

# Constraints of Effective Uptake of Antiretroviral Drugs in Informal Settlements in Kenya: Case of Kangemi Slum in Nairobi

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**Abstract:** *Discovery of anti-retroviral therapy (ART) came as part of the effort to deal with HIV AIDs epidemic. ART reduces the viral load in HIV positive individuals hence minimizing the chances of spreading the virus as well as reducing the chances of contracting illnesses and AIDS-related diseases in HIV positive individuals. The problem, however, has been the low uptake of ARVs especially in developing countries. This study investigates the constraints to effective uptake of ARVs in Kenya using Kangemi, an informal settlement located in Nairobi County as a case study. Primary data was collected and analyzed quantitatively. Stigma was found to be the major constraint to the uptake of ARVs by HIV positive individuals. Education level was another but minor constraint. More awareness, especially by government agencies, is needed for people to understand the need to be tested and the benefits of taking ARVs.*

**Keywords:** DNA – Deoxyribonucleic Acid, RNA – Ribonucleic Acid, T-cell, Human Immunodeficiency Virus (HIV), anti-retroviral therapy (ART).

## 1. Introduction

Human Immunodeficiency Virus, also known as HIV, is a retrovirus that persistently attacks the body's immune system thus decreasing the number of T-cells present within the body ("What Are HIV and AIDS?"). HIV cannot survive on its own; therefore, the virus attaches to the T-cell and releases its genetic material, and consequently HIV, into the cell ("How HIV Infects the Body and the Lifecycle of HIV"). The virus converts its RNA to DNA through reverse transcriptase to create a double stranded DNA (Morie). The viral DNA enters the nucleus of the T-cell and integrates itself into the original DNA of the T-cell ("How HIV Infects the Body and the Lifecycle of HIV"). The infected DNA is transcribed and translated to create HIV proteins that are released from the cell to infect other cells ("How HIV Infects the Body and the Lifecycle of HIV"). This is detrimental to the body's health as T-cells are essential in maintaining a strong immunity as they destroy infected cells and stimulate immune responses to attack foreign and harmful cells (Perdue and Humphrey).

Unfortunately, HIV is currently an incurable disease; however, developments in medicine are being made that lessen the effects of HIV thus allowing the affected individuals to live longer and healthier lives. Antiretroviral drugs, also known as ARV's, are drugs that are used to lower the amount of HIV inside the body. ARV treatment is unique based on each individual's stage of HIV and their body's reaction to the treatment. Different combinations of ARV drugs are prescribed by healthcare specialists, and the affected individual's viral load and T-cell count are monitored to determine whether the treatment is working ("Monitoring and Switching Antiretroviral Treatment for HIV"). If not, doctors would try to decipher if there are any possible complications or they would recommend a different combination of ARV drugs that may better suit the affected individual ("Monitoring and Switching Antiretroviral Treatment for HIV"). It is important to note that ARV's are not a cure for HIV. Rather, they help decrease the amount of HIV, and thus increase the amount of T-cells, present within the body of the affected individual ("Starting Antiretroviral Treatment for HIV"). This improves the health of the

affected individual by strengthening the immune system of the affected individual, and decreasing the chances of spreading the virus ("Starting Antiretroviral Treatment for HIV"). Therefore, ARV's permit affected individuals to enjoy normal and healthy lives.

According to data from UNAIDS, in 2017, approximately 1.5 million individuals in Kenya were suffering from HIV. ("HIV and AIDS in Kenya") Out of the 1.5 million affected individuals, 75% of the adults and 82% of the children were undergoing ARV treatment ("HIV and AIDS in Kenya"). Furthermore, research has been conducted in Kenya that concluded that HIV prevalence is greater in slum areas than in non-slum areas due to poor sanitation, certain cultural practices, and unhealthy sexual conduct (Madise et al.). Kangemi is one of the biggest slums in Nairobi, Kenya with over 100,000 residents (Mynott). Due to the poor living conditions, the spread and contraction of HIV becomes more daunting for individuals living in these residences (Madise et al.).

Research has shown that residents of slum areas in Kenya have a higher risk of contracting HIV (Madise et al.). Additionally, from the 2017 UNAIDS data, it is evident that not everyone in Kenya who is HIV positive is making use of ARV drugs despite its benefits. HIV can be a fatal and painful virus as it weakens the immune system, preventing it from fighting off infections and diseases. In addition, for the past few years, the number of individuals affected by HIV has continued to grow ("HIV and AIDS in Kenya"). Therefore, it is necessary to determine why affected individuals, especially in locations with high HIV rates and risks, such as slums, have not sought treatment as ARV's not only decrease the chances of spreading the virus, but also pave way for a healthier and longer life.

### 1.1. Problem statement

HIV has been a major problem in the world for many decades. Research shows that since the beginning of the disease, approximately 77.3 million people in the world have suffered from HIV of which approximately 35.4 million have died ("Global HIV and AIDS Statistics – 2018 Fact

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Sheet"). Antiretroviral drugs have been developed to aid in limiting the effects and spread of HIV ("Starting Antiretroviral Treatment for HIV"). This provides the patients with the opportunity to live longer, healthier, and normal lives. According to UNAIDS, 1.5 million people in Kenya were living with HIV in 2017 ("HIV and AIDS in Kenya"). Approximately 75% of HIV positive adults and approximately 82% of HIV positive children sought antiretroviral treatment ("HIV and AIDS in Kenya"). Furthermore, statistics show that slum areas in Kenya have a higher prevalence of HIV than non-slum locations (Madise et al.). This is due to unhealthy sexual conduct, cultural practices, and unhygienic conditions. Data shows that HIV prevalence is 12% in Nairobi slums, 5% in urban non-slum locations, and 6% in rural areas (Madise et al.).

Based on this data, not everyone who is HIV positive is taking ARV's. Additionally, slum areas have a higher risk factor of HIV; therefore, it is necessary for affected individuals to seek treatment to avoid further spread of the virus and for them to lead healthier lifestyles (Madise et al.). Hence, there is need to determine why individuals in slum areas are not using ARV drugs despite their benefits.

## 1.2. Research Objectives

- To establish the extent by which dissemination and comprehension of information on ARV drugs affects uptake of the drugs in Kangemi Slum, Kenya.
- To establish the extent by which stigma related to HIV affects the uptake and usage of ARV drugs in Kangemi Slum, Kenya.
- To establish the extent by which efficient availability of ARV drugs in government hospitals influences the uptake and usage of the drugs in Kangemi Slum, Kenya.

## 1.3. Research questions

- To what extent does dissemination and comprehension of information on ARV drugs affect the uptake of the drugs in Kangemi Slums in Nairobi County, Kenya?
- Does stigma related to HIV affect the uptake and usage of ARV drugs in Kangemi Slums in Nairobi County, Kenya?
- Does efficient availability of ARV drugs in government hospitals influence the uptake and usage of the drugs in Kangemi Slums in Nairobi County, Kenya?

## 1.4. Scope of Study

The study primarily focused on the constraints of ARV usage in the Kangemi slum located in Nairobi, Kenya. This provided information on what factors were preventing HIV positive adults from using ARV drugs in the Kangemi slum area. The research was limited to adults living in the Kangemi slum and a key informant from one of the government hospitals within Kangemi slum. Adults in the Kangemi slum area were the target population in this study rather than children because they have more freedom for their choices and are most probably more knowledgeable and exposed to issues regarding HIV.

Furthermore, the study only focused on ARV treatment for affected individuals. It did not include other forms of

treatment for HIV such as PrEP. This study was not narrowed down specifically to HIV infected individuals as it is a sensitive topic and there would most likely be reluctance from the individuals to share their true HIV status.

## 1.5. Significance of the study

The number of individuals suffering from HIV has been growing for many decades. In 2017, 36.9 million individuals around the world were living with HIV out of which only 59% of them were accessing ARV treatment ("Global Statistics"). HIV can sometimes be fatal if not treated early. The virus results in the weakening of the immune system, thus making the body more susceptible to diseases and infections ("Starting Antiretroviral Treatment for HIV"). According to UNAIDS data from 2017, approximately 25.7 million (69%) of the 36.9 million HIV positive individuals reside in Sub-Saharan Africa ("Global Statistics"). In Kenya, due to the lack of hygiene and certain cultural and sexual practices, HIV is most prevalent in slums and low-income areas (Madise et al.). These conditions increase the risks of transmitting and contracting HIV. ARV treatment helps lessen the viral load within the body of the affected individual ("Starting Antiretroviral Treatment for HIV"). The decrease in the amount of virus present in the body, decreases the number of T-cells being destroyed, and thus allows for the body's immune system to recover and become healthy and strong ("Starting Antiretroviral Treatment for HIV"). In addition, ARV's decreases the chance of transmitting HIV as fewer viruses are present within the body ("Starting Antiretroviral Treatment for HIV"). If treatment is effective enough, some HIV positive individuals may attain an undetectable viral load. This means that there is such a small amount of HIV present within the body that the virus has little impact on the individual's health and the individual has approximately a 0% chance of transmitting the virus ("Starting Antiretroviral Treatment for HIV"). However, this does not mean that the individual is cured as the amount of virus within the individual's body can spike up again ("Starting Antiretroviral Treatment for HIV"). Regardless, ARV's provide affected individual's to be able to live normal and healthier lives.

According to data from UNAIDS, in 2017, out of the 1.5 million HIV positive individuals in Kenya, 75% of the adults and 82% of the children were undergoing ARV treatment ("HIV and AIDS in Kenya"). This indicates that not everyone who is affected by HIV in Kenya is making use of ARV treatment despite its benefits. In addition, ARV treatment is especially necessary in poor income areas, such as slums, where risks of HIV are higher (Madise et al.). Kangemi is one of the biggest slums in Nairobi with over 100,000 individuals (Mynott).

In slums in Kenya, due to poor hygiene and certain cultural and sexual practices, the risks of HIV are higher than in non-slum areas (Madise et al.). Therefore, it is important to understand why people affected by this virus in slum areas, such as in the Kangemi slum in Nairobi, Kenya, have not sought ARV treatment as it is not only advantageous to the health of affected individuals, but it is also beneficial to society as it decreases the chances of further spreading HIV ("Starting Antiretroviral Treatment for HIV").

## 2. Literature Survey

This chapter centers on research that was previously conducted regarding HIV and ARV's from three distinct viewpoints: an extensive view of HIV and the usage of ARV's throughout the world, in Africa, and in Kenya and Kenya's informal settlements. Furthermore, this chapter covers current and past research and medical developments concerning treatments for HIV positive individuals. A conceptual framework relating independent and dependent variables for the study is also provided.

### 2.1 Worldview of HIV and ARV's

In 2017, approximately 36.9 million people throughout the world were suffering from HIV of which about 21.7 million were using ARV treatment ("Global HIV and AIDS Statistics – 2018 Fact Sheet"). Research conducted by UNAIDS shows that around 7000 women aged 15-24 are infected with HIV every week ("Global HIV and AIDS Statistics – 2018 Fact Sheet"). This is a relatively high number and thus, it is important for affected individuals to access proper treatment. Data has shown that from 2010 to 2017, there has been a rise in the number of HIV positive individuals who are using ARV treatment by approximately 8 million ("Global HIV and AIDS Statistics – 2018 Fact Sheet").

In Asia and the Pacific, the availability and accessibility of ARV's continues to be an issue thus increasing the chances of spreading HIV and negatively impacting the health of affected individuals. In 2013, nearly half the individuals that suited the requirements to receive ARV treatment were not on or accessing ARV treatment (*HIV in Asia and the Pacific: UNAIDS Report 2013* 8). The necessary requirements to receive ARV treatment differ in each country. Some countries have no requirements other than being HIV positive ("India to Provide HIV Treatment to All Who Need It"), while others require a certain T-cell count for individuals to be eligible for treatment (World Health Organization 77-78). In India, for example, any HIV positive individual is eligible for ARV treatment ("India to Provide HIV Treatment to All Who Need It").

In Europe, the number of individuals affected by HIV has continued to rise for many years despite efforts taken against it. From data from 2017, new HIV diagnoses in countries part of the European Union (EU) or countries part of the European Economic Area (EEA), were especially prevalent in males and individuals aged 30-39 (*HIV/AIDS surveillance in Europe 2018 – 2017 data* 38). The most common modes of transmission that resulted in HIV in these countries was sexual activity between men, heterosexual activity, and injecting drugs (*HIV/AIDS surveillance in Europe 2018 – 2017 data* 37-38). In Western and Central Europe, despite the widespread availability and accessibility of ARV's, many individuals continue to get late diagnoses (Kaplan 8). This is important as late diagnosis can be detrimental to the affected individual's health as AIDS related illnesses may develop thus making ARV treatment less helpful (Kaplan 9). In addition, late diagnosis means that the risks of spreading the infection are much higher which is harmful to public health. In Eastern Europe, 130,000 individuals were newly

diagnosed with HIV in 2017 ("Alarming' HIV Rates in Eastern Europe"). This was the highest number that had ever been recorded ("Alarming' HIV Rates in Eastern Europe"). 75% of the new infections accounted for in the WHO European region and 92% of the new infections in Eastern Europe, originated from the Russian Federation and Ukraine only ("Alarming' HIV Rates in Eastern Europe").

Ukraine has the second largest epidemic in Central Asia and Eastern Europe ("HIV and AIDS in Ukraine"). In 2017, there were about 240,000 individuals living with HIV in Ukraine out of which only 40% of the affected adults are on ARV treatment ("HIV and AIDS in Ukraine"). Many efforts have been taken in this region to ensure that ARV treatment is readily available and accessible for affected individuals. For instance, ARV's are available for all HIV positive individuals regardless of their T-cell count ("HIV and AIDS in Ukraine"). Nevertheless, only approximately 27% of HIV positive patients are virally suppressed ("HIV and AIDS in Ukraine"). Furthermore, the numbers of new HIV diagnoses are increasing thus causing many of the positive effects of ARV's to be diminished ("HIV and AIDS in Ukraine"). A study executed in Kiev, Ukraine, determined that the highest amount of HIV positive individuals were males aged 31-35, individuals who were involved in injecting drugs, and men who had sexual relations with other men (Simmons et al.). Injecting drugs has been the largest mode of transmission of HIV in Ukraine, accounting for 25% of the new diagnoses ("HIV and AIDS in Ukraine"). Additionally, several cases of HIV prevalence among sex workers in Ukraine have been associated with injecting drugs ("HIV and AIDS in Ukraine"). This further increases the chances of spreading HIV among clients of sex workers. About 1.8 million and 310,000 individuals are suffering from HIV in Latin America and in the Caribbean respectively ("HIV and AIDS in Latin America the Caribbean Regional Overview"). 58% of the affected adults in the Caribbean and 61% of the affected adults in Latin America are accessing ARV treatment ("HIV and AIDS in Latin America the Caribbean Regional Overview"). ARV coverage in these regions is progressing but still remains low with 61% coverage in Latin America and 57% coverage in the Caribbean in 2017 ("HIV and AIDS in Latin America the Caribbean Regional Overview"). Despite decent coverage, the Caribbean has the second highest HIV occurrence following sub-Saharan Africa as the rate of new HIV diagnoses has remained constant thus diminishing the benefits of ARV's ("HIV and AIDS in Latin America the Caribbean Regional Overview"). In addition, ARV treatment is not fully reaching key populations due to issues such as lack of education, stigma, and discrimination ("HIV and AIDS in Latin America the Caribbean Regional Overview"). Furthermore, certain individuals eventually stop using ARV treatment thus diminishing its effects ("HIV and AIDS in Latin America the Caribbean Regional Overview"). Majority of the new diagnoses in Latin America and in the Caribbean have been due to men who have had sexual relations with other men, partners of key populations who have engaged in sexual activity, and the remaining population (not including key populations) ("HIV and AIDS in Latin America the Caribbean Regional Overview"). Both Latin America and the Caribbean have opened treatment to all HIV positive individuals ("HIV and AIDS in Latin America the Caribbean

Regional Overview”). In 2017, 40% of the affected individuals were virally suppressed in the Caribbean and 52% were virally suppressed in Latin America (“HIV and AIDS in Latin America the Caribbean Regional Overview”). However, ARV coverage is not constant in all countries. Some countries have more HIV positive individuals accessing treatment and thus in some countries viral suppression is higher than in others (“HIV and AIDS in Latin America the Caribbean Regional Overview”).

In 2017, approximately one million people in Brazil were diagnosed to be HIV positive of which 64% of the affected adults are on ARV treatment (“HIV and AIDS in Brazil”). Several HIV awareness and HIV prevention programs have been administered within Brazil that have benefited the country. For example, due to many awareness and HIV testing programs, from 2015 to 2017, there was a 1% increase in the percentage of individuals that were aware of their status (“HIV and AIDS in Brazil”). However, despite several of these efforts, the rate of new infections remains high thus weakening the effects of the programs. New infections are most prominent within individuals aged 30 to 49 however, the rates of new infections have also risen in young males especially those who engage in same sex activities (“HIV and AIDS in Brazil”). Brazil, like many countries, has made ARV treatment available for all HIV positive individuals (“HIV and AIDS in Brazil”). In addition, the Brazil Ministry of Health was able to acquire the treatments for a lower price thus making it more affordable for poorer populations where HIV is more prevalent (“HIV and AIDS in Brazil”). Approximately 1.1 million people were living with HIV in the United States in 2015 (“HIV and AIDS in the United States of America (USA)”). They key populations most affected by HIV include men who engage in same sex activities, African Americans, and Latino/Hispanic people (“HIV and AIDS in the United States of America (USA)”). Data shows that new infections are greatest (10,000) between African American males who have same-sex intercourse (“HIV and AIDS in the United States of America (USA)”). Only 12% of the United States population is African Americans however, African Americans contributed to 43% of the new infections (“HIV and AIDS in the United States of America (USA)”). This percentage remains high despite the HIV diagnoses decreasing by 12% among African Americans (“HIV and AIDS in the United States of America (USA)”). New infections from Latino/Hispanic males who engage in same-sex activities have risen by 30% especially amongst individuals aged 25 to 34 and contribute to 26% of the newly infected individuals (“HIV and AIDS in the United States of America (USA)”). ARV treatment is being distributed and used amongst a large percentage of the population however, certain racial groups are not benefitting as well from the drugs as other (“HIV and AIDS in the United States of America (USA)”). A lower percentage of African American and Latino/Hispanic HIV positive individuals are accessing ARV’s despite being major contributors to new HIV infections (“HIV and AIDS in the United States of America (USA)”). Few individuals who do have access to treatment do not follow the regimen making the treatment less beneficial (“HIV and AIDS in the United States of America (USA)”). Canada had approximately 63,110 individuals living with HIV in 2016 (Challacombe).

The key populations are men who have sexual interactions with men, individuals who inject drugs, and heterosexual individuals (Challacombe). The number of HIV positive individuals and new diagnoses has increased in Canada since 2014 (Challacombe). Indigenous people, men, individuals who inject drugs, and individuals from countries with a high HIV risk factor, are main contributors to new diagnoses (Challacombe).

HIV has negatively impacted several countries; however, its effects have especially been prevalent in certain countries. India is the third most affected country by HIV with about 2.1 million people suffering from HIV in 2017 (“HIV and AIDS in India”). In addition, research shows that, in 2017, only 56% of HIV positive adults in India were on ARV treatment despite treatment being free (“HIV and AIDS in India”). This is due to the fact that affected individuals had difficulty accessing clinics (“HIV and AIDS in India”). In addition, HIV risks in India are increased due to stigma and discrimination, gender inequality, and poverty (“HIV and AIDS in India”). Low income communities are especially susceptible to the virus due to the lack of education, poor healthcare facilities, and unhygienic behavior and conditions within their community (“HIV and AIDS in India”). However, programs have risen in India to spread information about HIV and provide accessible treatment to individuals who test positive for HIV (“HIV and AIDS in India”). Despite these efforts, constraints continue to remain that affect the uptake of ARV’s such as stigma, discrimination, poor healthcare facilities, lack of support, inefficient comprehension and dissemination of information, lack of education, and HIV related depression (“HIV and AIDS in India”).

Two of the most common issues affecting the uptake of ARV’s throughout the world are stigma and discrimination. In several countries, initiatives have been taken to address and put an end to these issues; however, stigma and discrimination remain to be major concerns. Stigma is enhanced due to misinformation, laws, and fear (“HIV Stigma and Discrimination”). Misleading information and myths that have been made on HIV cause several individuals to view HIV positive patients in a negative light (“HIV Stigma and Discrimination”). In addition, governmental laws in certain countries have heightened stigma and discrimination against HIV positive patients (“HIV Stigma and Discrimination”). This is especially true for certain communities of people such as sex workers as well as the LGBTQ+ community (“HIV Stigma and Discrimination”). This results in fear within individuals suffering from HIV. Due to misconceptions about HIV, lack of support, governmental laws, and social stigma and discrimination, many people develop a strong fear of seeking treatment (“HIV Stigma and Discrimination”). This significantly impacts the affected individual as it is detrimental to their health and possibly fatal.

In Asia and the Pacific, some countries have enforced harsh laws which increase stigma about HIV and increases discrimination against HIV patients thus preventing individuals from having proper access to treatment and facilities (“HIV and AIDS in Asia and the Pacific Regional Overview”). For example, 18 countries in Asia and the

Pacific have laws against same sex activities resulting in discrimination against individuals within the LGBTQ+ communities when seeking treatment for HIV (“HIV and AIDS in Asia and the Pacific Regional Overview”). This is additionally true for sex workers. In Fiji, for instance, it was reported that approximately 59% of sex workers avoided treatment and healthcare services due to stigma and discrimination (“HIV and AIDS in Asia and the Pacific Regional Overview”).

In India, many misconceptions have surfaced about HIV that have increased stigma and discrimination within communities. For example, many believe that HIV only affects individuals that engage in same sex activities, are drug abusers, or are sex workers (Mothi et al. 20). In addition, certain social and cultural practices and gender inequality further exacerbate this issue (Mothi et al. 19-20). Men in poorer economic situations usually stay far away from their families for long periods of time for work (Mothi et al. 19). This usually causes them to engage in sexual activities with sex workers thus increasing their risk of contracting HIV and transmitting HIV to their significant other (Mothi et al. 19). Furthermore, women living in lower income areas in India have a higher risk of HIV due to gender inequality. Women have little or no voice within their families resulting in unsafe and unsanitary actions (Mothi et al. 20). Gender inequality increases stigma and discrimination as HIV positive women are usually blamed for infecting their families and are shamed by their community causing affected women to avoid seeking treatment (Mothi et al. 20). Initiatives have been taken to counteract the issue of stigma and discrimination such as the passing of the HIV/AIDS Act 2017, which made ARV treatment available for all HIV positive individuals, ensures confidentiality of individuals HIV related medical information, and punishes discriminatory acts against any HIV affected individuals (“Health Ministry Implements HIV/AIDS Act 2017: All You Need to Know: India News - Times of India”).

In Europe, stigma and discrimination continue to affect HIV positive individuals from seeking and accessing ARV treatment. A study conducted on 48 European countries in 2017 determined that approximately half of the countries surveyed thought that stigma and discrimination from the general population and healthcare workers proved to negatively affect men who have sexual relations with men, individuals who inject drugs, sex workers, and prisoners from seeking HIV prevention and testing facilities (*Impact of Stigma and Discrimination on Access to HIV Services in Europe 2*). However, less than half of the countries believed that stigma and discrimination affected HIV positive individuals in key populations from taking treatment (*Impact of Stigma and Discrimination on Access to HIV Services in Europe 2*). Furthermore, the study found that 65%, 62%, and 56% of the 48 countries believed that stigma and discrimination among key populations contribute to the problem of late diagnosis for men who have intercourse with men, those who inject drugs, and sex workers respectively (*Impact of Stigma and Discrimination on Access to HIV Services in Europe 3*). As in India, stigma and discrimination in Ukraine is heightened partially by misinformation. Many individuals have preconceived ideas about HIV and its

transmission, treatment, etc., which causes people to resent and disapprove of HIV positive individuals (Balakireva et al. 50). Approximately 37% of Ukrainians claimed that HIV positive patients should be isolated to prevent spreading the disease (Balakireva et al. 50). Only 25% Ukrainians were against this idea (Balakireva et al. 50). A survey done in 1999 (SEIFNALRPT) showed that around 39% of Ukrainians said that they would not spend money on prevention programs such as those that provide clean syringes for those who inject drugs and condoms for sex workers (Balakireva et al. 50). The majority of the population that supported such programs were young people as they usually engaged more in behaviors that increase their risk of contracting the virus (Balakireva et al. 50). In addition, stigma is increasing as the Ukrainian government is also attempting to implement the Russian gay anti-propaganda law that gives authorities the right to fine and possibly arrest individuals that are interested engage in activities that promote same-sex relationships (Vitek et al.). This significantly increases stigma and causes many to fear seeking treatment.

Furthermore, in Latin America and the Caribbean violence, gender inequality, stigma, and discrimination continue to be major problems affecting key populations from accessing testing and treatment facilities for HIV (“HIV and AIDS in Latin America the Caribbean Regional Overview”). Latin America and the Caribbean have the largest accounted degree of violence towards the LGBTQ+ community (“HIV and AIDS in Latin America the Caribbean Regional Overview”). Little or no legal attention has been given to transgender women who have been detained, tortured, and have become subjects of cruel treatment (“HIV and AIDS in Latin America the Caribbean Regional Overview”). Furthermore, police forces further heighten the situation by discriminating against transgender individuals therefore making it difficult for the country and the people to tame the violence (“HIV and AIDS in Latin America the Caribbean Regional Overview”). In addition, discriminatory behavior against transgender individuals usually forces them to become sex workers to earn a living (“HIV and AIDS in Latin America the Caribbean Regional Overview”). Sex workers face several forms of stigma and discrimination and violence (“HIV and AIDS in Latin America the Caribbean Regional Overview”). Most sex workers are given little educational/vocational opportunities, are rejected from healthcare facilities, and are harassed and attacked by the community around them (“HIV and AIDS in Latin America the Caribbean Regional Overview”). In Latin America and the Caribbean, those who are labeled as different are subject to violence and hate crimes. For example, in Latin American and Caribbean societies, women are meant to be submissive and men are meant to be masculine (“HIV and AIDS in Latin America the Caribbean Regional Overview”). Those who deviate from their roles are negatively viewed and are harshly treated (“HIV and AIDS in Latin America the Caribbean Regional Overview”). In these regions, stigma and discrimination against HIV positive individuals can be undergone in multiple ways such as being kicked out of the house, refused healthcare, and so on (“HIV and AIDS in Latin America the Caribbean Regional Overview”).

As in all countries, stigma and discrimination remain to be major issues limiting people from seeking testing and treatment services. Key populations are the largest targets of violence, stigma, and discrimination. In Brazil, despite the government's efforts to create laws that support the LGBTQ+ community such as legalizing gay marriage, the community continues to face violence and stigma ("HIV and AIDS in Brazil"). Sex workers face similar issues despite their occupation being legal in Brazil and nationally recognized as a career ("HIV and AIDS in Brazil"). Nevertheless, sex workers continue to be frowned upon by the nation and continue to be abused and violated, consequently increasing their risk of contracting HIV ("HIV and AIDS in Brazil"). Sex workers have advocated for laws to be instilled such that they can be protected and keep their rights. However, the government has not acted to conserve the rights of sex workers but rather have focused on limiting the spread of HIV among sex workers and their clients ("HIV and AIDS in Brazil"). Stigma and discrimination prevents key populations from seeking testing or treatment thus increasing the risk of spreading the virus. Despite some ignorance towards certain issues, the Brazil Ministry of Health has taken some efforts to end the issue of stigma and discrimination within the nation. In June 2014, the Brazil Ministry of Health issued a law that criminalized stigma and discrimination against HIV positive individuals (*The Brazilian Response to HIV and AIDS 7*). Furthermore, in December of 2014, the Ministry of Health issued a law claiming that an individual cannot be forced to be tested for HIV or to disclose their status (*The Brazilian Response to HIV and AIDS 7*). This was used to counter any discriminatory practices while HIV positive individuals were seeking employment (*The Brazilian Response to HIV and AIDS 7*). Regardless, mortality rates of HIV positive individuals remain relatively high in Brazil possibly due to the lack of testing, treatment, awareness, and late diagnosis (Guimarães et al. 187-189).

Stigma, discrimination, and lack of access and affordability of treatment and testing services are all major concerns that limit the issue of HIV from improving in North America ("HIV and AIDS in the United States of America (USA)"). As in South America, transgender individuals are mistreated, abused and discriminated against making them more vulnerable to contracting and spreading the disease in the United States ("HIV and AIDS in the United States of America (USA)"). Stigma amongst individuals in the U.S.A. have further been heightened by misleading information about HIV transmission ("HIV and AIDS in the United States of America (USA)"). The LGBTQ+ community has faced discrimination and stigma by peers, healthcare workers, and the public ("HIV and AIDS in the United States of America (USA)"). In 2017, it was reported that approximately 69.5% of LGBTQ+ individuals had been victims of discrimination ("HIV and AIDS in the United States of America (USA)"). Individuals, who are involved in drugs, increase their risk of contracting and spreading the disease. For example, drugs could further aggravate HIV and cause it to replicate in large numbers (Kapadia et al.). Furthermore, a cloudy mindset might cause individuals to not use protection during sexual intercourse and engage in risky behavior (Kapadia et al.).

In Canada, stigma and discrimination against HIV positive individuals remains as data from a study done in 2012 shows that 69% of Canadians claimed that HIV positive individuals may fear exposing their status and 55% claimed that they would face discrimination in other sectors of life ("HIV in Canada: A primer for service providers"). However, out of the people interviewed in the study, only approximately 7% of the individuals had high stigma and 22% of the individuals had moderate stigma against HIV positive individuals ("HIV in Canada: A primer for service providers"). In addition, stigma and discrimination are very harmful to the mental and physical health of HIV positive individuals (Pellowski et al.). People who fear and encounter stigma and discrimination usually fall into depression, develop anxiety, self-hate, and so on (Pellowski et al.). This tends to be true in key populations as they face extra discrimination for their sexuality, race, occupation, etc. This impacts efforts to counter HIV and its spread as people fear seeking treatment and testing services. Today, many HIV positive individuals remain unaware of their status making it more risky for them to spread the virus and to develop AIDS related diseases.

## 2.2 African View of HIV and ARV's

Eastern and Southern Africa are the regions that are most affected by HIV ("HIV and AIDS in Eastern and Southern Africa Regional Overview"). In 2017, 19.6 million individuals were living with HIV with 66% of adults and 59% children on ARV treatment ("HIV and AIDS in Eastern and Southern Africa Regional Overview"). Even though ARV coverage is increasing, a high amount of new HIV diagnoses continue to arise ("HIV and AIDS in Eastern and Southern Africa Regional Overview"). Young women, the LGBTQ+ community, sex workers, individuals who inject drugs, and prisoners are the most susceptible populations to HIV ("HIV and AIDS in Eastern and Southern Africa Regional Overview"). Nevertheless, 79% of the new infections are due to the population excluding sex workers, those who inject drugs, the LGBTQ+ community, and prisoners ("HIV and AIDS in Eastern and Southern Africa Regional Overview"). In Sub-Saharan Africa, due to the increased use of ARV treatment, the number of deaths due to AIDS has decreased by 39% from 2005 to 2013 (Kharsany and Karim). However, due to stigma related to gender roles, more women are accessing treatment than men as most men tend to avoid testing facilities and fail to regularly take treatment ("HIV and AIDS in Eastern and Southern Africa Regional Overview"). Subsequently, this has led to an increase in AIDS related diseases and an increase in mortality rates amongst men who contract HIV in Eastern and Southern Africa ("HIV and AIDS in Eastern and Southern Africa Regional Overview").

Throughout Africa, HIV related stigma, discrimination, and violence are major barriers to the effective uptake of ARV's and the use of HIV testing facilities. Due to misinformation, incorrect preconceived ideas about HIV, HIV positive patients, and/or religious ideals, many individuals develop physical, moral and social stigma against HIV positive individuals (Nweze et al. 250). In Sub-Saharan Africa especially, cultural beliefs regarding impurity, sexuality, and faith heighten stigma and discrimination within communities

("HIV and AIDS in Eastern and Southern Africa Regional Overview"). Studies conducted in Sub-Saharan Africa have shown that stigma and discrimination have caused HIV positive individuals to lose jobs and find difficulty when seeking employment, education, and healthcare (Nweze et al. 250). Furthermore, discrimination has also been exemplified within families and religious places (Nweze et al. 250). Some families tend to become ashamed of the HIV positive status of their family member (Nweze et al. 250). Therefore, this leads to families taking large measures to conceal the status of the individual thus preventing them from seeking testing and treatment. (Nweze et al. 250). In addition, often, communities and families become hostile towards HIV positive individuals causing them to be ashamed of their status and themselves thus making them less likely to seek help ("HIV and AIDS in Eastern and Southern Africa Regional Overview"). In Sub-Saharan Africa, groups that have a high risk of contracting HIV (LGBTQ+ community, individuals who inject drugs, and sex workers) are the most unlikely to seek HIV testing and treatment services due to discrimination (Kharsany and Karim).

Globally, South Africa has the largest HIV epidemic with 7.2 million people living with HIV ("HIV and AIDS in South Africa"). Approximately 61% of HIV positive adults are utilizing ARV's ("HIV and AIDS in South Africa"). The main groups affected by HIV include sex workers, transgender women, men who engage in sexual activities with men, individuals who inject drugs, children/orphans, women, and young girls ("HIV and AIDS in South Africa"). In South Africa, sex workers have the highest rate of HIV prevalence approximated at 57.7% ("HIV and AIDS in South Africa"). The risk for sex workers remains high due to lack of employment opportunities, poverty, lack of education on HIV, and drug use using injections ("HIV and AIDS in South Africa"). Furthermore, children and orphans are also at a high risk of HIV ("HIV and AIDS in South Africa"). This is partly due to mother to child transmission and social and economic related issues ("HIV and AIDS in South Africa"). Orphans are especially susceptible to HIV as they participate in sexual activities out of force, for money or a support system, and for pleasure at an early age ("HIV and AIDS in South Africa"). Young women are highly vulnerable to HIV. In relation to young men, HIV prevalence among young women is four times greater ("HIV and AIDS in South Africa"). This has been related to poverty, gender-inequality, violence, and relationships with older men ("HIV and AIDS in South Africa"). South Africa has taken extreme initiatives to increase ARV coverage and provide ARV treatment in all sectors of the country ("HIV and AIDS in South Africa"). Currently, South Africa has the largest ARV treatment program throughout the world ("HIV and AIDS in South Africa"). It has adopted the 'test and treat' method which provides treatment to all individuals who test positive for HIV ("HIV and AIDS in South Africa"). However, late diagnoses continue to occur thus increasing chances and rates of mortality due to AIDS related illnesses or other infections ("HIV and AIDS in South Africa").

HIV positive individuals face stigma, discrimination, and violence from their community and healthcare workers in

South Africa. Sex workers are currently viewed as criminals in South Africa and can even be condemned for possessing condoms thus increasing the risk and chances of unsafe sex ("HIV and AIDS in South Africa"). In addition, HIV treatment and testing services are having difficulty reaching sex workers as authoritative forces harass and abuse sex workers ("HIV and AIDS in South Africa"). Similarly, the LGBTQ+ communities are subject to high amounts of violence from the police, healthcare workers, as well as people against LGBTQ+ individuals due to cultural and traditional ideals ("HIV and AIDS in South Africa"). This continues to occur despite government programs and laws to reduce stigma and protect the human rights of LGBTQ+ individuals ("HIV and AIDS in South Africa"). Additionally, young women face violence, such as rape, that has increased their risk of contracting HIV ("HIV and AIDS in South Africa"). In South Africa the rate of rape is high with 2070 accounted incidents of rape per 100,000 individuals of women aged 17-48 (Muula).

HIV prevalence is highest in Eastern and Southern Africa ("HIV and AIDS in Eastern and Southern Africa Regional Overview"). In 2017, HIV prevalence amongst individuals aged 15 to 49 was highest with 27.4% in Eswatini ("HIV and AIDS in Eswatini"). This was followed by Lesotho with 23.8% ("HIV and AIDS in Lesotho") and Botswana with 22.8% HIV prevalence (ages 15-49) ("HIV and AIDS in Botswana"). ARV's are free in Eswatini though there is a disparity between the percentage of men and the percentage of women testing for HIV, getting treated for HIV, and that are virally suppressed ("HIV and AIDS in Eswatini"). Less men are likely to seek testing and treatment compared to women. For instance, in 2016, 77% of women were on treatment compared to 68.7% of men ("HIV and AIDS in Eswatini"). Therefore, HIV testing and treatment programs have begun to target men. Similarly in Lesotho, in 2016, 60% of women were on treatment compared to 43% of men ("HIV and AIDS in Lesotho"). Furthermore, a study done in Lesotho determined that 70.5% of women were virally suppressed compared to 63.4% of men aged 15 to 59 years old ("HIV and AIDS in Lesotho"). In addition, Lesotho was the first country in Africa to make ARV treatment available to any individual who tested positive for HIV commonly known as 'test and treat' ("HIV and AIDS in Lesotho"). Botswana also implemented the 'test and treat' method for all its citizens ("HIV and AIDS in Botswana"). Additionally, Botswana's ARV treatment program has done exceptionally well except for some remaining concerns regarding the number of individuals who test positive but do not seek treatment or do not properly follow their treatment regimen ("HIV and AIDS in Botswana").

### 2.3 HIV and ARV's in Kenya and in Kenyan Informal Settlements

About 1.5 million people were living with HIV in Kenya in 2017 out of which 75% were on ARV treatment ("HIV and AIDS in Kenya"). Sex workers, men who have sexual relations with men, individuals who inject drugs, young individuals, and women are the populations most affected by HIV in Kenya ("HIV and AIDS in Kenya"). However, sex workers take precautions to protect themselves and engage in less risky behaviors compared to other groups of people

that are highly susceptible to HIV (“HIV and AIDS in Kenya”). Prevalence of HIV among men who engage in sexual activities with other men is three times that of the general population (“HIV and AIDS in Kenya”). Furthermore, adolescents contribute to more than half of the new infections with young women being twice as susceptible to the virus compared to young men (“HIV and AIDS in Kenya”). Kenya has adopted the ‘test and treat’ method (“HIV and AIDS in Kenya”). This ensures that any individual who tests positive for HIV is eligible for treatment. ARV coverage is especially low among key populations such as sex workers and the LGBTQ+ community (“HIV and AIDS in Kenya”). However, in 2015, approximately 51% of all individuals suffering from HIV were virally suppressed (“HIV and AIDS in Kenya”). Furthermore, there has been improvement in the percentage of individuals that maintained and continued their treatment after twelve months from 70% in 2013 to 81% in 2015 (“HIV and AIDS in Kenya”).

Stigma and discrimination in Kenya continue to be major problems preventing individuals from seeking testing and treatment services. Therefore, the risk of spreading the virus and contracting AIDS related diseases and illnesses in this region remains high. In Kenya, sex workers are victims of rape and are subject to violence by authoritative forces (“HIV and AIDS in Kenya”). A study conducted in 2015 determined that all sex workers who were raped did not report the abuse to authorities in fear of being indicted for their job (“HIV and AIDS in Kenya”). Likewise, in 2013 a report was made to the Committee Against Torture against authoritative forces claiming that the LGBTQ+ community are victims of harassment, threats, blackmail, and violence (“HIV and AIDS in Kenya”). Furthermore, stigma against the LGBTQ+ community remains high as homosexuality is not well accepted and remains illegal within Kenya (“HIV and AIDS in Kenya”). Women are highly vulnerable to HIV as a result of gender inequality and sexual violence (“HIV and AIDS in Kenya”). In different parts of Kenya, women are often denied healthcare, education, and employment opportunities (“HIV and AIDS in Kenya”). Therefore, men tend to dominate women in relationships leading to riskier practices that increase women’s vulnerability for contracting HIV (“HIV and AIDS in Kenya”). In 2008, data collected shows that 48% of men and 33% of women accepted individuals living with HIV (“HIV and AIDS in Kenya”). These percentages have decreased throughout the years as 2014 data showed that 44% of men and 26% of women accepted individuals living with HIV (“HIV and AIDS in Kenya”). It is necessary to minimize stigma as it affects individual’s adherence to their treatment thus increasing the risk of mortality and spreading the virus. Furthermore, it is important to ensure that individuals do not succumb to stigma and seek testing and treatment for HIV as it is important for their mental, physical, and emotional health (*Guidelines on Use of Antiretroviral Drugs for Treating and Preventing HIV in Kenya* 58).

Individuals living in slum areas are at a higher risk of HIV than those living in non-slum areas (Madise et al.). Poverty, poor healthcare facilities, unsanitary environments, and unemployment are major issues that affect and increase the vulnerability of slum dwellers to HIV (Madise et al.). This

results in less individuals seeking healthcare and high mortality rates compared to non-slum areas (Madise et al.). In addition, individuals in slum areas tend to engage in riskier behaviors such as having sexual relations with many partners and avoiding the use of condoms (Madise et al.). Furthermore, certain ethnic groups are at a higher risk of HIV than others. For example, Kenya is made up of different tribes and ethnic groups. A study found that the Luo ethnic group engage in risky behaviors such as tattoos, piercings, widow inheritance, low rates of male circumcision, and widow cleansing where a widow engages in sexual actions to cleanse herself (Madise et al.).

Kibera is the biggest slum in Kenya yet the government provides little aid to the slum dwellers (Patterson et al. 9). Sewage flows through the slums and garbage lies throughout their streets (Patterson et al. 9). These conditions are ideal for diseases such as cholera and typhoid. Since, HIV affects the immune system of an individual, HIV positive individuals are more susceptible to AIDS related infections and other diseases. Therefore, the uncleanness of the slum coupled with risky behaviors such as high alcohol consumption, injecting drug use, and unprotected sex, make slum dwellers highly vulnerable to HIV and increase the risk and chance of contracting fatal illnesses (Patterson et al. 10). Hence, it is important that HIV positive individuals in slum areas access treatment and testing facilities rapidly. Nevertheless, despite ARV treatment being free, misinformation and cultural and religious beliefs prove to be barriers that prevent individuals from seeking testing and treatment for HIV (Patterson et al. 11). Some HIV positive individuals are misinformed about ARV’s thus fearing the side effects of the medication, fear of exposure of their status, religious ideals that conflict with information given by healthcare workers, and the inability of patients to understand information provided by healthcare workers (Patterson et al. 11-12). Furthermore, many individuals do begin ARV treatment but do not regularly take treatment and follow the treatment regimen thus diminishing its effects (Patterson et al. 12).

## 2.4 Conceptual Framework

The following conceptual framework depicts the relationship between dependent and independent variables for the study.

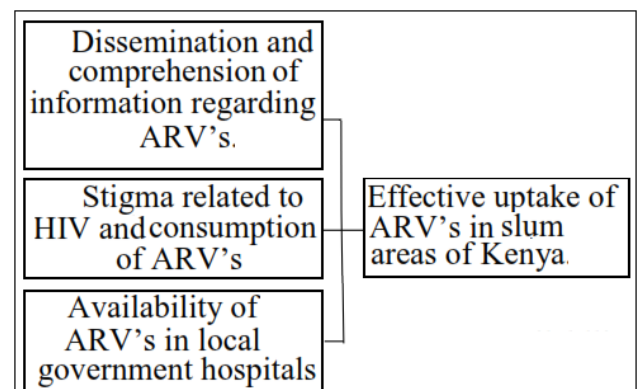


Figure 2.5: Conceptual Framework



### 3. Research Methodology

This chapter describes the methods that were used to collect data for the research. It contains the research design, population and sample size, sampling design, sample selection, data type and collection, data analysis, and the ethical considerations.

#### 3.1 Research Design

A research design is an outline of how the research will be conducted in an organized and efficient manner ("Research Guides: Organizing Your Social Sciences Research Paper: Types of Research Designs"). Furthermore, it describes the methods and tools that will be used in data collection and analysis such that the research problem and objectives are efficiently addressed ("Research Guides: Organizing Your Social Sciences Research Paper: Types of Research Designs"). There are different ways in which a research can be conducted. This research used a method called descriptive research. "Descriptive research is used to obtain information concerning the current status of the phenomena and to describe "what exists" with respect to variables or conditions in a situation" ("Research Guides: Organizing Your Social Sciences Research Paper: Types of Research Designs").

This research partially relied on primary data collected from the phenomena under study. During data collection, respondents were allowed to share their views and opinions relating to the topic of study when responding to open-ended questions. Part of the data used in the study originated from secondary sources such as government hospitals and websites. The secondary data was correlated with primary data obtained from Kangemi residents. Part of the primary data was analyzed quantitatively as some of the questions were closed-ended. This implies that both qualitative and quantitative techniques were employed in this research.

#### 3.2 Population and Sample Size

A population is a group of people, objects, and/or animals that share at least one similar characteristic ("Statistical Language- What is a Population?"). A sample is a section/ piece of the population. Statistical research commonly uses samples instead of populations when collecting data. This is due to the fact that populations are usually large thus making it difficult and sometimes impossible to collect data from every individual, object, and/or animal within the population. Data from samples can be used to draw generally accurate conclusions that can describe the entire population. For data from samples to provide accurate conclusions however, it is important that a large enough sample size is chosen with no bias (National Research Council 10). Furthermore, it is important the sample size is an odd number as it ensures that all answers must have a popular and an unpopular opinion. This research targeted two populations: adult residents in Kangemi and a key informant at Kangemi Health Center. There were two different surveys; one survey was provided to adult residents of Kangemi and the other to a key informant at Kangemi Health Center. 101 respondents were chosen at random throughout Kangemi to fill the questionnaire. Kangemi has approximately 100,000 residents and 101 respondents is a

realistic sample based on constraints such as time, geographical size of Kangemi, and budget (Adler and Adler).

#### 3.3 Sampling Design

Questionnaires were distributed to the sample of 101 Kangemi residents. Sample surveys are more favorable when conducting a research as the surveys are easier to collect and analyze compared to an entire population survey commonly known as a census (National Research Council 10). This research used a simple random sample (SRS) of 101 individuals in Kangemi. In a simple random sample, each subset of a certain size from the population has an equal chance of being selected (National Research Council 11). The data collected for this research used this method as the 101 respondents were from each of the different locations within Kangemi slum. The data was collected from adults (18+) that were residents of Kangemi. This ensured that the data collected would be unbiased and could be used to represent the entire adult, resident population of Kangemi. There are only two government hospitals in the Kangemi slum area. One government hospital was randomly chosen and the head of the HIV department was contacted to complete the key informant survey.

#### 3.4 Sample Selection

The information collected and analyzed for this research from the Kangemi residents was partially primary data. Primary data is firsthand data that has not been collected and taken through another source. Primary data allows responses regarding the research problem to be directly received from the target population thus allowing valid conclusions to be made. This research mainly targeted adults who were residents of Kangemi slum and a key informant at a local government hospital. The research chose not to focus on HIV positive individuals as many individuals may fear sharing and disclosing their status. In addition, adults were primarily targeted as according to 2017 data, less adults were accessing ARV treatment compared to children in Kenya ("HIV and AIDS in Kenya"). The data enumerator ensured that the respondents were adults and residents of Kangemi before filling out the questionnaire. The data collected from Kangemi Health Center, a local government hospital, consisted of both primary and secondary data from the key informant.

#### 3.5 Data Type and Collection

The data was collected using questionnaires for both populations. The questionnaires contained both closed ended and open ended questions that were well-phrased to avoid confusion and misleading responses. The open ended questions provided room for the respondent to share other responses that the researcher might not have included or was unaware of. This prevented the respondent from answering questions with responses that did not capture their own opinion. The key informant at the local government hospital filled out a separate questionnaire to provide factual data about HIV and ARV's at Kangemi Health Center. This data provided knowledge and data from the government hospital

that could be correlated with data that was obtained from the Kangemi residents.

**3.6 Data Analysis**

The data was analyzed using IBM SPSS v.25.0. Quantitative data was directly inputted into the software while qualitative data was translated quantitatively before being inputted for analysis. After analysis, the data was presented using bar graphs, pie charts, and tables.

**3.7 Ethical Considerations**

According to Ellsberg and Heise, “Research designs should consider issues of confidentiality, problems of disclosure, and the need to ensure adequate and informed consent” (Ellsberg and Heise). During data collection, confidentiality was guaranteed. The data enumerator was also courteous and accorded every respondent due respect. All respondents were adults and were ensured to be of legal age. None of the respondents were forced or coerced into responding to the questionnaire. Furthermore, none of the respondents were seemingly under the influence of alcohol. In addition, as English is not the primary language spoken in Kangemi, the data enumerator translated the questionnaire to Kiswahili

such that each respondent clearly understood each question. This strengthened the validity of the data collected.

**4. Empirical Results**

This chapter consists of visual representations and descriptions of the data that was derived from a questionnaire responded to by residents of Kangemi slum. The data has been displayed using tables, charts, and graphs generated using the SPSS program.

**4.1 Age of Respondents**

The highest numbers of respondents at 30.69% were aged between 18 and 25 years with the lowest percentage being that of respondents aged 50 and above. The rest of the age brackets followed a descending pattern as age increased. Figure 4.2 below demonstrates this information.

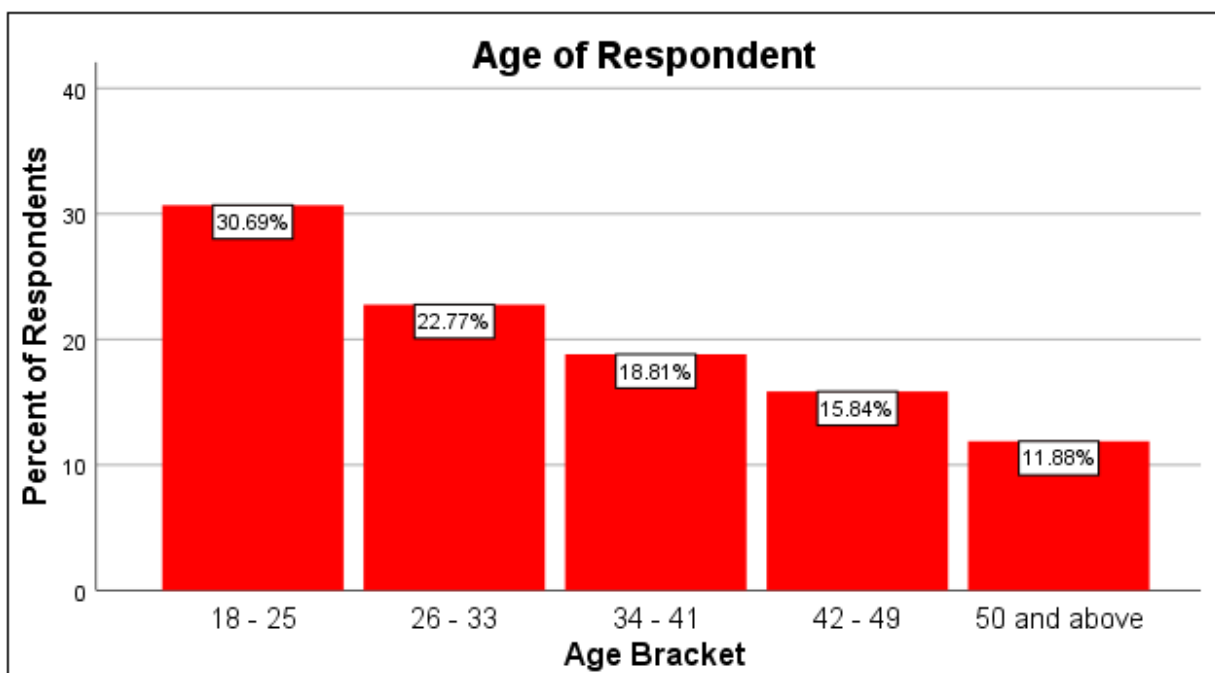


Figure 4.2 Age of Respondent

**4.2 Awareness of ARV Drugs in Kangemi**

All respondents were aware of ARV drugs for HIV treatment. When they were asked whether they have ever heard of the ARVs, they were expected to state YES or NO but all responded with yes, resulting to 100% of the respondents being aware of the ARVs.

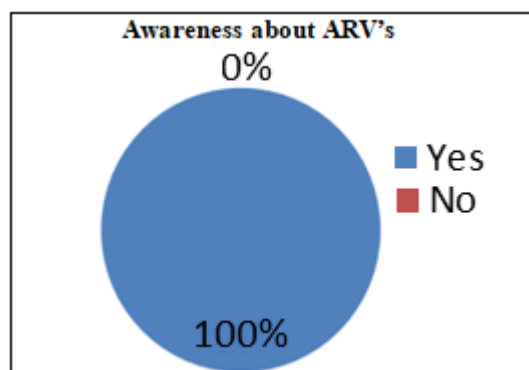


Figure 4.3: Awareness about ARVs

**4.3 Education Level of Respondents**

respondents who were educated decreased as the level of education increased. Figure 4.4 below captures this data.

The highest education level attained by majority of the respondents (49.50%) was primary school while only 1.98% of the respondents were uneducated. The percentage of

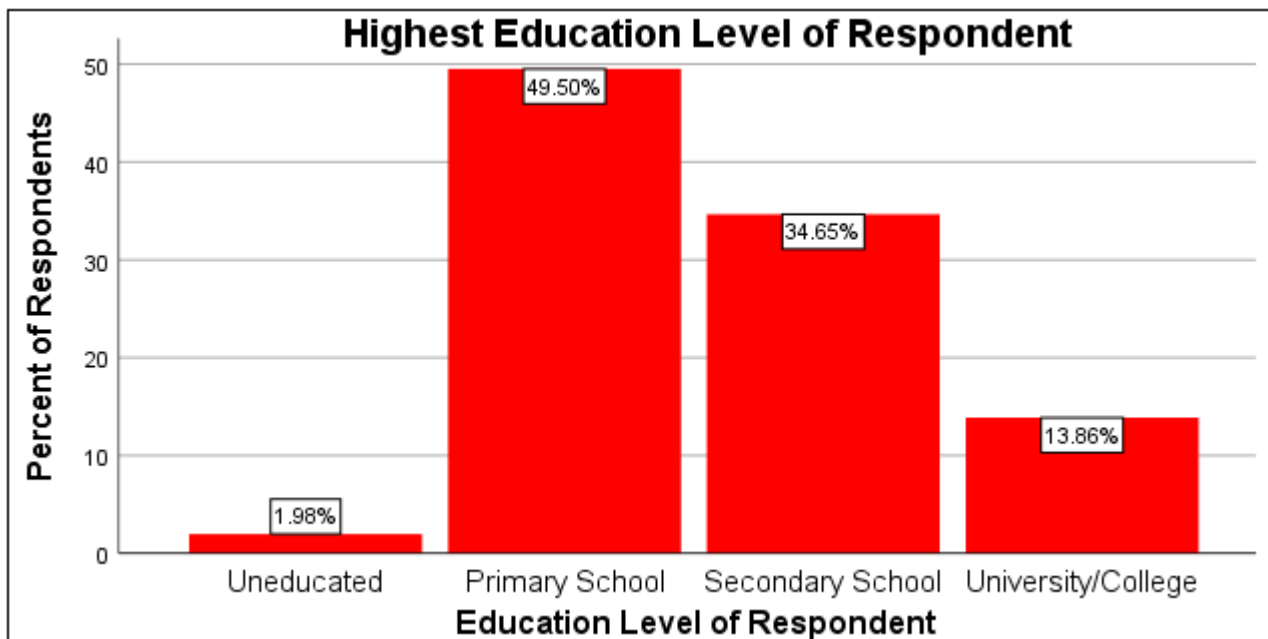


Figure 4.4: Education Level

**4.4 Source of Knowledge about ARV Drugs**

individual. However, none of the respondents found out about ARV's from local government hospitals in Kangemi. Figure 4.5 displays this information.

Majority of the respondents (54.46%) gained knowledge about ARV drugs from family members and/or friends. 8.91% learned about ARV's from an HIV positive

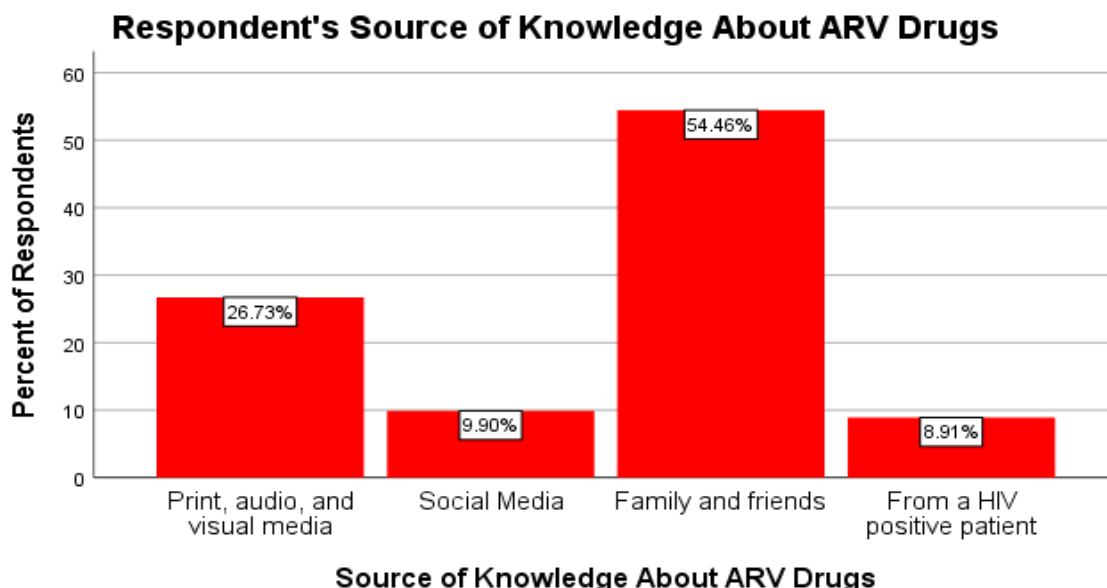


Figure 4.5: Source of Knowledge about ARV Drugs

**4.5 Preconceptions about ARV Drugs**

from infecting others. None of the respondents claimed that ARV drugs were a cure for HIV. Figure 4.6 shows this data.

About 90.10% of the respondents viewed ARV's as drugs that lengthen the lifespan of HIV patients and lessen the chances of spreading the infection. 9.90% of the respondents thought that ARV's completely prevent an infected person

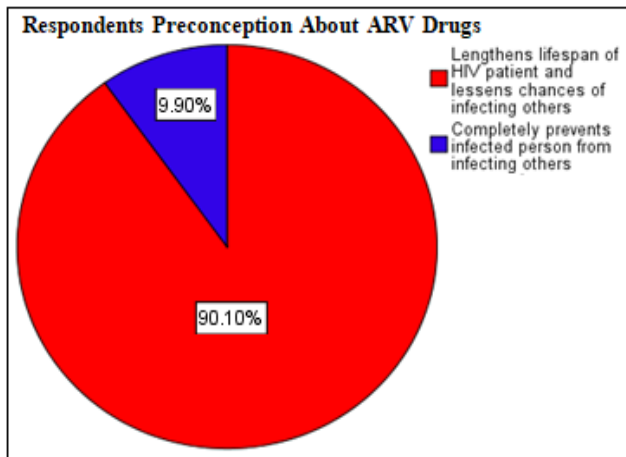


Figure 4.6: Preconceptions about ARV Drugs

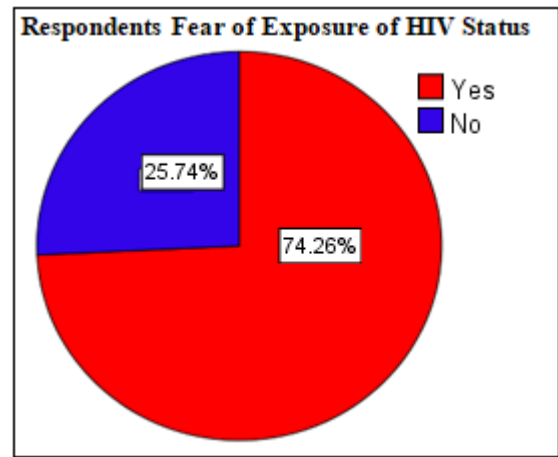


Figure 4.8: Fear of Exposure of HIV Status

#### 4.6 Respondent's Willingness to Voluntarily be Tested for HIV

A little more than half of the respondents said that they would willingly be tested for HIV. On the other hand, 47.52% of the respondent's claimed that they would not freely go get tested for HIV. Figure 4.7 demonstrates this data.

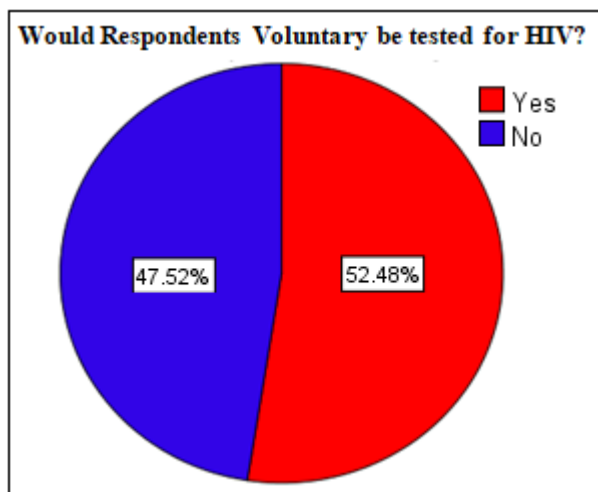


Figure 4.7: Voluntary Testing for HIV

#### 4.7 Respondents Fear of Exposure of HIV Status if Tested Positive

74.26% of respondents claimed that they would fear having their status known if they were HIV positive. Only about one fourth of the respondents said that they would not be mind having their status exposed if they were HIV positive. Figure 4.8 displays this data.

#### 4.8 Willingness to Seek ARV Treatment of HIV Positive

Majority of the respondents (92.08%) said that they would willingly seek ARV treatment if they tested positive for HIV. 7.92% of respondents said that they would still not seek ARV treatment even if they were tested positive for HIV. Figure 4.9 captures this data.

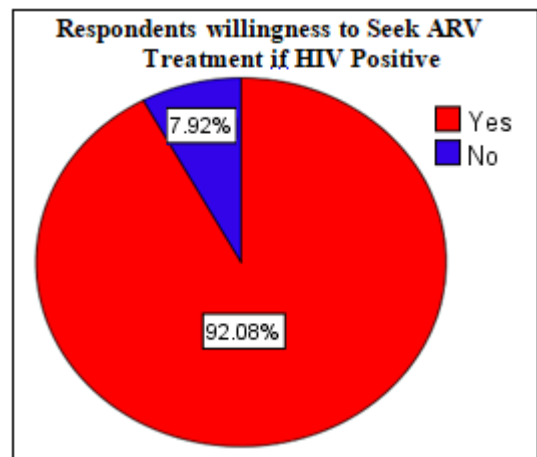


Figure 4.9: Willingness to Seek ARV Treatment

#### 4.9 Beliefs about HIV

Figure 4.10 shows that 83.17% of the respondents believed that HIV was just a disease like any other disease. On the other hand, 10.98% of the respondents believed that HIV was a religious curse and 5.94% of the respondents believed that HIV was a cultural cures associated with African traditional societies. Figure 4.10 shows this data.

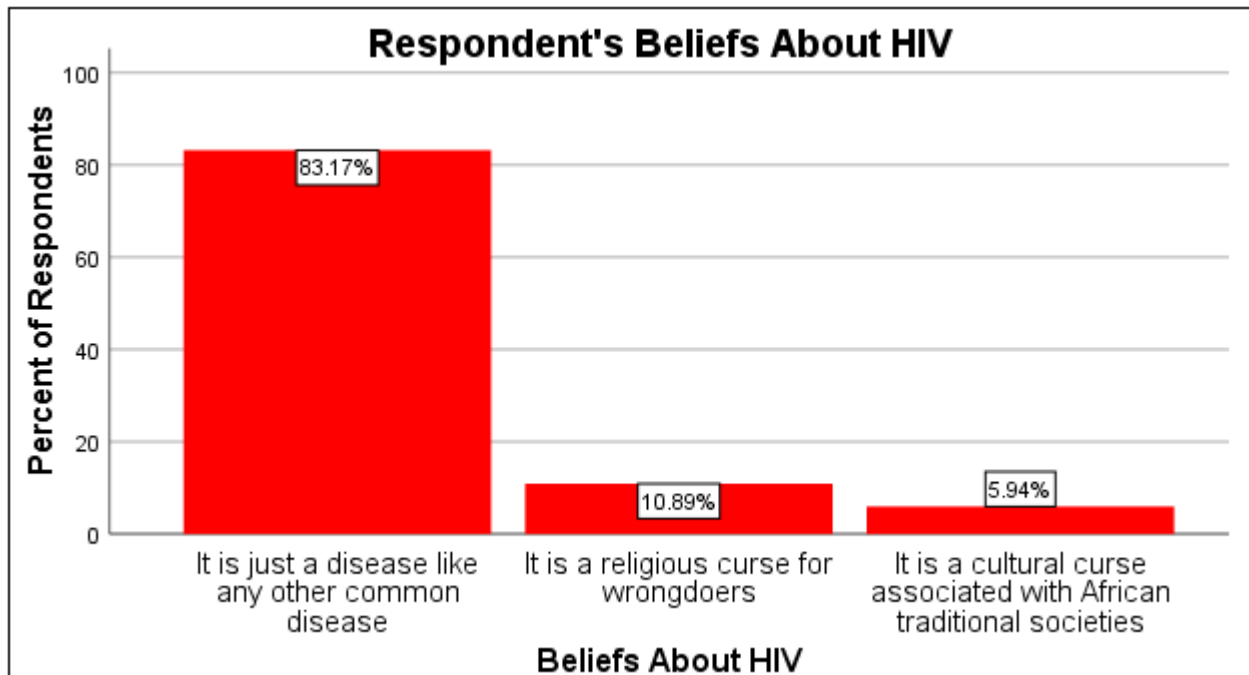


Figure 4.10: Beliefs about HIV

**4.10 Kangemi Resident's Knowledge of Availability of ARV's in Local Government Hospitals**

According to table 4.11, 80.20% of respondents did not know whether ARV drugs were available in their local government hospitals. Only 19.80% of respondents knew that ARV drugs were available in their local government hospitals. Figure 4.11 demonstrates this data.

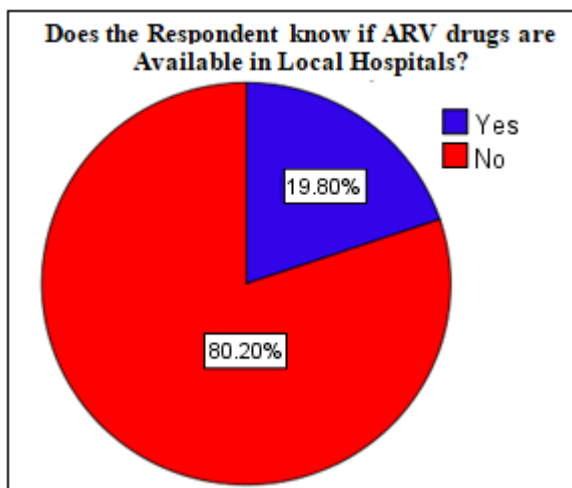


Figure 4.11: Knowledge of Availability of ARV's

**4.11 Respondent's Knowledge of Cost of ARV's**

Most of the respondents (84.16%) of individuals knew that ARV's were free. 15.84% did not know what the cost of ARV's are. Figure 4.12 displays this data.

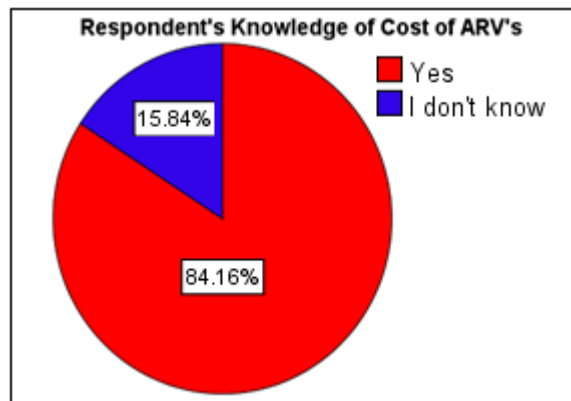


Figure 4.12: Knowledge of Cost of ARV's

**4.12 Correlation Analysis of Source of Information about ARV's and Preconceptions about ARV Drugs**

**Table 4.13:** Correlation Analysis of Source of Information about ARV's and Preconceptions about ARV Drugs

Model Summary				
Model	R	R Square	Adjusted R Square	Std. error of the Estimate
1	.019 <sup>a</sup>	.000	-.010	.302

a. Predictors: (Constant), Respondent's source of knowledge about ARV drugs

From Table 4.13, the adjusted R square value is 0.000%, which does not demonstrate a linear relationship. Therefore, the variance in the respondent's preconceptions about ARV drugs is not clearly explained by the respondent's source of information.

**4.13 Correlation Analysis of Level of Education and Preconception about ARV Drugs**

**Table 4.14:** Correlation Analysis of Level of Education and Preconception about ARV Drugs

Model Summary				
Model	R	R Square	Adjusted R Square	Std. error of the Estimate
1	.313 <sup>a</sup>	.098	.089	.287
a. Predictors: (Constant), Highest Education Level of Respondent's				

8.9% of the variability in the respondent's preconception about ARV drugs is explained by the respondent's level of education. This value is relatively low, indicating that there is a weak linear relationship between the two variables.

**4.14 Correlation Analysis of Age and Willingness of Respondent to voluntarily be tested for HIV**

**Table 4.15:** Correlation Analysis of Age and Willingness of Respondent to Voluntarily be Tested for HIV

Model Summary				
Model	R	R Square	Adjusted R Square	Std. error of the Estimate
1	.251 <sup>a</sup>	.063	.053	.488
a. Predictors: (Constant), Age of Respondent's				

Table 4.15 shows that 5.3% of the variability in the respondent's willingness to voluntarily be tested for HIV is explained by the respondent's age. This percentage isn't large enough to suggest a linear relationship between these two variables.

**4.15. Correlation Analysis of Level of Education and Willingness of Respondent to voluntarily be tested for HIV**

**Table 4.16:** Correlation Analysis of Level of Education and Willingness of Respondent to voluntarily be tested for HIV

Model Summary				
Model	R	R Square	Adjusted R Square	Std. error of the Estimate
1	.505 <sup>a</sup>	.255	.247	.435
a. Predictors: (Constant), Highest Education Level of Respondent's				

From table 4.16, the value of the adjusted R square is 0.247. This indicates that 24.7% of the variability in the willingness of the respondent to voluntarily be tested for HIV is explained by the respondent's level of education. The linear relationship between the two variables is significant but relatively weak.

**4.16 Correlation Analysis of Age and Beliefs about HIV**

**Table 4.17:** Correlation Analysis of Age and Beliefs about HIV

Model Summary				
Model	R	R Square	Adjusted R Square	Std. error of the Estimate
1	.481 <sup>a</sup>	.231	.223	.481
a. Predictors: (Constant), Age of Respondent's				

Table 4.17 indicated that 22.3% of the variability in beliefs about HIV can be explained by the age of the respondent.

This demonstrates a weak linear but important relationship between the two variables.

**4.17 Correlation Analysis of Level of Education and Beliefs about HIV**

**Table 4.18:** Correlation Analysis of Level of Education and Beliefs about HIV

Model Summary				
Model	R	R Square	Adjusted R Square	Std. error of the Estimate
1	.0364 <sup>a</sup>	.133	.124	.511
a. Predictors: (Constant), Highest Education Level of Respondent's				

The value of the adjusted R squared relating level of education and beliefs about HIV are 0.124. This demonstrates that 12.4% of the variability in the beliefs about HIV can be explained by the level of education. This is a fairly low percentage. Therefore, these two variables have a weak linear relationship that is nevertheless significant.

**4.18 Correlation Analysis of Source of Information and Knowledge about the Cost of ARV Drugs**

**Table 4.19:** Correlation Analysis of Source of Information and Knowledge about the Cost of ARV Drugs

Model Summary				
Model	R	R Square	Adjusted R Square	Std. error of the Estimate
1	.036 <sup>a</sup>	.001	-.009	.737
a. Predictors: (Constant), Respondent's source of knowledge about ARV drugs				

The adjusted R square of the relationship between source of information and knowledge about the cost of ARV drugs is extremely low with a negative value. This indicates that there is no linear relationship between the two variables.

**4.19 Key Informant Information**

Kangemi Health Centre provided factual data about HIV testing and ARV uptake within the institution. From the data, the institution had three main ways of disseminating information about ARV drugs to Kangemi residents: posters and fliers, health talks within the government hospital, and community outreaches. On average, 1200 seek HIV testing at the facility every month with 80% of the HIV positive patients seeking ARV treatment. Additionally, the key informant confirmed that the facility receives a constant supply of ARV's.

**5. Discussion, Conclusions, and Recommendations**

This chapter discusses the outcomes of the primary data collected and correlates it with both primary and secondary data obtained from residents of Kangemi and a key informant from Kangemi Health Center. It further draws conclusions based on these discussions. Finally, advisory recommendations are made to policy makers and other interested parties.

## 5.1 Discussion

Majority of the respondents were aged between 18-33 years. Thus, the data highly reflects the viewpoint of young adults regarding HIV and ARV's in Kangemi. Approximately half of the respondents had attained a primary level of education which suggests that standards of education within Kangemi slum are relatively low. Awareness of ARV drugs does not pose as an issue to residents of Kangemi slum since all respondents were aware of the existence of ARV drugs. The respondents primarily acquired knowledge about ARV drugs from family members and/or friends. Media was the second highest source of information about ARV drugs. Few of the respondents had attained this information from an HIV positive patient. None of the respondents learned about ARV drugs from local government hospitals. Family and friends appear to be the most efficient disseminators of information regarding ARV drugs. Majority of the respondents (90.10%) knew that ARV drugs lengthen an affected individual's lifespan and reduces chances of cross infections. Few respondents had the misconception that ARV's completely prevent infected persons from infecting others. Regardless, every respondent knew that HIV is incurable.

The data given by respondents on their willingness to voluntarily be tested for HIV was roughly split in half with 52.48% saying they would seek testing and 47.52% saying they would not. Nevertheless, there was a general fear of exposure of HIV status by majority of the respondents. Despite this, very few of the respondents claimed that they would not seek ARV treatment if they tested positive for HIV.

Regardless of majority of the respondents fearing exposure of their HIV status, their fear was not affiliated with religious and/or cultural beliefs as majority of the respondents knew that HIV is a disease like any other. 16.83% of the respondents viewed HIV as a curse associated with religion or African cultures. In addition, a large number of the respondents had no knowledge of the availability of ARV drugs in their local government hospitals. However, majority of the respondents knew that ARV's were free.

There was no relationship between source of information and preconceptions about ARV drugs. The correlation analysis of level of education and preconception about ARV drugs demonstrates there is a weak relationship between the education level of the Kangemi residents and their preconceptions about ARV drugs. Though very small, there is a relationship between the age and willingness of the respondent to be tested voluntarily for HIV. 70% of the respondents aged 42 and above were unwilling to be tested. There was a slight relationship between the level of education and the willingness of the respondent to voluntarily be tested. All of the respondents who attained a tertiary level of education were willing to be tested for HIV voluntarily. The correlation analysis shows a weak but relatively significant relationship between age and beliefs about HIV. However, among the respondents who had cultural and religious beliefs about HIV, 76.47% of individuals were aged 42 and above. Furthermore, the level of education had minimal effect on the beliefs about HIV.

Majority of the individuals knew about the cost of ARV drugs regardless of the respondent's source of information.

## 5.2 Conclusions

None of the respondents had stated that they had found out about ARV's from their local government hospitals. Data from Kangemi Health Center showed that the institution had methods of disseminating information to the residents of Kangemi. These methods include the use of posters and fliers, health talks within the government hospital, and community outreaches. This is a contradiction hence we can conclude that the methods of dissemination employed by the hospital are not effective. Furthermore this indicates that the methods of advertisement about HIV and ARVs employed by the government are not very effective as more than half of the respondent's relied on family and friends for this information.

The methods through which most of the respondents acquired knowledge about ARV drugs were effective in clearly communicating the role of ARV's as only very few of the individuals did not comprehend their role. In addition, it was further shown that there was no relationship between source of information and preconceptions about ARV's and source of information and cost of ARV's respectively. Thus implying that regardless of the source of information, most individuals knew the role and cost of ARV drugs for HIV positive patients.

From the study, stigma was the main constraint to the effective uptake of ARV drugs as approximately 50% of the respondents were unwilling to voluntarily be tested for HIV. Failure to get tested could lead potential HIV positive individuals to remain oblivious of their status. This would result in the individuals failing to seek treatment thus increasing their chances of mortality and their risk of spreading HIV. Data from the key informant at Kangemi Health Centre showed that about 80% of individuals diagnosed with HIV seek ARV treatment. This corresponds with the primary data which indicates that majority of the respondents were willing to seek ARV treatment if found to be HIV positive.

Based on information from the key informant at Kangemi Health Centre, 1200 people seek testing for HIV every month. This is a relatively high number. From the primary data, nearly half of the respondents were unwilling to be tested for HIV. Possibly, respondents had stigma and fear of exposing their willingness to seek HIV testing to their data enumerator. This might explain the disparity between the key informant and the primary data source.

Education level had minimal effects on the preconception of ARV drugs as most individuals understood the role of ARV's and had little impact on people's beliefs about HIV. However, level of education did have some impact on the willingness of the respondent to voluntarily be tested for HIV. Roughly, as the level of education increased, more individuals were willing to seek HIV testing facilities. Therefore, education does play a role in the willingness of Kangemi residents to test for HIV. Unfortunately, majority of the individuals in Kangemi have only obtained a primary

school education thus affecting their willingness to be tested. This increases the risk of transmitting HIV and contracting AIDS related diseases that increase the risk of mortality.

Elderly residents of Kangemi (42 and above) tended to be less supportive of the idea of being tested than younger respondents. Younger respondents had varying responses on this issue. This could be due to the fact that younger respondents engage in riskier behavior (“HIV and AIDS in Kenya”). In addition, since 76.47% of individuals who had either religious or cultural beliefs about HIV were aged 42 and above. Furthermore, this could indicate that younger generations are accessing more reliable and accurate information about HIV and ARV’s. This information is devoid of both cultural and religious beliefs about HIV hence the risks associated with HIV are clearly understood by the younger generation. This would then encourage them to seek HIV testing and reduce stigma. There is therefore an information gap relating to dissemination of information to the older generation.

### 5.3 Recommendations

From the given information and the conclusions that have been made, there are certain ways in which the negative effects of dissemination and comprehension of information, stigma, and availability of ARV’s in government hospitals may be minimized. From the data, it is evident that information from local government hospitals is not effectively reaching everyone within the population of Kangemi. Government hospitals should take further initiative to spread information about HIV and ARV’s to the local population. Additionally, as media is increasing its presence and influence in the lives of individuals, all forms of media should take more effort to spread information about HIV and ARV’s. The government can also take advantage of media to disseminate information about HIV and ARV’s to its citizens.

The study noticed that the elderly generation (42 and above) were more unwilling to be tested for HIV. Furthermore, a high percentage of respondents who had cultural and religious beliefs about HIV were aged 42 and above. This is indicative of their knowledge gap and high stigma regarding HIV. Information that is currently being provided appears to address stigma relating to HIV testing and ARV uptake. It is advisable that the government puts in place measures to disseminate more recent and highly accurate information about HIV and ARV’s to the elderly population.

The research established that stigma is the main constraint affecting uptake of ARV’s by slum dwellers in Kenya. The government can tackle this problem by using its agencies and institutions to directly address the issues of the fear of being tested and the fear of exposure of one’s status. For this to be achieved the government should direct more resources towards minimizing stigma. In addition, these fears can also be allayed by the media using different platforms to advertise the importance of being tested and of the uptake of ARV treatment. Moreover, family and friends should aid in decreasing stigma by encouraging individuals to seek HIV testing and treatment in local government hospitals not be ashamed of their status. Parents and guardians should

educate their children about HIV at an early age. This could lead to a reduction of stigma associated with misinformation about HIV. Persistence in addressing issues surrounding stigma related to HIV by all stake holders would eventually lead to a less stigmatized society.

Education level has impacted the willingness of individual’s to be tested for HIV. Higher levels of education lead individuals to be confident to get tested for HIV and consequently seek ARV treatment. Therefore, individuals in Kangemi should be provided with better schooling to decrease stigma and unwillingness to be tested for HIV. Lastly, government hospitals should ensure that they maintain contact with all individuals who are tested to be HIV positive. This is to ensure that all individuals confirmed to be HIV positive at the institution seek ARV treatment and regularly take their medication.

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