.40-1.86)
Age (15-54)	0.96 (0.94-0.99)	0.98 (0.97-0.99)	0.98 (0.97-0.99)	0.99 (0.98-0.99)	0.95 (0.92-0.96)	0.96 (0.95-0.97)	0.98 (0.96-0.99)	0.99 (0.98-0.99)
Education	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
No Education								
Primary Education	0.15 (0.09-0.25)	0.13 (0.10-0.18)	0.30 (0.22-0.40)	0.61 (0.45-0.83)	7.90 (1.58-39.59)	17.11 (5.24-55.93)	3.87 (2.11-7.08)	1.70 (1.05-2.75)
Secondary Education	0.01 (0.00-0.04)	0.03 (0.02-0.05)	0.11 (0.08-0.15)	0.38 (0.28-0.53)	5.36 (1.35-21.21)	6.00 (2.04-17.63)	2.65 (1.71-4.11)	1.39 (1.09-1.78)
Higher	0.01 (0.00-0.05)	0.01 (0.00-0.02)	0.06 (0.04-0.09)	0.37 (0.26-0.53)	1.20 (0.21-6.80)	2.26 (0.76-6.74)	1.46 (0.94-2.28)	0.96 (0.75-1.22)
Wealth	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Poorest								
Poorer	0.35 (0.18-0.67)	0.37 (0.28-0.50)	0.60 (0.47-0.78)	0.93 (0.75-1.16)	0.75 (0.37-1.54)	0.75 (0.53-1.05)	0.83 (0.62-1.10)	1.04 (0.82-1.26)
Middle	0.17 (0.08-0.36)	0.30 (0.22-0.40)	0.48 (0.38-0.61)	0.74 (0.60-0.91)	0.43 (0.19-1.01)	0.64 (0.45-0.89)	0.74 (0.56-0.98)	0.88 (0.70-1.12)
Richer	0.07 (0.03-0.17)	0.22 (0.16-0.30)	0.38 (0.30-0.50)	0.81 (0.66-1.00)	0.21 (0.08-0.54)	0.54 (0.38-0.78)	0.68 (0.49-0.88)	1.03 (0.81-1.31)
Richest	0.06 (0.03-0.13)	0.12 (0.08-0.17)	0.24 (0.19-0.31)	0.69 (0.55-0.86)	0.21 (0.09-0.50)	0.37 (0.22-0.62)	0.55 (0.40-0.75)	0.95 (0.73-1.22)
Marital Status	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Not Married								
Married	1.11 (0.68-1.81)	1.09 (0.88-1.33)	0.90 (0.77-1.05)	0.83 (0.73-0.94)	1.20 (0.69-2.08)	1.08 (0.84-1.39)	0.96 (0.78-1.17)	0.87 (0.74-1.02)

Literacy	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Not Literate								
Literate	0.09 (0.06-0.15)	0.12 (0.09-0.15)	0.24 (0.19-0.30)	0.50 (0.40-0.62)	0.24 (0.10-1.58)	0.40 (0.27-0.60)	0.49 (0.36-0.68)	0.62 (0.45-0.85)
Knowledge of HIV	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incorrect								
Correct	0.11 (0.06-0.21)	0.18 (0.14-0.23)	0.28 (0.23-0.33)	0.70 (0.61-0.82)	0.21 (0.11-0.40)	0.30 (0.24-0.39)	0.36 (0.30-0.44)	0.80 (0.68-0.93)

Note. Referent group is answering questions corresponding to no stigma for all four questions. Respondents were classified as exhibiting stigma if answered "No" to questions, "Would you buy vegetables from vendor you knew had AIDS virus?"; "Willing to care for family member with AIDS in the household?"; and "Should female teacher with AIDS but not sick be allowed to teach?" Respondents were classified as exhibiting stigma if answered "Yes" to question, "Would you want the HIV status of family member to be a secret?" Respondents were given 1 point for all questions answered exhibiting stigma, and outcome was classified as 0-4, with 4 exhibiting the highest level of stigma and 0 exhibiting no stigma.