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Community Perception of the HIV Vaccine in Western Kenya: Acceptability, Potential Behavior Changes, and Views on Compulsory Vaccination

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Community Perception of the HIV Vaccine in Western Kenya:
Acceptability, Potential Behavior Changes, and Views on Compulsory Vaccination

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School for International Training

Kenya: Urbanization, Health, and Human Rights

Fall 2017

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Abstract

Human Immunodeficiency Virus (HIV) suppresses the immune system by attacking T cells, leading to the development of acquired immunodeficiency syndrome (AIDS). HIV affects over 30 million people around the world and 1.6 million people in Kenya. On August 18, 1987, the FDA sanctioned the first human testing of a candidate vaccine for HIV. Currently, multiple HIV vaccines—projected to be on the market in five to ten years—are being tested for efficacy and safety. The goal of this study was to explore opinions related to the HIV vaccine so that there is a guide for future policy development in Western Kenya. This study included a survey and focus groups taken from a convenience sample at various locations within Kisumu in Kisumu County and Sidindi in Siaya County. The study found that most participants would get vaccinated if the HIV vaccine became available (87.7%), and the majority of participants support a compulsory vaccination campaign for children (81.18%).

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Background and Introduction

Human Immunodeficiency Virus (HIV) is a virus that suppresses the immune system by attacking the body's CD4 cells, also known as T cells, and if left untreated, HIV can lead to acquired immunodeficiency syndrome (AIDS), which signals that the body's immune system is severely suppressed (CDC, 2017). HIV is not curable, and once a person is infected, the individual has the HIV infection for life; HIV has three stages of infection (CDC, 2017). The first stage of infection is acute HIV infection, which occurs within two to four weeks after infection with individuals experiencing a flu-like illness, and the next stage of HIV infection is clinical latency in which a HIV positive person is asymptomatic (CDC, 2017). The last stage of infection is AIDS; AIDS signals that the individual is in the last stage of HIV infection, and the person is extremely vulnerable to opportunistic infections and cancers (CDC, 2017). Individuals can transmit HIV to others when infected by sharing bodily fluids through activities such as sexual contact, injection drug use, mother to child transmission, and blood transfusions (CDC, 2017).

HIV originated in chimpanzees in Central Africa as simian immunodeficiency virus (SIV), which scientists believe was transmitted to humans through infected blood from a hunted chimpanzee (CDC, 2017). The virus is believed to have then mutated, and it spread across Africa possibly as far back as the late 1800s (CDC, 2017). HIV was first detected in the United States in 1981, when young, previously healthy, gay men started to get rare and aggressive forms of diseases, such as Kaposi's Sarcoma and Pneumocystis carinii pneumonia, at higher rates than normal (HIV.gov, 2016). On June 5, 1981, the CDC's Morbidity and Mortality Weekly Report

stated the oddity of the aggressive diseases in previously healthy, young men (HIV.gov, 2016). The CDC used the term AIDS for the first time in 1982, and the virus became widely known and highly stigmatized shortly after that (HIV.gov, 2016). By 1985, at least one case of HIV was reported in each region of the world, making it a pandemic, and the Food and Drug Administration (FDA) approved the first test for HIV (HIV.gov, 2016). In 1986, the International Committee on the Taxonomy of Viruses stated that the virus would be called HIV (HIV.gov, 2016). In 1987, the FDA approved Zidovudine, the first antiretroviral drug for treatment of HIV and other nucleoside reverse transcriptase inhibitors (NRTIs) followed, but these medications were only able to suppress the virus for a short period of time (HIV.gov, 2016). In 1996, the New England Journal of Medicine advocated for the efficacy of combining two NRTIs in conjunction with protease inhibitors—a new kind of antiretroviral therapy—naming this combination therapy highly active antiretroviral therapy (HAART) (HIV.gov, 2016). Also in 1996, the FDA approved the first viral load test and the first non-nucleoside reverse transcriptase inhibitor (NNRTI)—nevirapine (HIV.gov, 2016). In 1997, the FDA approved Combivir, which made it easier for people to take their HIV medication by combining two medications into one tablet, and it was reported in the same year that more people were becoming resistant to protease inhibitors (HIV.gov, 2017). UNAIDS, global health groups, and five pharmaceutical companies announced a collaboration to reduce the price of HIV/AIDS medications in developing countries, and in 2002, the evidence of a rise in drug resistance came to light (HIV.gov, 2016). In December 2006, a University of Illinois Chicago study found that medical male circumcision reduced the risk of contracting HIV during sexual intercourse, paving the way for widespread advocacy for voluntary medical male circumcision throughout Kenya and other parts of Africa (HIV.gov, 2016). In 2009, the FDA approved the 100th antiretroviral drug for the treatment of HIV

(HIV.gov, 2016). In 2010, a study in South Africa showed a 39% decrease in likelihood of contracting HIV when anti-retroviral-based vaginal microbicides were used, and the NIH announced that pre-exposure prophylaxis (PrEP)—a daily oral dose of antiretroviral therapy—can reduce the risk of contracting HIV in HIV-negative people (HIV.gov). In 2011, a CDC study found that PrEP could reduce HIV transmission to HIV-negative partners in heterosexual relationships (HIV.gov, 2016). In 2012, the FDA approved Truvada for PrEP to reduce the risk of contracting HIV in HIV-negative adults (HIV.gov, 2016). There are multiple drug classes now currently on the market including nucleoside reverse transcriptase inhibitors, non-nucleoside reverse transcriptase inhibitors, protease inhibitors, fusion inhibitors, entry inhibitors, integrase inhibitors, pharmacokinetic enhancers, and combination HIV medicines (United States Department of Health and Human Services [USDHHS], 2017). HIV can be managed if the person seeks treatment with antiretroviral therapy, and if taken properly, this lessens their chances of transmitting the disease to another person, as well as decreases the probability of progressing to AIDS (CDC, 2017).

On August 18, 1987, the FDA sanctioned the first human testing of a candidate vaccine for HIV (HIV.gov, 2016). In 1996, the International AIDS Vaccine Initiative (IAVI) was formed to quicken the search for an effective HIV vaccine (HIV.gov, 2016). In 1997, President Bill Clinton called for the creation of an AIDS vaccine research center at the National Institutes of Health (NIH) with the center officially opening in 1999 (HIV.gov, 2016). Also in 1999, VaxGen began conducting human vaccine trials in Thailand for an HIV vaccine, but in 2003, the company announced the vaccine trial failed to reduce overall infection rates among those vaccinated (HIV.gov, 2016). In 2000, President Bill Clinton announced the launch of the Millennium Vaccine Initiative to promote the development and distribution of vaccines for HIV,

Tuberculosis, and Malaria (HIV.gov, 2016). On May 18, 2001, there was the first HIV Vaccine Awareness Day (HIV.gov, 2016). In 2004, a consortium of government and private sector companies was created to design and coordinate research to find an effective HIV vaccine (HIV.gov, 2016). In 2009, a vaccine trial run by the U.S. Military HIV Research Program and the Thai Ministry of Health found, with modest results, that a vaccine could prevent HIV infection (National Institutes of Health [NIH], 2016). In November 2016, the NIH and partners launched a phase 2b/3 HIV vaccine trial in 15 sites throughout South Africa, enrolling HIV-negative sexually active men and women between the ages of 18 to 35 years (National Institutes of Health [NIH], 2016). In addition, Johnson and Johnson—an American-based global pharmaceutical company—announced in September 2017 that the company will launch large-scale efficacy testing for their HIV vaccine in women between the ages of 18-35 in five African countries (McCarthy, 2017). Multiple HIV vaccines are now being tested in various countries with the hope that one of these vaccines will be effective and safe, and it is projected that a HIV vaccine could be on the market within the next 5 years (NIH, 2017) (McCarthy, 2017).

In this study, the researcher investigated community perception of the HIV vaccine by collecting surveys and conducting focus groups in the hope of collecting valuable insight into the opinions of people in Western Kenya in relation to the HIV vaccine, which will hopefully inform policy and further research. The goals of this study were to explore the acceptability of a HIV vaccine, assess possible behavior changes, and evaluate support for compulsory vaccination programs.

Statement of the Problem

There are an estimated 36.7 million people living with HIV around the world—1.8 million of those children (HIV.gov, 2016). The number of women living with HIV continues to increase globally with adolescents and young women being particularly vulnerable to infection (Avert, 2017). Acceptance of a HIV vaccine is necessary as drug resistance to many antiretroviral drugs continues to rise (HIV.gov, 2016). Prevention is the most cost-effective way to tackle HIV, and a HIV vaccine would be one of the most effective prevention strategies (Avert, 2017). There is currently very little data on the acceptability of the HIV vaccine in Kenya, as well as no documentation of possible behavior changes that could result if people were to get immunized. In addition, it would be beneficial to know how Kenyans feel about a compulsory vaccine, particularly a compulsory HIV vaccine, because it could inform policy.

Objectives

To investigate opinions of individuals in Western Kenya surrounding the HIV vaccine, specifically:

- To explore the acceptability of a HIV vaccine, such as the likelihood of parents having their children immunized and the efficacy [threshold they would consider acceptable](#).
- To assess possible behavior changes should a HIV vaccine be released onto the market.
- To evaluate the support of a compulsory HIV vaccine.

The Setting

Kenya

HIV was found in Kenya in 1984, and over 10% of the population was infected by the mid-1990s, which put huge demands on the healthcare system and caused mortality in the country to rise (Avert, 2017). There are about 1.6 million people living with HIV in Kenya, and the country has an adult HIV prevalence of 5.4% with a prevalence as high as 20% in some counties (Avert, 2017). Of HIV-infected adults, 64% are on antiretroviral treatment, while 65% of HIV-infected children are on antiretroviral treatment (Avert, 2017). There is still considerable stigma around HIV in Kenya, which can prevent people from accessing services and treatment (Avert, 2017). In 2015, it was estimated that up to 660,000 children were orphaned by AIDS (Avert, 2017). It is also noted that HIV disproportionately affects the Western part of the country (Avert, 2017). Vulnerable populations to HIV in Kenya include men who have sex with men, people who inject drugs, sex workers, and women (Avert, 2017). In Kenya, more women are living with HIV than men with young women accounting for 21% of all new infections with a prevalence significantly higher than males of the same age (Avert, 2017). It is argued the HIV vaccine will have the largest effect on young women because it can prevent them from ever getting infected, and it could have a very positive impact in high-incidence areas, such as Kisumu County and Siaya County—the location of this research study. The majority of the people in both Kisumu and Siaya are members of the Luo tribe. Both Kisumu and Siaya counties were part of the Nyanza province before devolution was implemented in the Constitution of Kenya 2010 (Kenya's devolution).

Kisumu

Kisumu—located on the shores of Lake Victoria—is the third largest city in Kenya. Because of the location on the shores of Lake Victoria, Kisumu is an area prone to tropical diseases, and it is also one of the areas in the country hardest hit by the HIV epidemic with 19.3% of the total population affected—the third highest prevalence in the country (Open Data Blog, 2014). The study was conducted in the area of Kondele within Kisumu, which is a slum outside the main central business district of Kisumu (personal communication with CHV, Ayub Saidi). This area has one of the highest numbers of commercial sex workers in the area where women sell their services to lorry truck drivers and local residents (personal communication with CHV, Ayub Saidi). This makes the area a hotbed for HIV to spread easily between sex workers, clients, and the clients' wives. Luckily, In Kisumu County, 104% of people who need antiretroviral drugs have access to them, which means that Kisumu has a supply in excess of what is required to treat their HIV positive population (HIV Situation in Kenya).

Siaya

Sidindi is a village located within Siaya county along the Kisumu Busia road—a major transportation route in Western Kenya. The people in this village primarily work in the market or farm their land, as well as keep livestock (personal communication with CHV, Monica). Siaya County has the second highest HIV prevalence in the country—23.7%, and 82% of those requiring antiretroviral treatment have access to these medications (HIV Situation in Kenya).



The map above shows the location of Sidindi with the red marker and Kisumu with the blue dot.

Literature Review

Sung-Jae Lee, Peter A. Newman, Naihua Duan, and William Cunningham explore attitudes related to vaccination and aim to develop a scale in which to examine HIV vaccine acceptability (2014). The researchers report the results with little bias, and the researchers make a compelling argument for the collection of attitudes now for the successful roll-out of HIV vaccinations in the future (Lee, S.-J., Newman, P. A., Duan, N., & Cunningham, W. E., 2014). The authors are all researchers at reputable universities, and this platform has been used for multiple studies to collect data (Lee et al., 2014). The results are supported by evidence, given the attitude scale was created from data collected as part of the large survey. The researchers identified four factors that affected vaccine acceptability, which were mistrust, HIV vaccine

social concerns, risk compensation, and altruistic vaccination (Lee et al., 2014). This work is investigating attitudes surrounding a HIV vaccine now before it is released, which provides insight into what apprehension and fear people have surrounding the vaccine.

In a study of pregnant mothers in Kenya, Carey Farquhar, Grace C. John-Stewart, Francis N. John, Marjory N. Kabura, and James N. Kiarie investigate the willingness of these mothers to participate in research studies, as well as their views on vaccine acceptability (2006). They found that almost all of the mothers would vaccinate their infant against HIV, but the number of mothers that said they would vaccinate against HIV if it required trips to the clinic every 3 months declined (Farquhar, C., John-Stewart G.C., John F.N., Kabura M.N., & Kiarie J.M., 2006). The authors are all experts in their fields, and there is limited bias in this study. The researchers' sample size was over 800 women, which provides strong evidence for their findings (Farquhar et al., 2006). This work shows that mothers want to have their children vaccinated, but a potential barrier to vaccination is the amount of doses a child would need (Farquhar et al., 2006). This is beneficial for public health professionals to know before they roll out potential vaccination campaigns for HIV in the future.

The Kenya Demographic and Health Surveillance Survey provides very useful data on HIV/AIDS in Kenya, as well as knowledge, attitudes, and behavior surrounding the virus (Ikamari, L., Wanyungu, J., Muttunga, J. Khasiani M., Awes, A.A., 2014). This data is collected at homes by trained interviewers, which makes this data very reliable (Ikamari et al., 2014). This is a program supported by KEMRI, which provides the survey with a strong ethical backing and credibility. This source provides baseline data on current rates of HIV/AIDS-related knowledge, behavior, and attitudes, which will provide useful data in the future if an HIV vaccine is released because researchers can see if risk behaviors change. Also, this data shows that knowledge and

awareness of HIV/AIDS is widespread in Kenya with most people having some knowledge of HIV, which is useful to know before interviewing people.

In Los Angeles, California, Peter A. Newman, Sung-Jae Lee, Ellen T. Rudy, Allison Diamant, Naihua Duan, Terry Nakazano, and William Cunningham investigate the characteristics and attitudes associated with support for compulsory HIV vaccination (2014). The authors have a large sample size, which gives ample evidence for support of their data (Newman et al., 2014). The researchers found that just under half of the people surveyed agreed with compulsory vaccination for HIV (Newman et al., 2014). The authors are all researchers at reputable universities in the United States, and the LA VOICES platform is used to collect data on multiple issues (Newman et al., 2014). This study contributes to the literature on opinions surrounding HIV vaccination because they have data from a large city in the United States on the acceptability and endorsement of a compulsory HIV vaccine.

Allison L. Friedman, Kelvin O. Oruko, Melissa A. Habel, Jessie Ford, Jennine Kinsey, Frank Odhiambo, Penelope A. Phillips-Howard, Susan A. Wang, Tabu Collins, Kayla F. Laserson, and Eileen F. Dunne investigate opinions surrounding HPV vaccination in Kenya prior to the initiation of vaccination programs for preteen girls; the study includes research into cervical cancer related knowledge, attitudes, beliefs, and acceptability (2014). The researchers conducted focus groups with caregivers, as well as key-informant interviews and found that the acceptability of the vaccination was high if there was support from trustworthy agencies and sensitization of communities, but there were concerns related to vaccine safety (Friedman et al., 2014). The authors are all researchers at reputable universities and organizations, and the study sites were located within the KEMRI demographic health surveillance system area (Friedman et al., 2014). This study provides valuable insight into issues surrounding preteen vaccines in

Western Kenya. Since this study was done before the program was implemented, it is a clear indication of need to collect vaccine acceptability data before a vaccine is available to the general public.

In a study on HPV vaccination in Kenya, Sylvia Becker-Dreps, Walter Agingu Otieno, Noel T. Brewer, Kawango Agot, and Jennifer S. Smith investigate the knowledge and interest surrounding HPV vaccination among women, and the researchers found that most mothers were willing to have their daughters vaccinated against HPV if it prevented cervical cancer (2010). The study also found that the women preferred if the vaccine was inexpensive and required few doses (Becker-Dreps, S., Otieno W.A., Brewer, N.T., Agot, K., Smith, J.S., 2010). The researchers are from a reputable university in the United States, as well as a reputable research organization in Kisumu, and the sample size of 147 individuals provides strong support for the data they found (Becker-Dreps et al., 2010). This study is a good model for a vaccine acceptability study in Kenya, and a good platform for evaluating HIV vaccine acceptability. Since this study was done before any HPV vaccination programs were implemented, it can help to inform policy surrounding the vaccine, which is beneficial.

While there have been studies conducted in Los Angeles about HIV vaccine acceptability and views surrounding compulsory vaccination, few studies have been done in Kenya or Sub-Saharan Africa surrounding HIV vaccination. Since Sub-Saharan Africa is the area in the world most affected by HIV, more studies should be done in this area to investigate opinions surrounding HIV vaccine acceptability and compulsory vaccination. Cultures differ in various parts of the world, so the culture surrounding vaccines in Africa could be quite different from that in the United States. Adolescent girls and young women are the most affected by HIV in Sub-Saharan Africa, so the HIV vaccine could have the largest effect on this age group if the

vaccine were to come to market. However, to ensure that girls are vaccinated before their first sexual encounter, parents will need to consent to their children being immunized. Therefore, the target population for this study was parents of young children, preteens, and adolescents because these age groups will need the vaccine before first sexual interaction. It will be crucial to have information regarding opinions on the HIV vaccination before it is released on the market because it will give health facilities and public health professionals time to prepare and implement [informed](#) vaccination campaigns that will work for the area.

Methodology

In this study, opinions relating to the HIV vaccine were explored including the acceptability of the HIV vaccine, possible behavior changes related to the vaccine, and the support of a compulsory vaccination program for the HIV vaccine. The data was collected in surveys that consisted of demographic information, vaccination history, opinions on vaccination, opinions on people with HIV, and opinions on the HIV vaccination, as well as in focus groups in which six questions were asked that expanded upon what was asked in the survey. The surveys took approximately 10 minutes to complete per participants, and the focus group took about 30 minutes to complete. The surveys were available in both English and Swahili, and the focus group questions were written in both English and Swahili with the [Community Health Volunteer \(CHV\)](#) for each area translating and clarifying with the local Luo language when necessary. The target population of this study was parents who were over the age of 18, and the age [of the respondent](#) as well as their [parental status](#) was confirmed by the community health volunteers in each of the areas.

In Kondele, the surveys were collected by traveling home-to-home, utilizing a convenience sample, as well as by stopping people on the street that were willing to take the survey. The participants were sought out and divided into one of two groups by income level—low-income and middle-income. The income level of the participant was determined by the structure of the home they resided within. Low-income homes were classified by mud-thatched homes, and middle-income was determined by structures made of cement block or brick. The participants for the focus groups were recruited through local community health volunteers in Kondele. In Sidindi, the surveys were collected by traveling home-to-home utilizing a convenience sample, as well as by distributing surveys to people in the market area of town. Income level was not noted for the participants in Sidindi. The participants for the focus group were recruited from the previous participants in the survey, and the participants were asked to attend the focus group the next day.

In Kondele, 101 surveys were completed, as well as two focus groups—one for low-income with 13 participants and one for middle-income with 10 participants. In Sidindi, 90 surveys were completed, as well as one focus group with 9 participants. It was decided to collect about 100 surveys in each area because of convenience and time limitations.

Limitations

The limitations of this research study consisted of language barriers between the researcher and participants, as well as the researcher and the community health volunteers. Because fluent Swahili and fluent Luo are not spoken by the researcher, some information was lost in translation in the focus group discussions. In addition, due to the election ruling by the Supreme Court in Kenya at the time of research, it was not safe to conduct research as usual, and

the community health volunteer had to conduct the middle-income focus group alone, which led to the researcher getting information on the focus group from a second-hand source.

Furthermore, another limitation is that the community of Sidindi may not accurately represent every other rural community in Western Kenya, but since this community was mostly Luo—the predominant ethnic group in Western Kenya, it can be used to predict the views of others in Western Kenya to some extent.

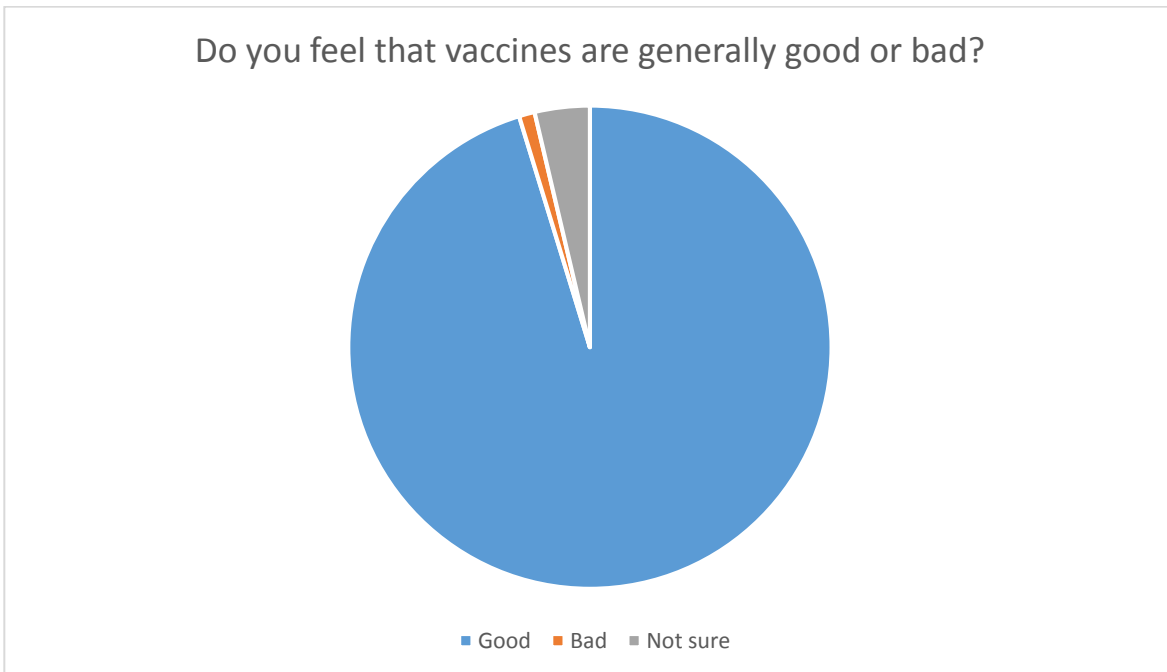
Results

Demographics of Study Participants (n=193)		
Variable	Options	Number (%)
<i>Highest Attained Level of Education</i>	No schooling	1 (0.52%)
	Primary School	63 (32.98%)
	Secondary School	78 (40.84%)
	College	36 (18.85%)
	Degree	13 (6.81%)
<i>Religion</i>	Anglican	72 (37.5%)
	Catholicism	53 (27.6%)
	Islam	13 (6.77%)
	Seventh-Day Adventist	17 (8.85%)
	Pentecostal	18 (9.42%)
	Other	19 (9.9%)
<i>Age</i>	Below 25	33 (17.1%)
	26-30	39 (20.21%)
	31-35	39 (20.21%)
	36-40	25 (12.95%)
	41-45	16 (8.29%)
	46-50	21 (10.88%)
	Over 50	20 (10.36%)
<i>Residence</i>	Kisumu County	98 (51.31%)
	Siaya County	93 (48.69%)

<i>Do they own property?</i>	Yes	89 (49.72%)
	No	90 (50.28%)
<i>Gender</i>	Male	65 (33.85%)
	Female	127 (66.15%)
<i>Have they received immunizations in the past?</i>	Yes	171 (89.53%)
	No	20 (10.47%)

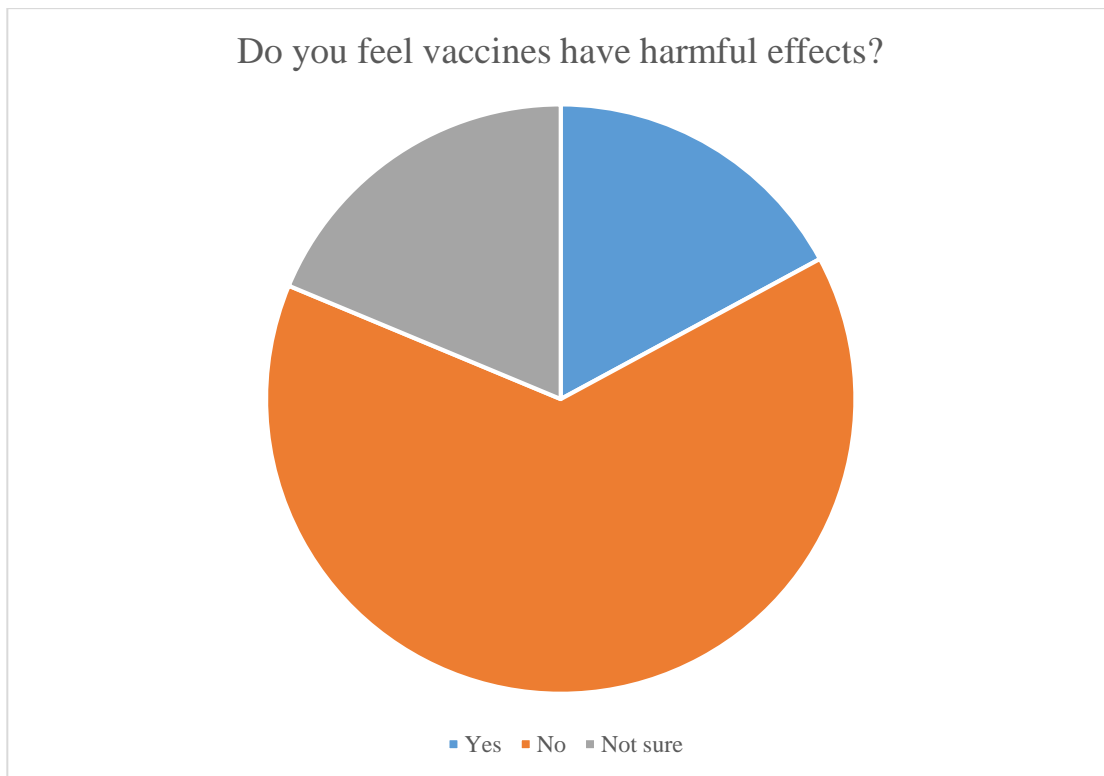
Do you feel that vaccines are generally good or bad?

Answer	Frequency of Answer (%)
<u>Good</u>	181 (92.26%)
<u>Bad</u>	2 (1.05%)
Not sure	7 (3.68%)
Total	190



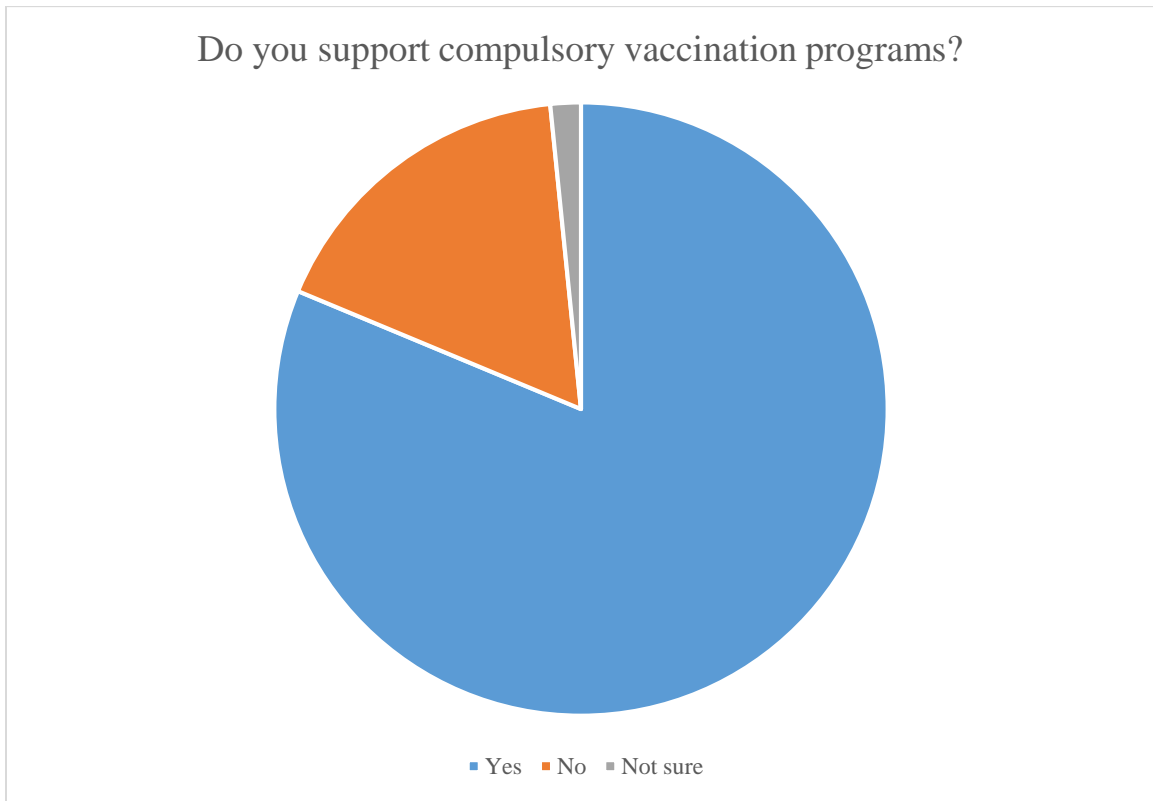
Do you feel that vaccines have harmful effects?

Answer	Frequency of Answer (%)
Yes	32 (17.11%)
No	120 (64.17%)
Not sure	35 (18.72%)
Total	187



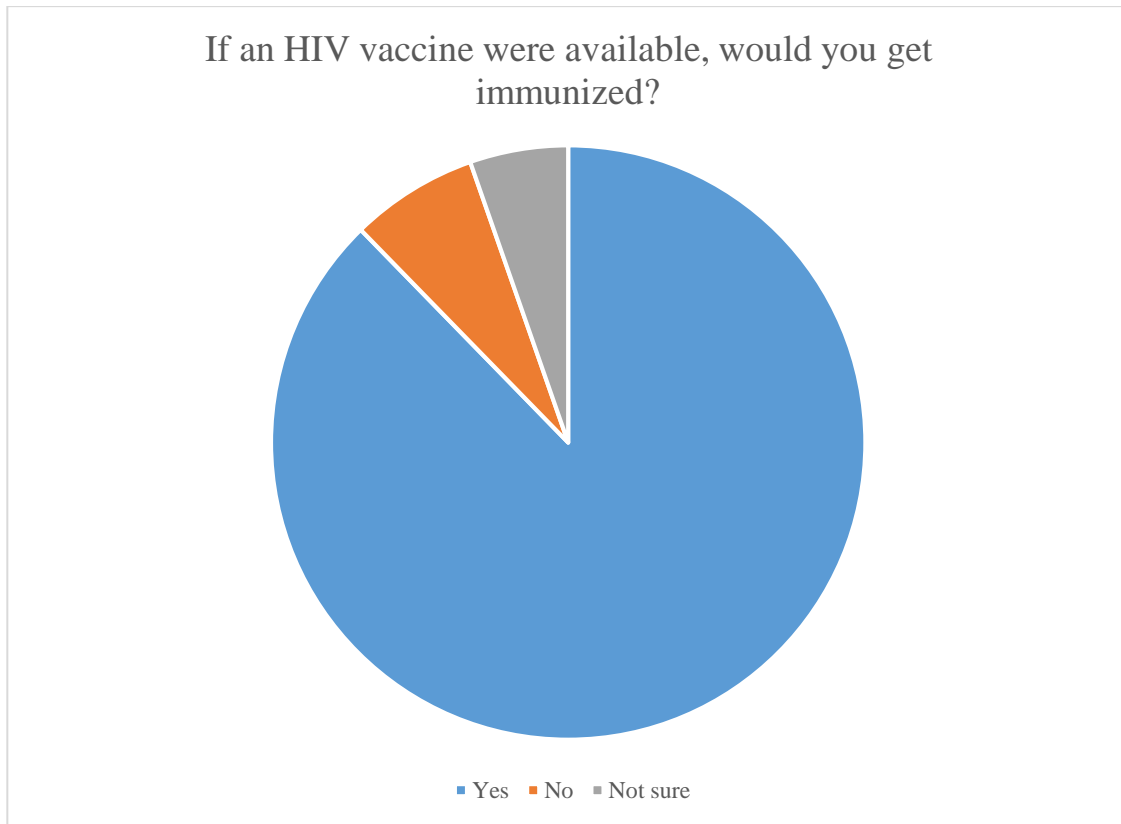
Do you support compulsory vaccination programs?

Answer	Frequency of Answer (%)
Yes	152 (81.28%)
No	32 (17.11%)
Not sure	3 (1.6%)
Total	187



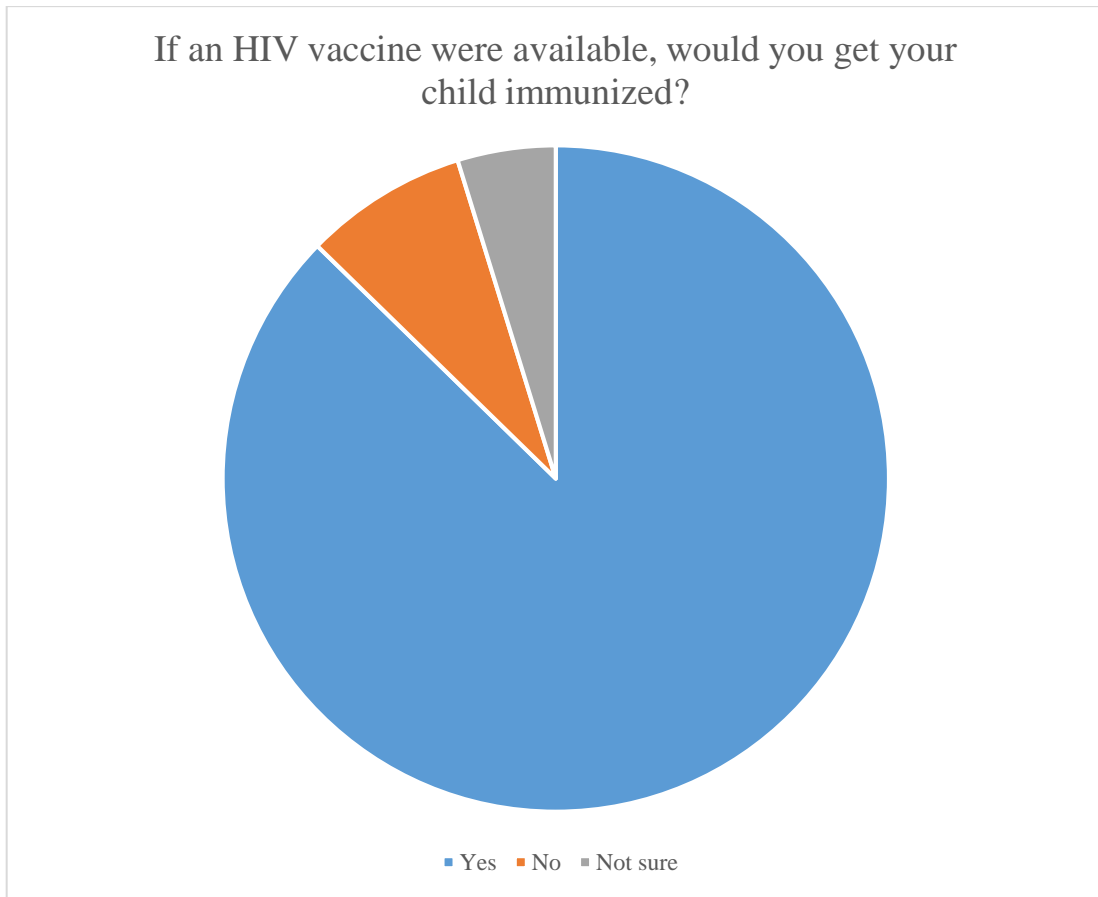
If a HIV vaccine were available, would you get immunized?

Answer	Frequency of Answer (%)
Yes	164 (87.7%)
No	13 (6.95%)
Not sure	10 (5.35%)
Total	187



If a HIV vaccine were available, would you get your child immunized?

Answer	Frequency of Answer (%)
Yes	165 (87.3)
No	15 (7.94%)
Not sure	9 (4.76%)
Total	189



If a HIV vaccine were available, would you get immunized if it required one dose?

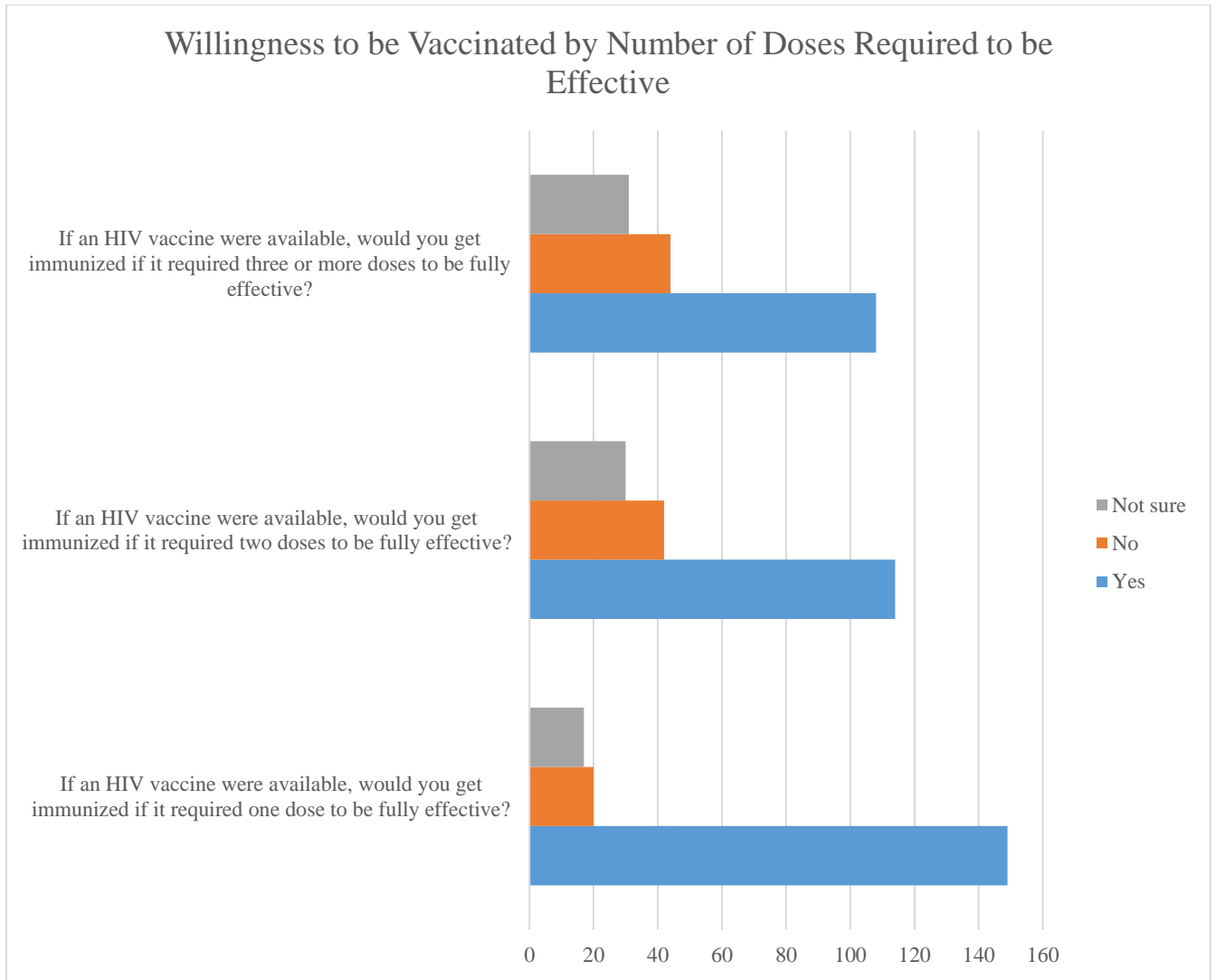
Answer	Frequency of Answer (%)
Yes	149 (80.1%)
No	20 (10.75%)
Not sure	17 (9.14%)
Total	186

If a HIV vaccine were available, would you get immunized if it required two doses to be fully effective?

Answer	Frequency of Answer (%)
Yes	114 (61.29%)
No	42 (22.58%)
Not sure	30 (16.13%)
Total	186

If an HIV vaccine were available, would you get immunized if it required three or more doses to be fully effective?

Answer	Frequency of Answer (%)
Yes	108 (59.01%)
No	44 (24.04%)
Not sure	31 (16.94%)
Total	183

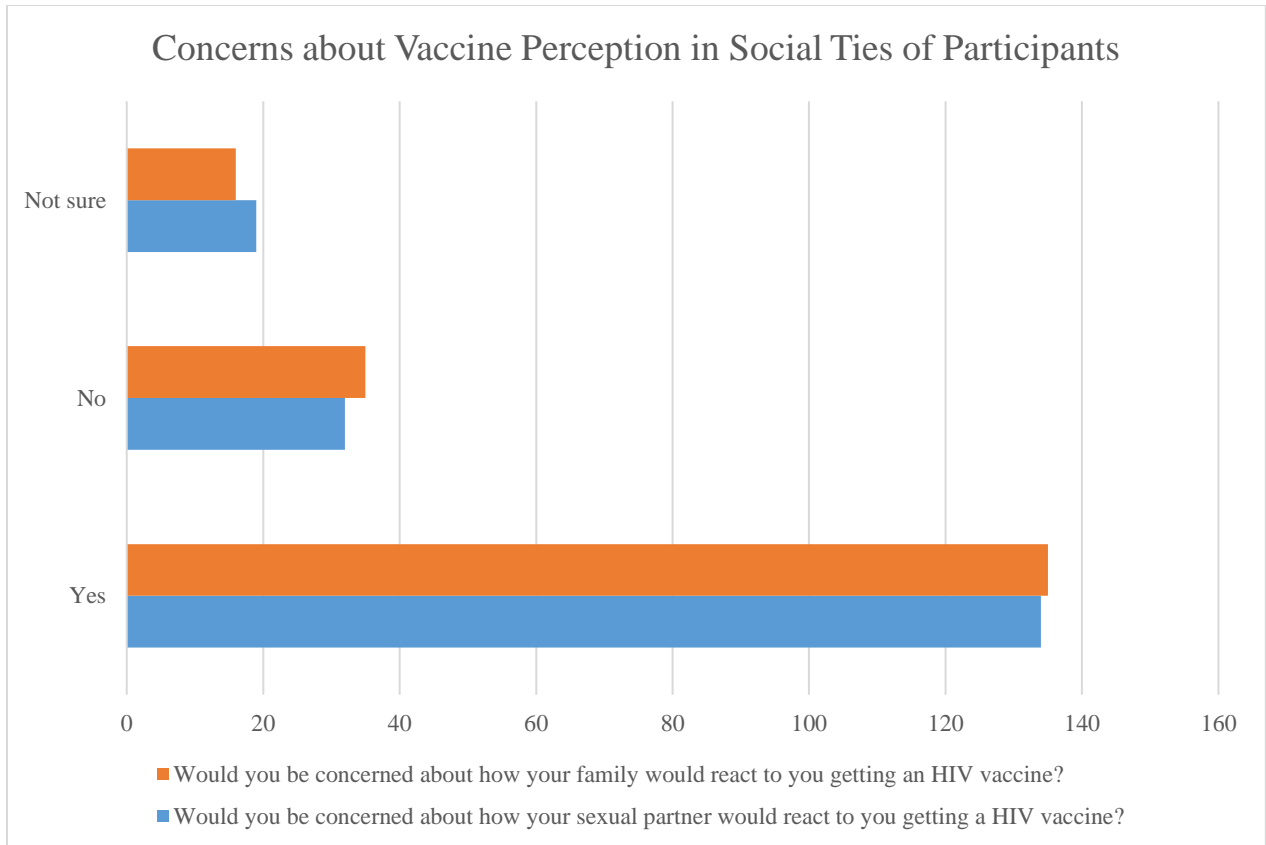


Would you be concerned about how your sexual partner would react to you getting a HIV vaccine?

Answer	Frequency of Answer (%)
Yes	134 (72.43%)
No	32 (17.3%)
Not sure	19 (10.27%)
Total	185

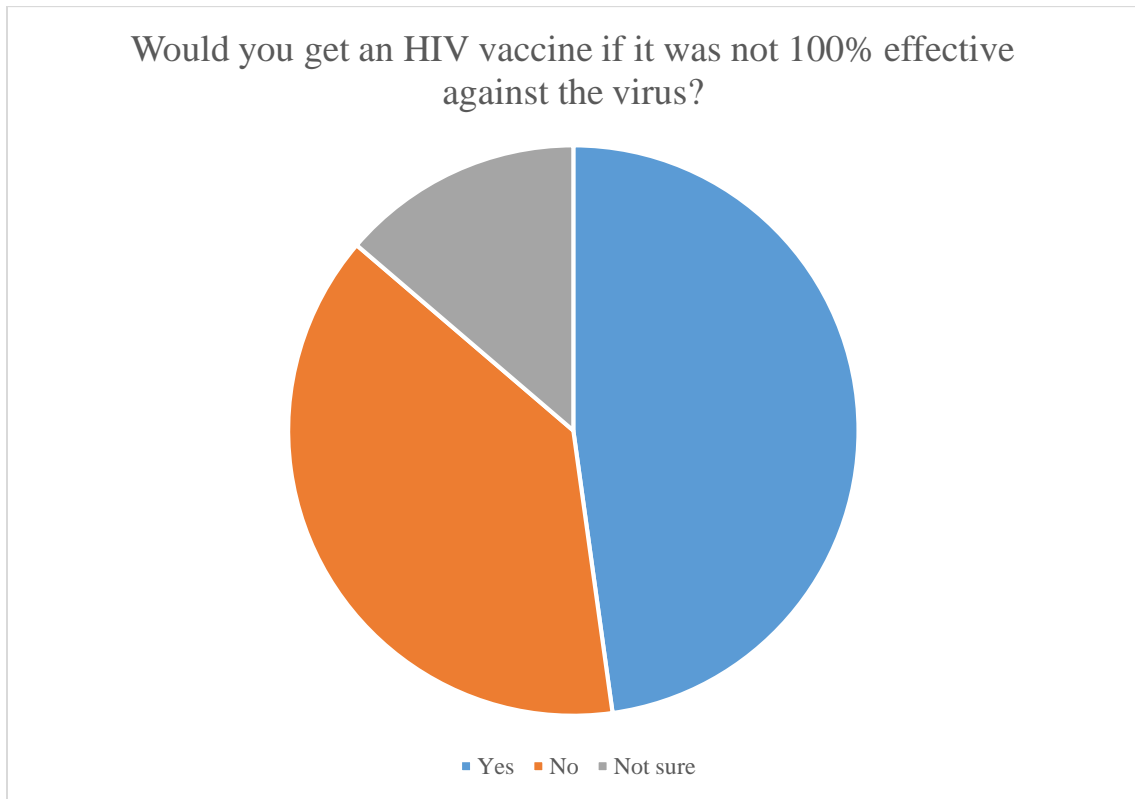
Would you be concerned about how your family would react to you getting a HIV vaccine?

Answer	Frequency of Answer (%)
Yes	135 (72.58%)
No	35 (18.82%)
Not sure	16 (8.6%)
Total	186



Would you get an HIV vaccine if it was not 100% effective against the virus?

Answer	Frequency of Answer (%)
Yes	87 (42.8%)
No	70 (38.46%)
Not sure	25 (13.7%)
Total	182



Would you support a compulsory HIV vaccine for all children?

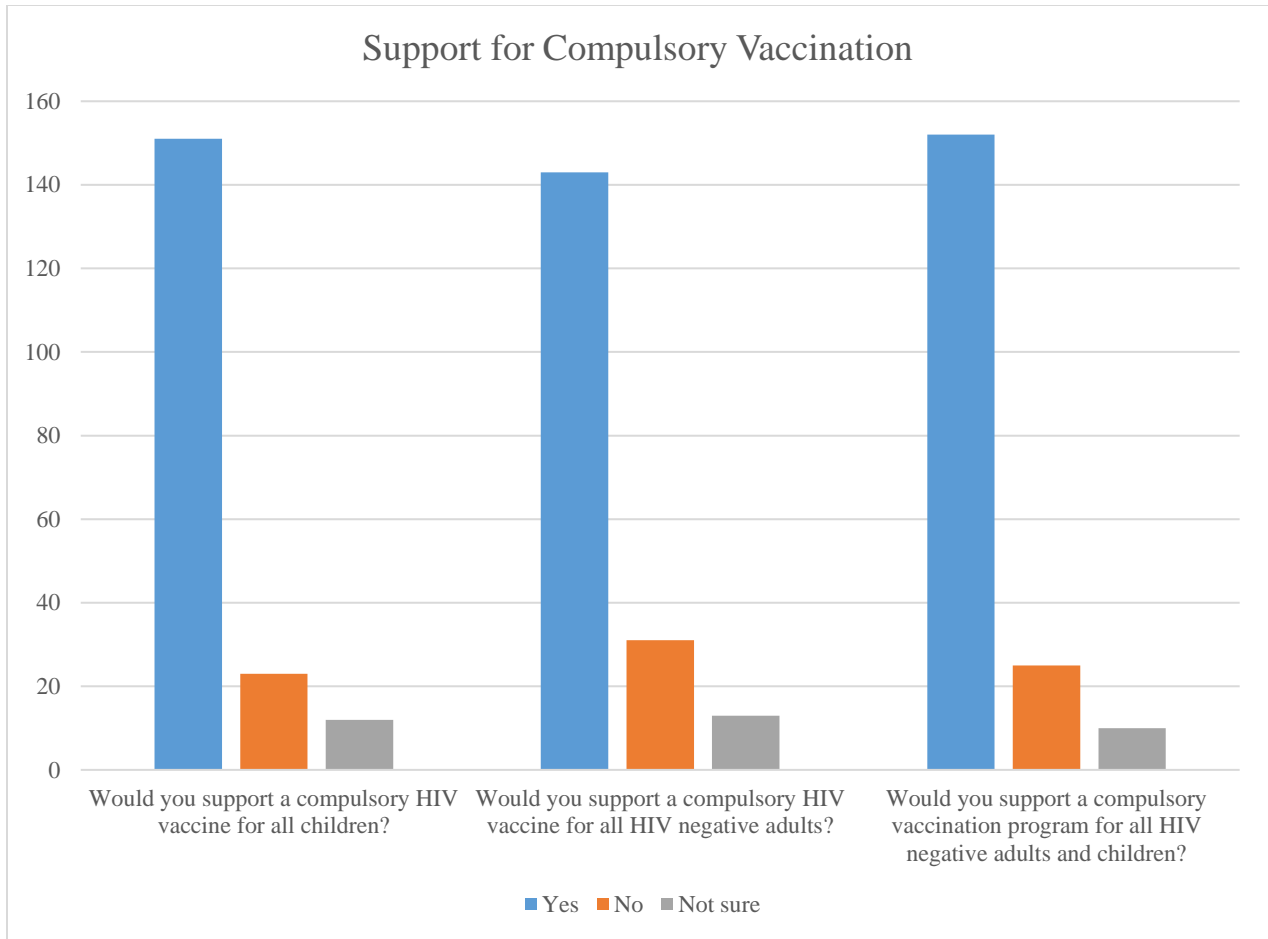
Answer	Frequency of Answer (%)
Yes	151 (81.18%)
No	23 (12.37%)
Not sure	12 (6.45%)
Total	186

Would you support a compulsory HIV vaccine for all HIV negative adults?

Answer	Frequency of Answer (%)
Yes	143 (76.47%)
No	31 (16.58%)
Not sure	13 (6.95%)
Total	187

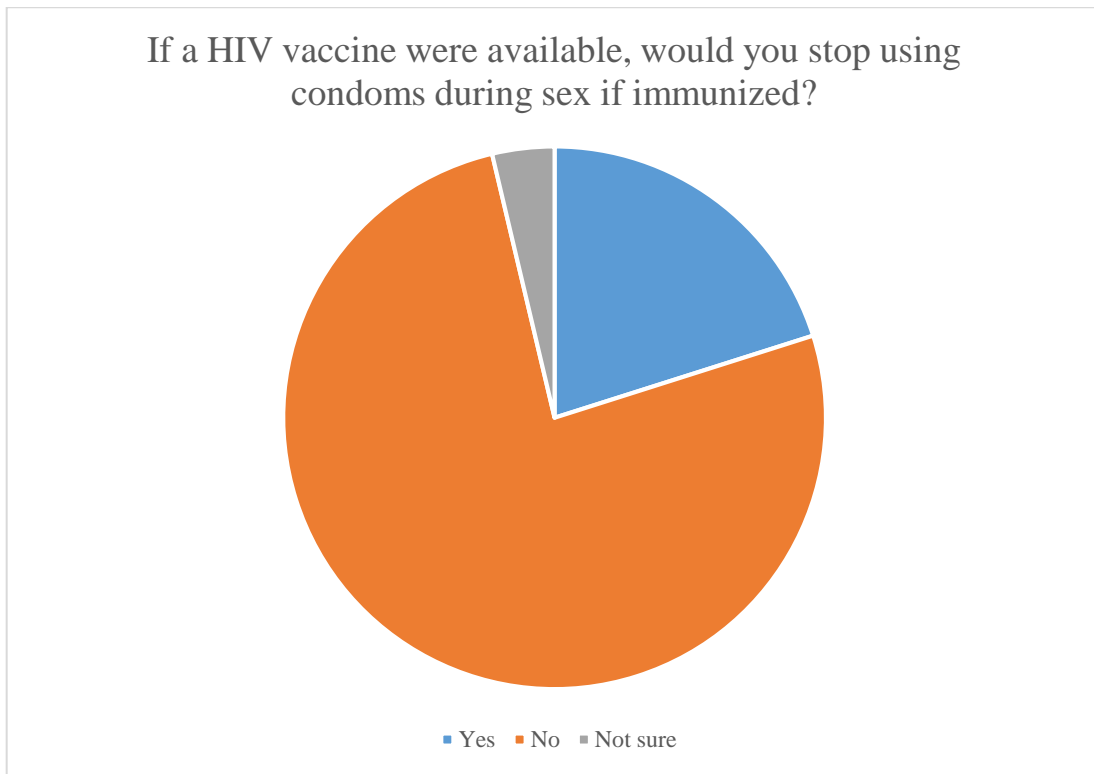
Would you support a compulsory HIV vaccine for all HIV negative adults and children?

Answer	Frequency of Answer (%)
Yes	152 (81.28%)
No	25 (13.37%)
Not sure	10 (5.35%)
Total	187



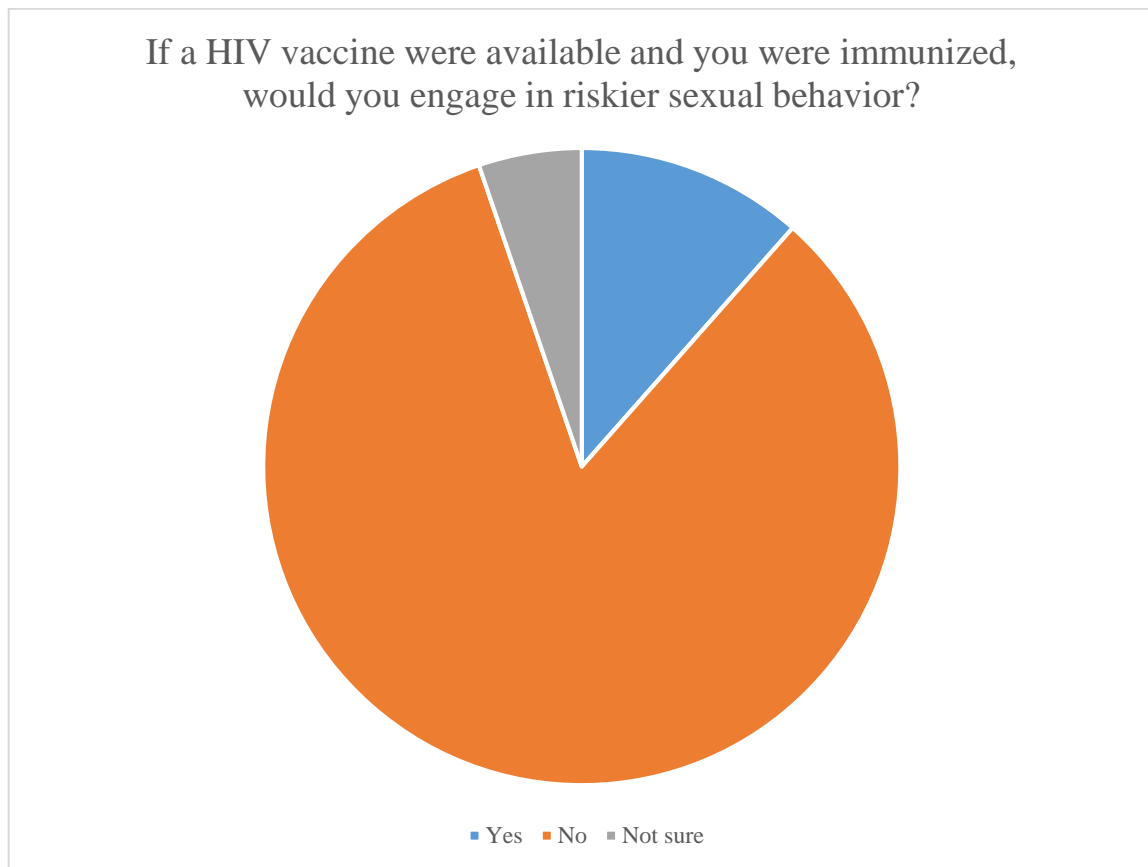
If the HIV vaccine was available, would you stop using condoms during sex?

Answer	Frequency of Answer (%)
Yes	38 (20.11%)
No	144 (76.19%)
Not sure	7 (3.7%)
Total	189



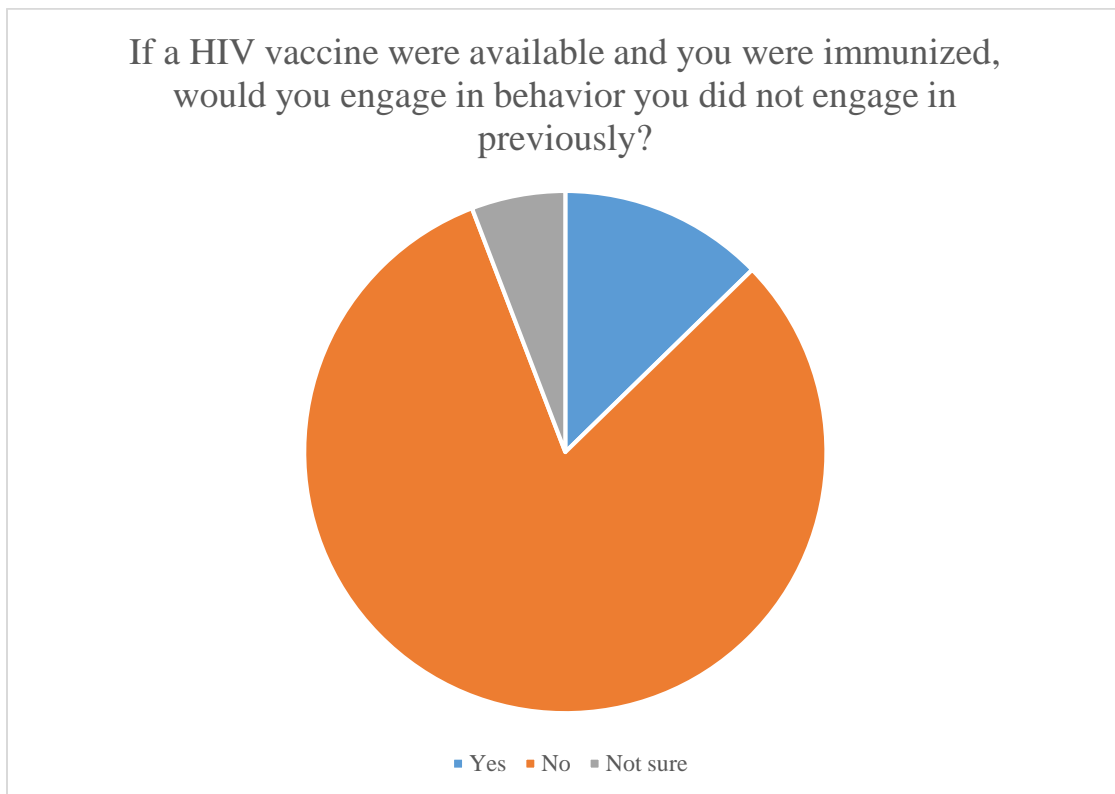
If a HIV vaccine was available and you were immunized, would you engage in riskier sexual behavior?

Answer	Frequency of Answer (%)
Yes	22 (11.52%)
No	159 (83.25%)
Not sure	10 (5.24%)
Total	191



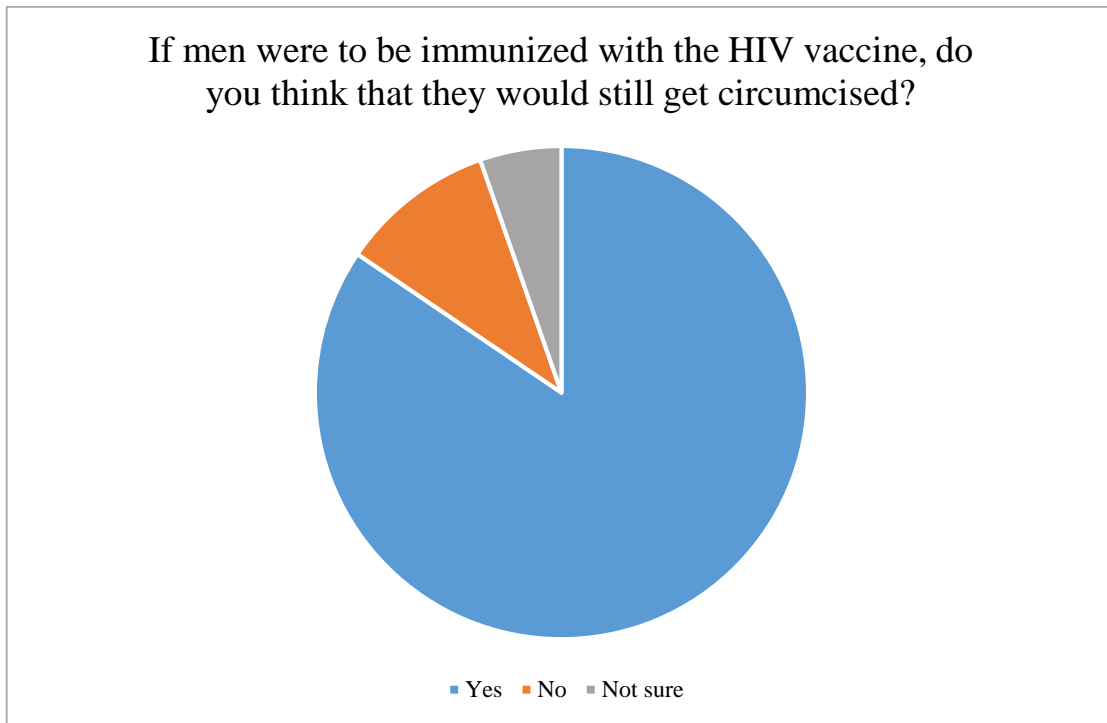
If a HIV vaccine was available and you were immunized, would you engage in behavior you did not engage in previously?

Answer	Frequency of Answer (%)
Yes	24 (12.7%)
No	154 (81.48%)
Not sure	11 (5.82%)
Total	189



If men were to be immunized with a HIV vaccine, do you think that they would still get circumcised?

Answer	Frequency of Answer (%)
Yes	158 (84.49%)
No	19 (10.16%)
Not sure	10 (5.35%)
Total	187



Discussion and Analysis

Introduction

The objective of the research study was to investigate the opinions of individuals in Western Kenya surrounding the HIV vaccine, specifically the acceptability of the vaccine, potential behavior changes that could result from an individual being vaccinated, and support for a compulsory HIV vaccination campaign.

Acceptability of the HIV Vaccine

One of the key questions asked during this study evaluated if participants would be willing to get vaccinated with the HIV vaccine when it became available to the general public. In the total responses, 87.7% of participants answered that they would get immunized themselves if the vaccine were to come to market. Comments from the focus groups noted that all ages are affected by HIV and that most homes are affected in some way. A key point that one participant noted was that it is more expensive to treat HIV than it is to prevent it, so a vaccine could help alleviate the burden on the health care system. HIV has had a drastic impact on the healthcare systems of the countries most ravaged by the epidemic, and a vaccination could create a large-scale preventative measure that is quick, easy, and efficient. Currently prevention is largely focused on behavioral changes and pre-exposure prophylaxis, but these prevention efforts leave a lot of room for error. If the vaccine would be given properly and people showed up to all the required doses, vaccination could be a prevention effort that finally slows the epidemic. While this study had a smaller sample size than comparable research studies, the results differ from the other literature on HIV vaccine acceptability. As a participant in the focus group stated, HIV is a major problem in Kenya and no

family is left untouched. Thus, this could lead to more support for vaccination, as well as account for the high number of individuals that indicated they would be willing to be vaccinated themselves. The support for vaccination in Western Kenya should be noted to inform policy when the vaccine is available to the general public so that individuals can have access to the vaccine as quickly as possible. It is estimated that about 7,500 young women are infected with HIV every week around the world, so the vaccine could have a major impact in incidence as soon as widespread vaccination efforts are implemented (AVERT). People in Western Kenya want help, and they desire something that will finally have a drastic impact on HIV. As a participant in the focus group in Sidindi said: “We don’t want to swallow drugs everyday. We’re tired of people dying. We need help.” A large-scale vaccination campaign implemented by trained community health volunteers that go home-to-home could be an efficient way to ensure all people that want the vaccine have access to it. This research study has shown that most people surveyed were willing to be vaccinated, and [preparation for](#) large-scale vaccination campaigns should start to take shape now so that the most people possible have access to the vaccine as soon as possible after it is released.

Children arguably need the vaccine most because this reduces their chances of contracting HIV when they get older. However, since parents make health care decisions for their children, parents are the ones that need to decide to have their children vaccinated with the HIV vaccine. Women and girls ages 10-24 are most likely to contract HIV, and the HIV vaccine will only be effective if given before the person contracts HIV. Thus, children need to get the vaccine before first sexual contact to have the optimal amount of prevention opportunities. Participants at the focus groups in Kondele noted that the age of first sexual intercourse is usually around twelve for girls, as young as nine, and for boys around the age of ten. This means that children would have

about eight years of sexual encounters before they were able to make their own decisions about vaccination, so parents need to consent to have their children vaccinated at a young age before first sexual encounter. In the study, it was found that 87.3% of parents would be willing to have their children vaccinated with the HIV vaccine, and participants state that they would be willing to have their kids vaccinated because of early age of first sexual intercourse and the fact that HIV can be transmitted through blood contact. However, some parents still maintained that children did not need it because they did not have sex. There are issues of rape and defilement in the community, so parents would be willing to have their children protected from HIV to some extent at a young age. Other parents had issues with the efficacy of the virus. One parent stated that they would vaccinate their child if the vaccine was 100% effective against the virus, while another parents stated they would vaccinate their child if the vaccine was more than 80% effective. These results go along with the results found by Farquhar, John-Stewart, John, Kabura, and Kiarie in a study of over 800 pregnant mothers in Kenya (Farquhar et al., 2006). The authors found that almost all of the mothers would vaccinate their children against HIV (Farquhar et al., 2006). It seems that parents who have seen the impact of HIV in their communities are willing to have their children vaccinated with a safe and effective vaccine. While parents would agree to have their children immunized, there might be issues in the future with parents not being willing to vaccinate their children against a disease that is sexually transmitted. In the future, parents will need to make the decision to vaccinate their children against HIV, and the health care system needs to enable them with all the tools to make that decision in an educated manner.

The HIV vaccine is currently in human clinical trials, and the researchers are evaluating effectiveness of the vaccine and [the appropriate dosage regimen](#) (NIH, 2016). The HIV vaccine could require any number of doses to be effective, and in this study, the researcher attempted to

evaluate the willingness of people to get vaccinated depending on number of doses required to be fully effective. It was found that 80.1% of individuals would get vaccinated if it required one dose to be fully effective, but the amount of people that would get vaccinated if it required two doses was 61.29%. Individuals that would get vaccinated if it required three or more doses were 59.01% of study participants. The amount of people that would get the vaccine if it required two doses drops significantly from the amount of people who would get vaccinated if it required one dose. This could be due to a number of reasons, such as difficulty of getting to a clinic and the inability to track when they will need the vaccine. In a study of pregnant mothers in Kenya, Carey Farquhar, Grace C. John-Stewart, Francis N. John, Marjory N. Kabura, and James N. Kiarie investigated the willingness of mothers to have their infants vaccinated with the HIV vaccine, but the amount of mothers that would have their children vaccinated if it required trips to the health clinic every three months decreased significantly (2006). The results of this study indicate the same pattern that was found in the research study. Vaccinations that require more than one dose can become an inconvenience to parents who must take their children to the health clinic for all of their healthcare visits. Also, keeping track of the spacing and time of vaccinations can be difficult to manage. The healthcare system will need to create a creative plan to get people to come for multiple doses if that is what the vaccine requires. This could involve calling the individuals or parents to remind them of appointments to get vaccinated. The vaccination program could also be implemented by community health volunteers that vaccinate all people and children that are willing, and then return to those houses when the subsequent doses are required. This means that one person has to keep the schedule for the vaccines rather than each individual person. Also, a crucial component to a vaccine regiment that has multiple doses is that the healthcare clinic must have the required doses for everyone that needs them at the time they come in for the vaccination. Shortages of vaccines

could jeopardize the vaccine programs as people become frustrated and do not return to the clinic for the next doses. Policy implementation and a well thought out vaccination campaign will be necessary for a successful roll-out of a vaccine that requires multiple doses.

Perception of family members and sexual partners can have an impact on decision making. In this research study, two questions were asked that attempted to evaluate how the participants thought their family and their sexual partners would react to them getting an HIV vaccine. In the study, 72.43% of participants surveyed indicated that they were concerned about [how](#) their sexual partner would react to them getting a HIV vaccine, while 72.58% were concerned about how their family would react to them getting a HIV vaccine. In the L.A. VOICES survey, Sung-Jae Lee, Peter A. Newman, Naihua Duan, and William Cunningham were investigating HIV acceptability in Los Angeles, California, and they found that among social concerns related to getting the vaccine were concerns about how their families and sexual partners might react to them getting the HIV vaccine (2014). Almost all Kenyans have seen the impact of the HIV epidemic in some way, so with education programs in local communities, the potential stigma around the HIV vaccine could be mitigated.

Since the HIV vaccine is currently in testing, there is no way at this time to know how effective the HIV vaccine will be against the virus, but the HIV vaccine study in Thailand showed modest protection against the virus (NIH, 2016). It was found in the study in Western Kenya that only 42.8% of study participants would get the vaccine if it was not 100% effective against the virus, which leads to questions about vaccine acceptability if it is only modestly effective. While even a modestly effective vaccine could lead to a reduction in HIV incidence, communities might have issues accepting a vaccine with low efficacy against HIV (NIH, 2016). Sung-Jae Lee, Peter A. Newman, Naihua Duan, and William Cunningham advocate that real-world vaccine efficacy

cannot be ignored as a potential contributor to HIV vaccine acceptability (2014). A vaccine is seen as a sense of security against a certain disease, but if a vaccine is not close to 100% effective, it can undermine people's trust in the vaccine. However, in Kenya, if the vaccine is modestly effective, then people who are vaccinated need to be educated about the fact that the vaccine is modestly effective so that people do not engage in riskier sexual behavior and stop using condoms because of a false sense of security.

Potential Behavior Changes

The fear among many experts and local community members is that a HIV vaccine could actually lead to an increase in other sexually transmitted diseases because of the sense of security against HIV that the vaccine will provide (Painter et al., 2017). In the study, it was found that 76.19% answered they would not stop using condoms during sex if immunized. However, 20.11% said they would stop using condoms during sex, which could still lead to an increase in other sexually transmitted diseases among this group. In addition, 83.25% said they would not engage in riskier sexual behavior as a result of being vaccinated, while 84.49% said they would not engage in behavior they did not engage in previously if vaccinated. Even though most people answered that they would not change their sexual behavior as a result of being vaccinated, there is still a large number of people that answered they would. Julia E. Painter, Ralph J. DiClemente, Lauren Jimenez, Theron Stuart, Jessica M. Sales, and Mark J. Mulligan attempted to investigate potential behavior changes in conjunction with a HIV vaccine trial in Atlanta, and they found that one of the motivators for participating in the study was to feel safer having unprotected sex (2017). However, this study was done in a community in Atlanta, and it might not be an accurate comparison for the area in which this study was conducted. Behavior might change as a result of

a HIV vaccine, but people need a way to stop the spread of HIV. It is a trade-off because protection from HIV may lead people to stop using condoms that they only used because of HIV. However, the benefit of the HIV vaccine and the potential burden it will alleviate on the population and the healthcare system in the future is too great to give up for the possibility that other sexually transmitted disease may increase. Education campaigns need to be emphasized that explain that the HIV vaccine is another preventative measure, but it is not to be used instead of safe sexual behavior. Potential behavior changes are impossible to truly know unless studies are implemented after the HIV vaccine is available to the general public, and studies should be done to evaluate these potential behavior changes at that time.

Views on Compulsory Vaccination

Compulsory vaccination refers to mandatory vaccinations that are usually required by the government of the country. This study attempted to evaluate support for compulsory vaccination programs, as well as support for compulsory vaccination programs for the HIV vaccine. It was found that 81.28% of people supported compulsory vaccination programs. For the HIV vaccine, 81.8% of of study participants indicated support for a compulsory vaccination program for all children, and 76.47% of participants supported a compulsory vaccine for HIV negative adults. However, 81.28% of those surveyed supported a compulsory vaccine for all HIV negative adults and children. Participants in the focus groups noted that the vaccine should be compulsory to stop the spread of HIV, but others disagreed with the compulsory vaccination stating that researchers do not know how the vaccine will react with the human body and that HIV counseling services are not compulsory. Many stated that vaccine should be just for those who are HIV positive, which indicates a lack of [awareness and knowledge about how vaccines work](#). One parent stated [d](#) that the

vaccine should be compulsory for those who are HIV negative to: prevent transmission, save resources which can be used for individuals with HIV for treatment, and promote life. There was a difference in support for compulsory vaccination programs between rural and urban areas with 71.6% of people in rural areas supporting compulsory vaccination programs, while 89% of those in urban areas supported compulsory vaccination programs. In Los Angeles, California, Peter A. Newman, Sung-Jae Lee, Ellen T. Rudy, Allison Diamant, Naihua Duan, Terry Nakazano, and William Cunningham investigated support for compulsory vaccination, and they found that just under half of those surveyed supported compulsory HIV vaccination programs (2014, pp. 5). This is in contrast to this study in which overall 81.28% of people supported compulsory vaccination, and 81.28% supported compulsory vaccination for all HIV negative adults and children. This area of Kenya has a high HIV rate, which may contribute to the desire for more people to want a widespread preventative measure, but further studies with larger sample sizes and a larger study area need to be done. While there was support for compulsory vaccination of all HIV negative adults and children, this leads to issues with testing because people may be unwilling to be tested for HIV and should not be forced to be tested if not desired. This could most likely be remediated by implementing a compulsory vaccination for all children and having an optional vaccine for adults. Larger studies should be implemented that could inform policy and potentially allow for a HIV vaccine campaign to be developed before the vaccine becomes available to the general public.

Ramifications

This study can be used as a basis for a large study in which vaccine acceptability and support for compulsory vaccination is further evaluated, as well as provide a [basis](#) for further study into potential behavior changes that may be the result of being vaccinated. In addition, policy needs

to be made now relating to the HIV vaccine because the longer it takes for policy once the vaccine is released, the more people there are [where](#) HIV [infection](#) could have been prevented. Thinking ahead is a crucial step for HIV vaccine policy, and the researcher hopes that this study can start the discussion. People in the communities that were studied seem to be really excited about the vaccine, and they were eager to ask questions about it. Discussion about the HIV vaccine and education programs should be [start](#)ed in these communities now.

Conclusion

Over 30 million people are infected with HIV in the world, and currently there are no vaccines on the market. Multiple HIV vaccines are currently in clinical trials, and there are hopes that the HIV vaccine could be available to the general public within five to ten years. In Kenya, there [is](#) little research on how communities feel about the vaccine, and [in](#) this study, community perception of the HIV vaccine was investigated, particularly acceptability, potential behavior changes, and support for compulsory vaccination programs. It was found that that majority of participants would be willing to be vaccinated with the HIV vaccine and vaccinate their children. In addition, participants largely answered that they would not change their current sexual behavior as a result of the vaccine, and the majority of participants supported compulsory vaccination programs for the HIV vaccine. There was some basic vaccine information lacking in the study participants, but most seemed very willing to accept the vaccine to finally have a viable solution for a reduction in HIV incidence.

Recommendations

Further Study

This study could be expanded by conducting the same study with a larger sample size taken from a wider geographic area that would give more reliable results. This study could also be extended by including more interviews to get more qualitative information that could help explain some of the quantitative results. In addition, it would be recommended to work with a community health volunteer or other community workers that know the area well and already have a trusting relationship with the community where the study is being conducted. In the future, the data could be analyzed further using statistical software to find patterns between demographic information and perception of the HIV vaccine. For instance, the effect gender, religion, income level, and location of the study participants has on their perception could be explored and investigated, but currently, this was not possible due to time constraints.

Policy and Education

It became evident throughout the study that basic vaccine information was lacking in the communities where the studies were implemented, and large-scale vaccine education programs could be beneficial to the community so that community members know how vaccines work, what vaccines they are receiving, the importance of vaccines, and the efficacy of vaccines. In addition, education programs related to the HIV vaccine will most likely be necessary to have a truly successful vaccination campaign. There were misconceptions that a HIV vaccine can cure HIV, and information like this needs to be corrected before the vaccine comes to market so that there is a smooth transition between vaccine release and large-scale vaccination of communities.

Community health volunteers can also be trained and utilized to implement the large-scale vaccine education campaigns, as well as to vaccinate individuals in the communities. Also, health facilities need systems for maintaining inventory of essential medications and vaccines in place now for the successful implementation of a HIV vaccination campaign in the future. Kenya needs to improve the issues with the healthcare system now rather than later, or many Kenyan citizens could miss out on the vaccine when it becomes available. This will require Kenya to improve healthcare policy related to vaccine awareness and administration.

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Appendix A
English Surveys and Interview Questions

Section 1: This sections aims to get a summary of your demographic information and vaccination history. Please answer this section to the best of your ability.

1. Are you over the age of 18?
 - i. Yes
 - ii. No
2. What is your highest attained level of education?
 - a. No schooling
 - b. Primary school
 - c. Secondary school
 - d. College
 - e. Degree
3. What is your religion?
 - a. Anglican
 - b. Catholicism
 - c. Islam
 - d. Buddhism
 - e. Baha'i
 - f. Presbyterian
 - g. Reformed
 - h. Methodist
 - i. Baptist
 - j. Lutheran
 - k. Pentecostal
 - l. Eastern Orthodox
 - m. New Apostolic Church
 - n. Seventh-day Adventist Church
 - o. Jehovah's Witnesses
 - p. United Pentecostal Church
 - q. Branhamism
 - r. The Church of Jesus Christ of Latter-days Saints
 - s. Hinduism
 - t. No religion
 - u. Traditional Religion
4. What is your age?
 - a. 18-20
 - b. 21-25
 - c. 26-30
 - d. 31-35
 - e. 36-40
 - f. 41-45

- g. 46-50
 - h. 51-55
 - i. 56-60
 - j. 61-65
 - k. 66-70
 - l. 71-75
 - m. 76-80
 - n. 81-85
 - o. 86-90
 - p. 91-95
 - q. 96-100
 - r. 100+
5. Where do you live?
- a. Kisumu County
 - b. Siaya County
6. Do you own property?
- a. Yes
 - b. No
7. What is your gender?
- a. Male
 - b. Female
8. Have you received immunizations in the past?
- a. Yes
 - b. No
9. If yes, were these immunizations given in childhood or adulthood?
- a. Childhood
 - b. Adulthood
 - c. Both childhood and adulthood
 - d. Not applicable
10. What diseases have you been vaccinated against? (Please answer this question to the best of your ability)
- a. Adenovirus
 - b. Anthrax
 - c. Diphtheria
 - d. Hepatitis A
 - e. Hepatitis B
 - f. Haemophilus influenza type b (Hib)
 - g. Human Papillomavirus
 - h. Seasonal Influenza (Flu)
 - i. Japanese Encephalitis
 - j. Measles
 - k. Meningococcal
 - l. Mumps
 - m. Pertussis
 - n. Pneumococcal
 - o. Polio

- p. Rabies
- q. Rotavirus
- r. Rubella
- s. Shingles
- t. Smallpox
- u. Tetanus
- v. Tuberculosis
- w. Typhoid Fever
- x. Varicella
- y. Yellow Fever

Section 2: This section aims to investigate your opinions regarding vaccines. Please answer truthfully.

1. Do you feel vaccines are generally good or bad?
 - a. Good
 - b. Bad
 - c. Not sure
2. Do you feel that vaccines have harmful effects?
 - a. Yes
 - b. No
 - c. Not sure
3. Do you feel that vaccines should be available free of cost?
 - a. Yes
 - b. No
 - c. Not sure
4. Do you trust the health care system?
 - a. Yes
 - b. No
 - c. Not sure
5. Do you support compulsory vaccination programs?
 - a. Yes
 - b. No
 - c. Not sure

Section 3: This sections aims to investigate your opinions surrounding HIV/AIDS. Please answer truthfully.

1. Do you have a negative or positive view of people with HIV?
 - a. Positive
 - b. Negative
 - c. Neutral
 - d. Not sure
2. Can you contract HIV through injection drug use?
 - a. Yes
 - b. No
 - c. Not sure
3. Do you believe you can contract HIV from sexual contact?

- a. Yes
 - b. No
 - c. Not sure
4. Do you believe a baby can be born with HIV if the mother is HIV-positive?
- a. Yes
 - b. No
 - c. Not sure

Section 4: This section aims to investigate your opinions on a possible HIV vaccine that could be available in the future. Please answer trustfully.

1. If a HIV Vaccine were available, would you get immunized?
 - a. Yes
 - b. No
 - c. Not sure
2. If a HIV vaccine were available, would you get your child immunized?
 - a. Yes
 - b. No
 - c. Not sure
3. If a HIV vaccine were available, would you get immunized if it required one dose to be fully effective?
 - a. Yes
 - b. No
 - c. Not sure
4. If a HIV vaccine were available, would you get immunized if it required two doses to be effective?
 - a. Yes
 - b. No
 - c. Not sure
5. If a HIV vaccine were available, would you get immunized if it required three or more doses to be fully effective?
 - a. Yes
 - b. No
 - c. Not sure
6. If a HIV Vaccine was available, would you stop using condoms during sex if immunized?
 - a. Yes
 - b. No
 - c. Not sure
7. If an HIV Vaccine was available and you were immunized, would you engage in riskier sexual behavior?
 - a. Yes
 - b. No
 - c. Not sure
8. If an HIV vaccine was available and you were immunized, would you engage in behavior you did not engage in previously?

- a. Yes
 - b. No
 - c. Not sure
9. If men were to be immunized with an HIV vaccine, do you think that they would still get circumcised?
- a. Yes
 - b. No
 - c. Not sure
10. Would you be concerned about how your sexual partner would react to you getting an HIV vaccine?
- a. Yes
 - b. No
 - c. Not sure
11. Would you be concerned about how your family would react to you getting an HIV vaccine?
- a. Yes
 - b. No
 - c. Not sure
12. Would you get a HIV vaccine if it was not 100% effective against the virus?
- a. Yes
 - b. No
 - c. Not sure
13. Do you think a HIV vaccine would lead to less people becoming infected with HIV?
- a. Yes
 - b. No
 - c. Not sure
14. Are HIV vaccines more important for children or adults?
- a. Children
 - b. Adults
 - c. Not sure
15. Are HIV vaccines more important for men or women?
- a. Men
 - b. Women
 - c. Not sure
16. Do you think an HIV vaccination is better than PrEP?
- a. Yes
 - b. No
 - c. Not sure
17. Would you support a compulsory HIV vaccine for all children?
- a. Yes
 - b. No
 - c. Not sure
18. Would you support a compulsory vaccine for all HIV negative adults?
- a. Yes
 - b. No
 - c. Not sure
19. Would you support a compulsory vaccination program for all HIV negative adults and children?
- a. Yes

- b. No
- c. Not sure

Appendix B
Swahili Survey and Interview Questions

Chanjo maswali ya uchunguzi

Sehemu ya kwanza: Sehemu hii inalenga kuhusu maisha yako kwa ufupi na mambo kuhusu chanjo. Tafadhali jibu maswali haya (hizi) uwezavyo.

1. Una miaka zaidi ya kumi na nane?
 - a. Ndiyo
 - b. Hapana
2. Umesoma mpaka wapi?
 - a. Sijaenda Shuleni
 - b. Primary school
 - c. Secondary school
 - d. College
 - e. Degree
3. Wewe ni wa dini gani? Yani.
 - a. Anglican
 - b. Catholicism
 - c. Islam
 - d. Buddhism
 - e. Baha'i
 - f. Presbyterian
 - g. Reformed
 - h. Methodist
 - i. Baptist
 - j. Lutheran
 - k. Pentecostal
 - l. Eastern Orthodox
 - m. New Apostolic Church
 - n. Seventh-day Adventist Church
 - o. Jehovah's Witnesses
 - p. United Pentecostal Church
 - q. Branhamism
 - r. The Church of Jesus Christ of Latter-days Saints
 - s. Hinduism
 - t. No religion
 - u. Traditional Religion
4. Una miaka mingapi?
 - a. 18-20

- b. 21-25
 - c. 26-30
 - d. 31-35
 - e. 36-40
 - f. 41-45
 - g. 46-50
 - h. 51-55
 - i. 56-60
 - j. 61-65
 - k. 66-70
 - l. 71-75
 - m. 76-80
 - n. 81-85
 - o. 86-90
 - p. 91-95
 - q. 96-100
 - r. 100+
5. Unakaa wapi/yani unaishi wapi?
- a. Kisumu County
 - b. Siaya County
6. Unamiliki nyumba/yani una nyumba yako?
- a. Ndiyo
 - b. Hapana
7. Wewe ni wa jinsia gani (yani wewe ni mwanamke au mwanaume)?
- a. Mwanaume
 - b. Mwanamke
8. Umewahi kupata chanjo mbeleni?
- a. Ndiyo
 - b. Hapana
9. Kama/ikiwa ndiyo, ulipata chanjo wakati ulikuwa mtoto au mtu mzima?
- a. Mtoto
 - b. Mtu mzima
 - c. Wakati ulikuwa mtoto na mtu mzima
 - d. Sikupata chanjo yoyote
10. Ulipata chanjo dhidi ya magonjwa gani? (Tafadhali jibu maswali haya (hizi) uwezavyo.)
- a. Adenovirus
 - b. Anthrax
 - c. Diphtheria
 - d. Hepatitis A
 - e. Hepatitis B
 - f. Haemophilus influenza type b (Hib)
 - g. Human Papillomavirus
 - h. Seasonal Influenza (Flu)
 - i. Japanese Encephalitis

- j. Measles
- k. Meningococcal
- l. Mumps
- m. Pertussis
- n. Pneumococcal
- o. Polio
- p. Rabies
- q. Rotavirus
- r. Rubella
- s. Shingles
- t. Smallpox
- u. Tetanus
- v. Tuberculosis
- w. Typhoid Fever
- x. Varicella
- y. Yellow Fever

Sehemu ya pili: Hii sehemu inalenga kujua maoni yako kuhusu chanjo. Tafadhali jibu maswali haya na sema ukweli.

1. Unafikiri kwa ujumla chanjo ni nzuri au ni mbaya?
 - a. Nzuri
 - b. Mbaya
 - c. Sijui
2. Unafikiri chanjo zina madhara kwa afya?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui
3. Unafikiri chanjo zinahitaji kuwa bure?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui
4. Unaamini utaratibu wa afya?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui
5. Unakubaliana na chanjo za lazima?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui

Sehemu ya tatu: Hii sehemu inalenga kujua maoni yako kuhusu HIV/AIDS (ukimwi). Tafadhali jibu maswali haya na sema ukweli.

1. Uko sawa au huko sawa na watu ambao wana HIV?
 - a. Niko sawa
 - b. Siko sawa
 - c. Hakuna msimamo
 - d. Sijui
2. Unaweza kupata HIV kupitia kwa sindano ya madawa ya kulevya?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui
3. Unaweza kupata HIV kupitia kwa kufanya mapenzi (ngono)?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui
4. Unaamimi mtoto anaweza kuzaliwa na HIV ikiwa mama yake ana HIV?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui

Sehemu ya nne: Hii sehemu inalenga kujua maoni yako kuhusu kama chanjo ya HIV/AIDS (ukimwi) itaweza kupatikana siku za usoni (siku za bada ye). Tafadhali jibu maswali haya na sema ukweli.


1. Kama kuna chanjo ya HIV ungependa kuchanjwa?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui
2. Kama kuna chanjo ya HIV ungependa mtoto wako kuchanjwa?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui
3. Kama kuna chanjo ya HIV ungependa kuchanjwa mara moja ili ifanye kazi vizuri mwilini?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui
4. Kama kuna chanjo ya HIV ungependa kuchanjwa mara mbili ili ifanye kazi vizuri mwilini?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui
5. Kama kuna chanjo ya HIV ungependa kuchanjwa mara tatu au zaidi ili ifanye kazi vizuri mwilini?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui

6. Kama kuna chanjo ya HIV ungependa kuacha kutumia condom kama umechanjwa?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui
7. Kama kuna chanjo ya HIV na umechanjwa ungependa kuhatarisha maisha yako ukifanya mapenzi (ngono)?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui
8. Kama kuna chanjo ya HIV na umechanjwa ungependa kuhatarisha maisha yako ukifanya mapenzi (ngono) kuliko zamani?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui
9. Kama wanaume wangechanjwa na chanjo ya HIV unafikiri bado wangetahiriwa?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui
10. Ungejali vile mwenzio wa ngono (yani yule unafanya mapenzi naye) angekuchukulia kama angejua kwamba umepata chanjo ya HIV?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui
11. Ungejali vile familia yako ingekuchukulia kama ingejua kwamba umepata chanjo ya HIV?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui
12. Ungechanjwa kama ungejua kwamba chanjo ya HIV si asilimia mia moja kwa ubora?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui
13. Unafikiri chanjo ya HIV itasaidia kupunguza idadi ya watu ambao wanaumbukizwa virusi (HIV)?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui
14. Chanjo ya HIV ni muhimu kwa watoto au watu wazima?
 - a. Watoto
 - b. Watu wazima
 - c. Sijui
15. Chanjo ya HIV ni muhimu kwa wanawake au wanaume?
 - a. Wanaume
 - b. Wanawake
 - c. Sijui

16. Unafikiri chanjo ya HIV ni bora kuliko PrEP?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui
17. Ungekubaliana na mpango wa chanjo ya lazima kwa watoto wote?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui
18. Ungekubaliana na mpango wa chanjo ya lazima kwa watu wazima wote ambao hawana virusi (HIV)?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui
19. Ungekubaliana na mpango wa chanjo ya lazima kwa watu wazima wote ambao hawana virusi (HIV) na watoto wote?
 - a. Ndiyo
 - b. Hapana
 - c. Sijui

Appendix C
English Consent Form

SIT Study Abroad
a program of World Learning



CONSENT FORM

1. Purpose of this study

The purpose of this study is to investigate the opinions surrounding the HIV vaccine in particular the acceptability of the HIV vaccine, possible behavior changes that could result from the vaccine coming to market, and the support of a compulsory HIV vaccine. The researcher will collect data by utilizing surveys and interviews on opinions surrounding the HIV vaccine.

2. Rights Notice

In an endeavor to uphold the ethical standards of all SIT ISP proposals, this study has been reviewed and approved by a Local Review Board or SIT Institutional Review Board. If at any time, you feel that you are at risk or exposed to unreasonable harm, you may terminate and stop the interview. Please take some time to carefully read the statements provided below.

- a. **Privacy** - all information you present in this interview may be recorded and safeguarded. If you do not want the information recorded, you need to let the interviewer know.
- b. **Anonymity** - all names in this study will be kept anonymous unless the participant chooses otherwise. Community of study participants may be used in the paper, and direct quotes can be used in the paper. If the study participant does not consent to this, then the study participant should inform the interviewer.
- c. **Confidentiality** - all names will remain completely confidential and fully protected by the interviewer. By signing below, you give the interviewer full responsibility to uphold this contract and its contents. The interviewer will also sign a copy of this contract and give it to the participant.

Participant's name printed

Participant's signature and date

Interviewer's name printed

Interviewer's signature and date

3. Acknowledgement and Disclosure of HIV Vaccine Information

The HIV vaccine is not currently on the market, and the immunization is not available to the general public. The HIV vaccine is projected to be on the market for public immunization within the next five to ten years. By signing below, you acknowledge that you understand the the HIV Vaccine is currently not available to the the general public.

Participant's name printed

Participant's signature and date

Interviewer's name printed

Interviewer's signature and date

Appendix D
Swahili Consent Form

SIT Study Abroad
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Fomu ya idhini

4. Lengo la huu uchunguzi

Lengo la huu uchunguzi ni kuchunguza maoni kuhusu chanjo ya HIV pamoja na kukubali. Chanjo ya HIV, uwezekano wa mabadiliko ya tabia ambayo inaweza kuleta matokeo kutoka kwa chanjo ambayo itapatikana na uungaji mkono wa lazima wa hii chanjo. Mtafiti atakusanya maelezo (data) kwa kutumia maswali na mahojiano.

5. Haki za Ilani

Katika juhudi za kutekeleza viwango vya maadili ya mapendekezo yote ya uchunguzi wa SIT. Uchunguzi huu umekaguliwa na kupitishwa na kamati au taasisi ya uangalizi ya SIT. Kama kwa wakati wowote ule unahisi kwamba uko hatarini unaweza kukatiza haya mahojiano. Tafadhali chukua wakati wako kwa makini na usome maelezo hapo chini.

- d. **Faragha** – Maelezo yote utakayotoa katika mahojiano haya yanaweza kurekodiwa na kuhifadhiwa. Kama hutaki maelezo haya kurekodiwa unahitaji kumwelezea mwenye kukuhoji.
- e. **Kutojulikana** - majina yote katika uchunguzi huu hayatajulikana isipokuwa kama mhusika (mhojiwa) anaamua yajulikane. Jamii ya wahusika wa uchunguzi inaweza kutumiwa katika uchunguzi na yale yatakayotolewa yataweza kutumiwa katika huu utafiti moja kwa moja. Kama mhusika hatoi idhini, kwa hivyo mhusika wa uchunguzi anahitaji kumwambia mwenye kumhoji.
- f. **Usiri** – Majina yote yatawekwa kwa siri kabisa na kulindwa kabisa na mwenye kukuhoji. Kwa kutia sahihi hapo chini unampa mwenye kukuhoji jukumu kamili la kutekeleza huu mkataba na yaliyomo. Mwenye kukuhoji atatia sahihi kwenye hii nakala (kopi) kumkabidhi mhusika (mhojiwa) nakala hii.

Jina la mhusika

Sahihi ya mhusika na terehe

Jina la mwenye kuhoji

Sahihi mwenye kuhoji na terehe

6. Kukubali na kueleza maelezo ya chanjo ya HIV

Chanjo ya HIV haitumiki na kuchanjwa hakupatikani kwa watu wote. Chanjo hii inakusudiwa kutumika baada ya miaka mitano au kumi ijayo. Kwa kutia sahihi hapo chini unakubali kwamba unafahamu chanjo ya HIV kwa sasa haipatikani kwa watu wote.

Jina la mhusika

Sahihi ya mhusika na terehe

Jina la mwenye kuhoji

Sahihi mwenye kuhoji na terehe

Appendix E

Focus Group Questions

English:

1. In Kenya, how do you believe immunizations are viewed?
2. Do you think HIV is a major problem in Kenya?
3. What kind of people get HIV?
4. Considering the fact HIV can be transmitted through sexual intercourse, would you be willing to have your children vaccinated for HIV?
5. If the HIV vaccine is released to the general public, do you think the HIV vaccine should be compulsory? Why or why not?
6. Who do you think most needs to be vaccinated?

Kiswahili:

1. Katika Kenya unafikiri watu wanachukuliaje chanjo?
2. Unafikiri HIV (virusi) ni shida kubwa katika Kenya?
3. Ni watu aina gani wanapata virusi (HIV)?
4. Ikilinganishwa kwamba virusi (HIV) vinaweza kuambukizwa kupitia kufanya mapenzi (yani ngono) ungependa watoto wako wapate chanjo ya virusi (HIV)?
5. Chanjo ya virusi (HIV) ikiletwa kwa raia unafikiri chanjo itahitaji kuwa ya lazima? Kwa nini ndiyo na kwa nini hapana?
6. Unafikiri nani zaidi anahitaji kuchanjwa?

Appendix F

ISP Daily Journal

Independent Study Project Daily Journal**Week #1: (13/11/2017-19/11/2017)**

Monday: Today, I met with the community health volunteer that Vincent Obiero from KEMRI connected me with to work on the study, Ayub Saidi. We discussed the location of the study, the way we would collect surveys, and the way we would recruit people for focus groups. We decided to use other CHVs to recruit people and organize the focus groups. The surveys will be conducted by going to homes of people in Kondele that are either low-income or middle-income. We are still brainstorming on how to collect surveys and organize the focus group for the high-income group.

Tuesday: We visited the assistant chief of Kondele to get his approval and consent to conduct the study in Kondele, and he gave us a stamped letter that showed his approval. We then conducted a few surveys to test the length of time it would take in the field and how people would respond to being asked to complete a survey. Overall, it went well, and we had a very positive response to asking people to complete the survey. As we left Kondele, we visited the chief of the area to greet him, and he gave his approval for the study as well. We traveled back into town, and later in the day the CHV came back into town to get survey materials for the next day.

Wednesday: Today the CHV conducted surveys on his own in Kondele, and in the afternoon, he brought the surveys that were completed into town for me to receive. I input this data into a google form I have set up to track the data and generate a spreadsheet. I gave the CHV the surveys that were going to be conducted the next day.

Thursday: The CHV conducted the surveys today, and he delivered them to me in the afternoon. I used this time to create an excel sheet with tables that will be used later for chi-squared test of independence when the data is tallied and an analysis is run. I input the data that the CHV gave me into my google form online.

Friday: Today, we had a focus group with people from the Kondele area who are low-income. Thirteen people attended the focus group at the church, and they answered the six focus group questions that I wrote. I got really good responses from them, but it became clear that many members of the focus group lacked basic information about vaccines. I noted the responses in addition to the questions they asked me at the end of the focus group. After this, the CHV and I conducted surveys for the people in Kondele who are middle-income. It was challenging to find people, but we ended up having a total of 17 surveys for the day which was on target. The CHV conducted some surveys the night before and gave me those surveys today.

Saturday: Today, I met the CHV in Kondele, and we conducted more surveys for the people who live in Kondele that are middle income. We were able to get 16 surveys, and I commonly got a request to keep my pen from men that we surveyed, as well as questions about whether there was compensation for the survey. I traveled back to town after these surveys were finished. I took note of an interesting statement that one of the women completing the survey mentioned. She said in Swahili: the vaccine will increase promiscuousness so we should not have it.

Sunday: Today I did not conduct any surveys or analysis.

Week #2: (20/11/2017-26/11/2017)

Monday: Due to the election result being announced today, I stayed in my homestay all day, but I did not have any Wi-Fi to conduct work or enter data. My CHV met me at my house in the morning, and I gave him the materials to conduct the focus group for the middle-income people that live in Kondele. He conducted the focus group, and he said he will give me the responses tomorrow when we meet in person if there is no tension in the Kondele area.

Tuesday: Today, I met the CHV at the SIT office, and he gave me the responses of the participants of the focus group. After that, we decided to go talk to the churches about conducting the surveys for the high-income group. We went to the office of St. Stephen's cathedral, and one of the church leaders gave us her consent to bring surveys to church on Sunday to collect views. She will announce about the survey after the service. However, she also suggested giving the survey to a member of the Millimani fellowship, such as my host mom, and distributing and collecting the survey at the fellowship. She also suggested traveling to Aga Khan Hospital to ask if we could interview or conduct focus groups there. At Aga Khan, we inquired at the front desk, and the man sent us to talk to the Executive Secretary who gave her consent. The head of nurses for the mother and baby clinic, where the surveys would be conducted while women waited for services, needed to give her consent. However, she was in a meeting, so the Executive Secretary said she would contact us when she checked with her. I am still waiting to hear back from her to see if we can survey and interview there. The CHV and I agreed that we would try to conduct as many surveys as possible at Aga Khan, and then get the rest of the surveys at church and the fellowship. We also agreed to do short interviews with about ten women in the clinic in place of a focus group because this would be a more feasible way to collect views. The same focus group questions will be used for these interviews. If we get approval, we will start these surveys on Thursday, but if we do not, then we will try to do the surveys at the fellowship while rethinking another way to conduct the focus group or the interviews. I spoke with the CHVs from Simenya tonight, and I am going to meet with them on Monday morning to go over the plan.

Wednesday: I have contacted the woman from Aga Khan Hospital, and she said that the documents I left her with are being reviewed by the head of nursing. She said she would contact me with an update by the end of the day, but I never received any contact by the close of business. I used this time to input the data from my surveys and to reach out to my advisor about a meeting at the end of this week to review the data I have collected before moving out to Siaya county. Ayub and I agreed to visit Aga Khan in person tomorrow at 10AM to get an update on the approval of doing surveys there in the hopes that we can start surveying tomorrow if

possible. I am hoping to be able to complete all of the surveys and interviews at Aga Khan by Friday so that I do not have a delay in moving out to Siaya.

Thursday: Today, the CHV and I visited Aga Khan Hospital to get an update in person, and they informed us that the study will need to be approved at a weekly meeting for us to be able to survey at their facility. This will take too long due to the fact that I am traveling out to Simenya on Sunday. We also visited the Catholic church in Millimani, and they gave us approval to survey. They will call people ahead of time to let them know that we will be surveying them on Sunday.

Friday: The man from the church called me this morning asking for an unreasonable amount of money for transportation because he will need to travel back to Kisumu to help us. However, he only needs to call the people, and we will survey them on Sunday. I have decided to eliminate the high-income group because it is proving too difficult to find an institution to recruit people from for research. Door-to-door research is not feasible for this income bracket. I am hesitant to get views from only one church as well due to bias. The CHV and I have decided to survey the rest from low-income and middle-income parents in Kondele. Since I am not able to go to Kondele due to the election, the CHV will conduct the surveys, and then, he will deliver them to me when I return from Simenya most likely. I am hoping to meet with my advisor later today or tomorrow to discuss the data that has been found so far.

Saturday: I retrieved the surveys from the Catholic church this morning since we are no longer going to survey the high-income income group. The CHV and I met to discuss the plan moving forward, and he will be surveying 28 more people from the low-income and middle-income groups within Kondele. This will bring us to 100 surveys, and I will receive these surveys when I return from Simenya.

Sunday: Today, I traveled out to Simenya to start surveys in the rural area.

Week #3: (27/11/2017-3/12/2017)

Monday: Today, I met with the CHV I will be working with, Monica Atieno, at the Simenya Dispensary. The management staff at the dispensary informed us that I need to get county approval for the study to be able to move freely throughout Siaya county to survey. The CHV and I traveled to the Ministry of Health Office in Siaya. They told us that we can start to survey people, and we can pick up the county approval letter later in the week. We then traveled to Sidindi where Monica is based, and we surveyed about 20 people in the market area. After this, I traveled home and attempted to get in contact with the other CHV that I was connected with in the area, but she never showed up to the meeting we scheduled for the evening.

Tuesday: Due to the inauguration today, the CHV and I agreed that it would be best to remain at home for the day and pick up surveying again tomorrow.

Wednesday: Today, we surveyed people at their homes in the village of Sidindi, as well as in the market place in Sidindi because it was market day in the village. We walked around the market and gave surveys to people who were selling goods, and then the sellers returned the surveys to us when completed. We completed about 25 surveys today, and I have about 54 surveys

completed so far. There were some issues with the community health volunteer not understanding that the survey participants need to be parents with children, but all the surveys that I have witnessed being conducted have gone to people who look old enough to be parents and verbally told me they had children. However, I think I am going to administer extra surveys to compensate for the small amount that may have not had children who were surveyed. I also realized one of the surveys was completed by someone who was under 18 so this survey cannot be used. I set up a meeting with the CHV for Simenya that I was connected with, but she did not show up again for the meeting. I am going to proceed by just working with the CHV for Sidindi, and we have planned to finish the surveys tomorrow. The CHV is scheduling a focus group for Friday, as well as a trip to the Siaya County Ministry of Health to retrieve the Siaya County approval for the study.

Thursday: I met the CHV this morning at her homestead, and she gave me the surveys that she picked up last evening. We walked to about five households that she is in charge of as a CHV, and people at each of these houses took the survey. We ran into a man on the way out of one of the households that was not happy about me being there and asked my intentions in doing research in this community. The man was clearly very drunk, and Monica and I kept moving from household to household. Monica had to go to a meeting in Simenya, so we stopped surveying around 11:30AM. However, I gave Monica the remaining surveys, and she is going to complete them this evening so that I can pick them up tomorrow when we conduct the focus group.

Friday: This morning I talked to the person in charge of research for the Siaya County Department of Health, and she informed me that she needed my protocol in order to review the study to give it approval from the county. I met with Monica, where she gave me surveys she completed yesterday evening, and we traveled to Ugun'ja. I printed the protocol in Ugun'ja, which was just the draft proposal because she needs a hard copy for the records. Also, I attended an event for World AIDS Day in Ugun'ja, and then, the CHV and I traveled back to Sidindi where we conducted a focus group to gather their views in relation to the HIV vaccine. The focus group went well, and we were able to gather data, as well as answer questions the participants had about the vaccine.

Saturday: Today I rested, and I edited the methodology section of the paper, as well as went through the paper and noted the parts of the paper I still need to write and edit.

Sunday: I did not work on my ISP today.

Week #4: (4/12/2017-10/12/2017)

Monday: I went to the Siaya County Health Department this morning, and they informed me that the head of research was at Siaya County Club for a meeting. I traveled to Siaya County Club to give her my protocol, and I met with her briefly to discuss the study. She informed me that she would talk with Steve about the study, and she indicated that I would get the letter by email later in the week. I then traveled to Kisumu, where I extended my visa, and I communicated with the Community Health Volunteer I am working with in Kisumu to arrange a meeting for tomorrow to pick up the completed surveys from him. I emailed my professor from the United States to ask

for sample R code for a chi-squared test of independence in order to analyze the data in a more effective manner.

Tuesday: Today I input all of the data from the surveys into the google form that I created online, and then, I exported this data into an excel spreadsheet for further analysis.

Wednesday: I worked on the paper today, and I met with my advisor in the afternoon to discuss the project results and the paper. He gave me a lot of valuable feedback and helped to create a plan for writing the discussion section of the paper. I continued to work on the paper after this meeting.

Thursday: I continued to work on the paper, and I start to proofread the paper.

Friday: Today I edited my paper, and I created my presentation for Monday.

Appendix G
ISP Review Sheet

KENYA: URBANIZATION, HEALTH AND HUMAN RIGHTS

ISP REVIEW SHEET

This page should be completed and attached to your ISP paper as the final page. It is for the use of future SIT students interested in your topic and is intended to give them nuts and bolts information about the types of problems they can expect in the field, as well as the suitability of both the topic and the ISP site.

1. Your topic – suitability, development, accessibility

My topic was Community Perception of the HIV Vaccine in Western Kenya, and the topic was actually easy to develop with the help of my advisor and the SIT staff. I originally was going to surveys and interviews, but the local community health volunteer suggested focus groups which worked really well. People were very accessible to survey, and I did not encounter any barriers to field work except for the issues with the election.

2. Location of field study – where you conducted your field study, who helped set it up (who was helpful and who was not, include names, addresses, and phone numbers), strengths and weaknesses of the site

I did my fieldwork in Kondele in Kisumu County and in the village of Sidindi in Siaya County. I was connected with community health volunteers in each of these areas. Vincent Obiero (vobiero@kemricdc.org) from KEMRI set me up with the CHV in Kisumu, while Babu set me up with the CHV in Siaya. The CHV in Kisumu, Ayub Saidi, was extremely helpful and valuable. He would also travel into town to give me surveys that he conducted and to meet, which was very helpful. The CHV in Siaya, Monica, was very good, but she was consistently 2-3 hours late for any meeting we had. The Quality Assurance Officer in Siaya County for the study approval was extremely slow and not very helpful. Kondele was an extremely good place to collect surveys because there was a large amount of people in a small space, and the market in Sidindi was a good place to collect a lot of surveys at one time as well. My advisor, Victor Mudhune, was also very helpful, and he provided feedback on my paper at multiple stages, as well as helped me create a plan for my discussion section after collecting my results.

3. Nuts and bolts – where to get water & food, where to stay, bugs & other critters, other problems

I stayed with my previous homestay families in both Kisumu and Siaya, and I did not encounter any issues with either of the homestays up to this point. They provided me with breakfast and dinner. In Kisumu, I would get lunch in the CBD, and in Siaya, I would go to my homestay for a snack or lunch. My homestay families had water at their homes, so I would fill up my bottles there.

4. Other noteworthy comments

I have no other noteworthy comments.