



**UNIVERSITY OF NAIROBI**

**SCHOOL OF ECONOMICS**

**DETERMINANTS OF PRE-EXPOSURE PROPHYLAXIS (PrEP) SERVICES UPTAKE: THE  
CASE OF AHERO COUNTY HOSPITAL, KISUMU COUNTY, KENYA.**

**BY**

**Cherotich Irine**

**X53/35772/2019**

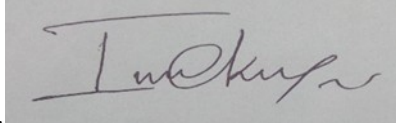
**Supervisor DR. Martine Oleche**

**A Final Research Report Submitted in Partial Fulfilment of the Requirements for the Award of the  
Degree of Master of Science in Health Economics and Policy of the University of Nairobi.**

**November, 2021**

**DECLARATION**

I, Cherotich Irine, hereby make the declaration that this research work is my original work and that it has not been submitted for the purpose of any academic award in any other higher learning institution.



Signature.....Date.....21/11/2021.....

**CERTIFICATE OF APPROVAL**

I certify that this research work has been submitted with my approval as the University supervisor.



Signature.....Date.....29.11.2021.....

Dr. Martine Oleche

## **DEDICATION**

I dedicate this research work to my husband Frank Jacobs, My son Jearim Jacobs and my daughters Levin Ruby and Leilah Ross. They have been a great source of motivation and encouragement to me.

## **ACKNOWLEDGEMENTS**

I would like to express my sincere gratitude to my supervisor Dr. Martine Oleche for tirelessly dedicating his time and effort to coach and guide me throughout the development of this project work.

## TABLE OF CONTENTS

|   |      |
|---|------|
| DECLARATION.....                                    | ii   |
| CERTIFICATE OF APPROVAL.....                        | iii  |
| DEDICATION.....                                     | iv   |
| ACKNOWLEDGEMENTS.....                               | v    |
| TABLE OF CONTENTS.....                              | vi   |
| LIST OF FIGURES.....                                | viii |
| LIST OF TABLES.....                                 | ix   |
| LIST OF ABBREVIATIONS.....                          | x    |
| ABSTRACT.....                                       | xii  |
| 1. CHAPTER ONE: INTRODUCTION.....                   | 1    |
| 1.1 Pre-Exposure Prophylaxis (PrEP).....            | 1    |
| 1.2 Problem statement.....                          | 3    |
| 1.3 Study Objectives.....                           | 4    |
| 1.4 Research questions.....                         | 5    |
| 1.5 Significance of the Study.....                  | 5    |
| 2. CHAPTER TWO: LITERATURE REVIEW.....              | 6    |
| 2.1 Introduction.....                               | 6    |
| 2.2 Theoretical Literature.....                     | 6    |
| 2.2.1. Health Belief Model.....                     | 6    |
| 2.2.2 The Health Promotion Model.....               | 6    |
| 2.3 Empirical Literature.....                       | 8    |
| 2.3.1 Pre-Exposure Prophylaxis (PrEP) Services..... | 8    |
| 2.3.2. Sociodemographic Factors.....                | 10   |
| 2.3.3. HIV Risk Status Assessment.....              | 11   |
| 2.3.4. Other Factors Influencing PrEP Uptake.....   | 12   |
| 2.4. Overview of Literature.....                    | 13   |
| 3. CHAPTER THREE: METHODOLOGY.....                  | 14   |
| 3.1 Introduction.....                               | 14   |
| 3.2 Conceptual Framework.....                       | 14   |
| 3.3 Research Design.....                            | 15   |
| 3.4 Target Population.....                          | 15   |

|  |    |
|--|----|
| 3.5 Sample Size and Sampling Technique.....                              | 15 |
| 3.6 Empirical Model and Specification.....                               | 15 |
| 3.7 Description of Variables and Measurement and the Expected Signs..... | 17 |
| 3.8. Data Types and Sources.....   | 18 |
| 3.9. Ethical Considerations.....   | 19 |
| 4. CHAPTER FOUR: RESULTS AND INTERPRETATIONS.....                        | 20 |
| 4.0 Introduction.....  | 20 |
| 4.1 Descriptive Summary Statistics.....                                  | 20 |
| 4.2. Probit Model Results and Interpretation.....                        | 25 |
| 5. CHAPTER FIVE: DISCUSSION OF FINDINGS AND CONCLUSIONS.....             | 31 |
| 5.0 Discussion of Findings.....  | 31 |
| 5.1 Conclusion and Policy Recommendations.....                           | 31 |
| 5.2 Study Limitations.....   | 31 |
| 5.3 Recommendations for Further Research.....                            | 32 |
| References.....  | 33 |

## LIST OF FIGURES

|  |    |
|--|----|
| Figure 1: The conceptual framework.....      | 14 |
| Figure 2: Prep Uptake.....                   | 22 |
| Figure 3: PrEP Initiation as per Gender..... | 23 |



## LIST OF TABLES

|  |    |
|--|----|
| Table 1: Definition, Measurement, and Expected Signs of variables..... | 17 |
| Table 2: Descriptive Statistics.....                                   | 21 |
| Table 3: PrEP Initiation as per Age.....                               | 22 |
| Table 4: PrEP Initiation as per Marital Status.....                    | 24 |
| Table 5: PrEP Initiation as per Population Type.....                   | 24 |
| Table 6: PrEP Initiation as Per Entry Point.....                       | 25 |
| Table 7: Probit Model Results.....                                     | 26 |

## **LIST OF ABBREVIATIONS**

|              |                                  |
|--------------|----------------------------------|
| <b>AGYW</b>  | Adolescent Girls and Young Women |
| <b>CDC</b>   | Centers for Disease Control      |
| <b>EMR</b>   | Electronic Medical Records       |
| <b>ERB</b>   | Ethical Review Board             |
| <b>HICs</b>  | High Income Countries            |
| <b>FDA</b>   | Food and Drug Act                |
| <b>FDC</b>   | Fixed Dose Combination           |
| <b>FSW</b>   | Female Sex Worker                |
| <b>GBV</b>   | Gender-Based Violence            |
| <b>GoK</b>   | Government of Kenya              |
| <b>HBM</b>   | Health Belief Model              |
| <b>HICs</b>  | High Income Countries            |
| <b>HIV</b>   | Human Immunodeficiency Virus     |
| <b>KDHS</b>  | Kenya Demographic Health Survey  |
| <b>LMICs</b> | Low- and Middle-Income Countries |
| <b>MARPS</b> | Most at Risk Populations         |
| <b>MoH</b>   | Ministry of Health               |
| <b>MSM</b>   | Men who have Sex with Men        |

|               |   |
|---------------|---|
| <b>NACC</b>   | National AIDS Control Council               |
| <b>NASCOP</b> | National AIDS & STIs Control Program        |
| <b>PEP</b>    | Post-Exposure Prophylaxis                   |
| <b>PrEP</b>   | Pre-Exposure Prophylaxis                    |
| <b>RAST</b>   | Risk Assessment Tool                        |
| <b>SDC</b>    | Sero-Discordant Couples                     |
| <b>SPSS</b>   | Statistical Package for the Social Sciences |
| <b>UNAIDS</b> | United Nations Programme on AIDS            |
| <b>VMMC</b>   | Voluntary Medical Male Circumcision         |
| <b>WHO</b>    | World Health Organization                   |

## **ABSTRACT**

HIV/AIDS is considered a global burden and imposes significant strain and burden to the healthcare systems. Majority of new HIV infections annually occur in Sub-Saharan Africa. Kenya records significant mortalities and morbidities due to HIV/AIDS. Nonetheless, it has put in appreciable effort in implementing programs geared at reducing HIV prevalence. PrEP is one of the preventive measures approved by the Kenyan government. It was first launched in the year 2016 and rolled out nationally in 2017. However, there are still gaps in PrEP uptake to date and its utilization among the populations at risk of getting HIV infection are still suboptimal. This study sought to assess the determinants of PrEP uptake at Ahero County Hospital which is located in Nyanza region which is known to record high HIV infection prevalence rates. The study adopted a retrospective cross-sectional study design which involved abstraction of data from the PrEP registers, Client clinical encounter form (PrEP Cards), and RAST forms for all individuals eligible for PrEP as well as those initiated on PrEP in the year 2019. Probit model was applied in the empirical analysis of data obtained. Findings from this study indicate significant determinants that influence whether an eligible individual gets initiated of PrEP include age, gender, point of entry and the presence of risk factors such as HIV positive partner, sexual partner's unknown HIV status, recent STI, and sex under the influence of alcohol. The age group found at high risk of HIV infection is 15-24years, however, PrEP uptake associated with this age group is also significantly low. PrEP uptake still remains at low levels than expected with less than 50% of those found at risk of contracting HIV not going ahead to use PrEP. The entry points play a crucial role and entry points that capture the generation at most risk i.e. PEER centers as well as VCT are highly recommended to be given more consideration being the point of entry most accessed by age set at most risk.

## **1. CHAPTER ONE: INTRODUCTION**

### **1.1 Pre-Exposure Prophylaxis (PrEP)**

HIV/AIDS imposes significant strain and global health burden with more than 1.7 million persons being reported to have got newly infected with HIV annually. The bigger proportion of new infections are recorded in Africa specifically the Sub-Saharan region which reports a record of >600 000 new Human immunodeficiency Virus infections each year among young women (UNAIDS, 2021). HIV/AIDS is still a big issue in Kenya that causes significant mortalities and morbidities. Nonetheless, Kenya has made big strides in regards to significantly lowering the incidence of HIV infections. There are various HIV/AIDS services targeted at prevention that have been put in place including offering Pre-Exposure Prophylaxis to individuals who meet the proposed eligibility criteria as per the NASCOP guidelines and have substantial ongoing risk(s) predisposing them to high chances of contracting HIV.

Pre-exposure prophylaxis refers to a biomedical preventive measure used in combination with other prescribed HIV prevention strategies aimed at protecting HIV negative individuals at risk to from contracting HIV infection (CDC, 2018). PrEP belongs to the antiretroviral class of drugs and the most recommended regimen is tenofovir and emtricitabine which is a fixed dose combination (FDC). It is given daily to HIV negative patients and the tablet is commonly referred to as Truvada™. FDA approved the drug in the year 2012 and it was first implemented in 2012 at San Francisco in USA (AIDSMAP, 2015). WHO approved the use of this drug formally in the year 2014 as one of the preventive measures for HIV negative people (WHO, 2014). The drug was initially designed for individuals categorized as high risk including sexual workers, gays, lesbians and PWIDs. However, in the year 2015 WHO released new guidelines and policies that highlighted the recommendation of PrEP to be availed as a HIV prevention choice to persons assessed to be at substantial and ongoing risk of acquiring HIV. It was

recommended for use in combination with other HIV prevention approaches by implementing programs (WHO, 2015).

Despite USA approving the drug in the year 2012, it released the clinical guidelines in the year 2014 and then France issued the clinical guidelines on first January 2016 (Calabrese, S. & Willie, T., 2019). Kenya is among the first countries alongside South Africa in the Sub-Saharan region to begin implementing the use of this drug. South Africa is the African was the first nation in the developing countries to issue full regulatory approval for PrEP then it was later followed by Kenya (WHO, 2015).

PrEP had been proven to be more than 90% effective as preventive strategies among its users and its efficiency when used in combined with other methods targeted at HIV prevention such as condoms, it provided greater protection against contracting HIV infection (UNAIDS, 2018). Further it had been shown that the drug had reduced the risk of transmitting HIV through unprotected sex by more than 85% and by over 70 percent through injection (CDC, 2016). In the United Kingdom half of the gays had shown interest in taking the drug and by 2020 this was projected to reduce the risk by over 7000 while in India more than 92% gays had demonstrated interest on use of the drug (Molina et al., 2015).

In Kenya, PrEP was approved by the Kenya Pharmacy and Poisons board in 2015 and as of 2016, oral PrEP was rolled out nationally (NASCOP, 2017). According to Masyuko et al, 2018, at one year after rolling out of PrEP in 2016, there were approximately 14,000 PrEP users. As at January 2019, the number was estimated to be approximately 25,000. Various donors including Global Fund and PEPFAR provide funding and this has facilitated PrEP provision in the public facilities (AIDSMAP, 2019).

## **1.2 Problem statement**

Pre-Exposure Prophylaxis is biomedical approach to HIV prevention recommended to be used alongside other recommended biomedical, structural and behavioral HIV prevention strategies. PrEP is offered to any individual who is at substantially high and ongoing risk of acquiring HIV infection. It is one of the current ways through which Kenya wants to achieve its target of reducing incidence of HIV infections. It has been noted that approximately 50% new infections occur among young adults aged 15-24 years with women contributing the biggest percentage. Key populations i.e. FSWs, PWID, and MSMs also contribute a significant percentage of new HIV infections approximated to be 35% in the country (UNAIDS, 2019).

At the global level, PrEP is being implemented and there is significant variations in the degree of interest in regards to Most at risk populations (MARPs). MSMs in the U.S, Australia and Europe have shown high acceptability levels for PrEP despite access barriers and related costs (McCormack, Nosedá, & Molina, 2016). However, in the Sub-Saharan Africa, data regarding acceptability are limited. There are only a few studies that demonstrate high acceptability levels among MSM (Golub, Gamarel, Rendina, Surace, & Lelutiu-Weinberger, 2013). Variable acceptability has also been witnessed among AGYW (Adolescent girls and young women) (Reza-Paul, Lazarus, Presley, & Lorway, 2019).

Despite PrEP being availed for free to users especially in the public health facilities here in Kenya, the uptake has been demonstrated to be significantly lower than expected. AIDSMAP 2019 shared a report in the 10<sup>th</sup> IAS (International AIDS Society) conference which highlighted there being an increasing PrEP roll-out in the country in May 2017 but the uptake was noted to be slower than it were expected.

A study conducted in the rural settings of Kenya and Uganda revealed that in the PrEP cascade, PrEP uptake is the considered the biggest gap noticed especially for the mobile as well as young individuals (15-24 years) (Koss, et al., 2020). It has been noted that there exists a serious discrepancy between who accesses PrEP currently and who actually benefits most from PrEP (AVERT, 2019). Understanding Oral PrEP initiation as well as continuation is a priority to the Ministry of Health. Monitoring data will allow for tracking PrEP programs' outputs, however, it won't give detailed information in regards to the factors that may influence the observed trends (Pillay, et al., 2020). This further emphasizes the need to find out and thoroughly analyze determinants of PrEP among populations at risk.

In 2015, WHO recognized that PrEP offered potential population-wide benefits, and went ahead to release new PrEP guidelines that outlined the recommendation that PrEP be provided as a choice of HIV prevention for individuals at substantial as well as ongoing risk of getting infected with HIV. However, it to be provided in combination with other existing HIV prevention strategies. PrEP was initially recommended for Key populations such as MSM, sex workers, and PWID (People who Inject Drugs). This study specifically focused on all individuals who have been initiated on PrEP at Ahero County Hospital and not just a subset of key populations or groups on PrEP. Most studies done in the Nyanza region earlier focused on key populations i.e. MSM, FSWs, and AGYW.

### **1.3 Study Objectives**

The study's main objective was to assess the determinants of Pre-Exposure Prophylaxis (PrEP) uptake in Ahero County Hospital. The specific objectives are:

- i. To determine the PrEP uptake status for the population seeking Prep at in Ahero County Hospital?
- ii. To assess the factors that influence PrEP uptake in Ahero County Hospital.



- iii. To find out the relationship between the interaction of risk assessment findings and PrEP uptake among individuals initiated on PrEP at Ahero County Hospital

#### **1.4 Research questions**

This study sought to find answers for the following questions:

- i. What is the PrEP uptake status for the population seeking Prep at in Ahero County Hospital?
- ii. What factors influence PrEP uptake in Ahero County Hospital?
- iii. What is the relationship between the interaction of risk status assessment findings and PrEP Uptake among individuals who access PrEP services at Ahero County Hospital?

#### **1.5 Significance of the Study**

Approximately 65% of the HIV burden in Kenya occurs in 9 out of the 47 counties with those around the Lake Victoria region being most affected (Dwyer-Lindgren, et al., 2019). Nyanza region in Kenya records high prevalence rate of HIV and was among the first regions that implemented PrEP services for populations at risk. Various implementation programs including the DREAMS initiative run in the region with the aim of increasing PrEP uptake among populations at risk (Jackson-Gibson, et al., 2021).

The low uptake of PrEP despite high sexual risk behaviors among the population being high was found to be associated with lack of the drugs in the health facilities, lack of awareness among the general population, health workers attitude, treatment oversight and stigma in clinics and the community (Kiplagat & Nancy 2018). Nonetheless, looking into the determinants of PrEP uptake will provide a clearer roadmap on how to integrate PrEP services better in the facilities in order to increase uptake. Determining the existing relationships between the various determinants and PrEP uptake will aid in development of targeted strategies as well as policy changes or adjustments bound to help boost PrEP uptake/generate demand among populations at risk.

## **2. CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter will highlight in detail existing theories which give an explanation to observed trends in the utilization of healthcare services including the use of PrEP services to prevent HIV infection. The literature review will entail highlights from previous research, reports from agencies and the relevant ministry as well as reports from conferences. The review is categorized into two sections i.e., theoretical literature and the empirical literature.

### **2.2 Theoretical Literature**

#### **2.2.1. Health Belief Model**

HBM was first developed in the 1950s and it was originally designed to help explain preventive behaviors, (Rosenstock, 1990). Its aim was to help understand why people failed to adopt screening tests or disease prevention strategies. HBM proposes that individuals are more likely to engage in a given behavior in the following situations; if the perceived susceptibility as well as severity of the disease or condition is high; if there are high benefits associated with engaging in the behavior and the associated barrier are substantially low, and in the presence of a high motivation propelling one to engage in the health behavior. In regards to PrEP uptake, individuals opt to be initiated on PrEP depending on the perceived risk status as well as several other factors that influence their decisions to take or not use PrEP including staff attitudes, possible side effects, stigma issues, and related costs.

#### **2.2.2 The Health Promotion Model**

Nola J. Pender came up with HBM with purpose of making it a complementary counterpart to other models on health protection. The sole goal of health promotion is increasing the level of a patient's well-being. This model seeks to give a detailed description of the multidimensional nature of persons and their interaction within their environment as they pursue health. The Health Promotion Model points out the various factors that influence motivation to get

involved in health-promoting behaviors as well as focuses on the interactions of individuals with their interpersonal and physical environments in their pursuit to improve health.

The three areas focused on in the model are: one's experiences and characteristics, cognitions and affect deemed to be behavior-specific, as well as behavioral outcomes. The health promotion model theory points out that each individual possesses unique characteristics and experiences which influence their subsequent actions. In regards to behavior-specific affect and cognitions, these set of variables have an immense motivational significance and can be modified appropriately to achieve the desired health promotion behavior. This hence marks the end point of the Health Promotion Model. The behaviors are aimed at improving health, achieving enhanced functional ability and improving one's quality of life. However, the influence of immediate competing demand as well as preferences on the final behavior demand can have a negative impact on the actions intended to promote health.

The Health Promotion Model is a theory based on four assumptions which are: individuals engage in active regulation of their own health; individuals interact with their environment in all their biopsychosocial complexity hence progressively get transformed as they transform their environment; health professionals form part of the individuals interpersonal environment and exert influence on people; and that self-initiated reconfigurations on the interactive patterns in the person-environment are crucial to changing behavior. The model has thirteen theoretical statements that stem from it which include fact that people purpose to engage in behaviors that they are bound to gain valued benefits from at a personal level, perceived barriers likely to hinder commitment to act, and situational influences that occur in the individuals external environment which can either increase or reduce one's commitment to participation in a given health promoting behavior among others. In regards to PrEP, an individual has control over

whether to take PrEP or not and this is further influenced by perceived barriers and interaction with healthcare professionals.

## **2.3 Empirical Literature**

### **2.3.1 Pre-Exposure Prophylaxis (PrEP) Services.**

HIV/AIDS was first discovered in the early 1980s and is considered a pandemic that is recognized a global crisis which has posed significant burden to all countries in the world (Simon, V., David, D., & Karim, A., 2016). The burden is high among the youths in the world with the youths aged 15- 24 years being the most affected population (World Health Organization 2018). Globally by the year 2017 there was a record of approximately 36.9 million individuals living with AIDS, new incidences reported were 77.3 million people and mortalities reported were 35.4 million as result of this pandemic (WHO,2018).

There have been remarkable progress in regards to scaling up of HIV testing as well as the provision of HIV treatment worldwide. However, in the year 2018 it was estimated that there were approximately 1.7 million new cases of HIV infection and UNAIDS termed this as a prevention crisis.

According to 2015 HIV estimate reports, Kisumu County is top four and the prevalence of HIV infections in the county was 3.4 times higher than national prevalence; 19.9% (Kenya Demographic Health Survey, 2014) and by the end of the year 2015 almost 145,000 people were living with the infection and 22% of these were youths aged 15-24 years (National county population development, 2017). The findings warrant the need for continuity of provision of diverse HIV prevention services outlined in the guidelines including PrEP in the health facilities.

PrEP is one of the preventive measure tools used by HIV negative patients at risk to prevent them from contracting the infection (CDC, 2018). PrEP recommended antiretroviral drug is a

fixed dose combination (FDC) of tenofovir and emtricitabine given daily to HIV negative patients and the tablet is commonly known as Truvada™. It was approved in 2012 by the Food and Drug act (FDA) and was first implemented in 2012 at San Francisco in USA and adherence remained over 95% after one month and continued to drop over subsequent months (AIDSMAP, 2015). The drug was approved by the Kenya Pharmacy and Poisons board in 2015 and as of 2016, oral PrEP was rolled out nationally (NASCO, 2017). PrEP was launched in the month of May 2017 and now it is available to the public in over 900 facilities in Kenya (Masyuko, et al., 2018).

Globally approximately 310, 000 people were registered as users of the drug among 68 countries although more than 70% of the registered users were from North America while in Sub-Saharan Africa 140,000 people mostly AGYW were on PrEP compared to the estimated target of around 142,000 and the most users in Africa are in countries such as South Africa, Uganda, Zimbabwe and Lesotho (UNAIDS, 2018). Most of these users are the high-risk individuals such as gays, discordant couples, lesbians and female sex adolescent young women.

In Kenya the estimated number of PrEP users were between 53,000 -54,000 and the drug was approved in Kenya in December 2015 (Ministry of Health, 2016). The low uptake of this drug despite high sexual risk behaviors among the population being high was found to be associated with lack of the drugs in the health facilities, lack of awareness among the general population, health workers attitude, treatment oversight and stigma in clinics and the community are the major key barriers (Kiplagat & Nancy 2018).

Sub-Saharan Africa is the leading continent in the world with a high burden of people living and dying from HIV/AIDS and youths account for the majority of the mortalities. However, as a strategy of averting HIV pandemic, in the year 2015 new guidelines and policies were released

which passed the recommendation that PrEP be given as a HIV prevention choice to persons who are at ongoing and substantially high risk of getting infected with the virus especially the youths despite the initial design of the drug which only targeted on high sexual risk individuals (WHO, 2015). This was after the realization that the infection is currently prevalent on the low risk individuals especially the youths as exemplified by 45% of new HIV infections occurring among the youth in Nigeria (Abayomi, J., Ebenezer, O., Olonisakin, O. & Peter, O., 2018).

Despite the tremendous recent advances achieved in biomedical HIV-targeted preventive strategies, the World Health Organization reported that the young adults still remain to be at high risk of getting HIV infection (WHO, 2014). Globally new incidences of HIV infections are largely accounted for by young adults and they are also reported to succumb causes related to HIV in most instances. In the year 2017, reports on HIV AIDS indicated that 1.8 million people acquired HIV infection and 940 000 died of AIDS pandemic and approximately over 36 million individuals are currently living with AIDS (UNAIDS, 2018). A report made in 2017 on HIV AIDS indicated that Eastern Africa and southern Africa accounted for the larger incidences of the infection with approximately 800,000 cases reported of which more than two-thirds of these cases were the young youths; mostly students (UNAIDS, 2018). This data indicates that the new incidences of HIV infections are high implicating that the utilization of PrEP is low in most countries.

### **2.3.2. Sociodemographic Factors**

Sociodemographic characteristics such as gender, age, marital status, population type, and education status significantly influence the uptake of PrEP. A study carried out in South Africa revealed that most of the participants' relationship status was single and that participants at the

MSM sites demonstrated tertiary education of higher level compared to sex worker sites (Pillay, et al., 2020).

AIDSMAP, 2020 reported that in a survey done in Kenya and Uganda regarding PrEP uptake and adherence, findings demonstrated that the youth aged between 25 and 34 years were estimated to be 39 percent less likely to get initiated on PrEP compared to people aged 35-44 years. Surprisingly, those aged 15-25 years were even worse with very high percentage not starting PrEP (45% less likely). From the survey, it was also evident the polygamous or divorced/widowed/separated had higher likelihood of starting PrEP compared to the single individuals. From this survey, it was found out that men of 25 to 34 years demonstrated lower chances of starting PrEP as compared to men aged 35 years or more. Contrary to these findings, and for the women aged between 25 and 34 years they were rated to be 48% less likely to get initiated on PrEP.

A study conducted in rural Western Kenya looking into the uptake of PrEP among older individuals demonstrated that the difference in regards to gender observed in the uptake of PrEP was significant. Uptake of PrEP was higher among the male participants compared with the female participants (Oilo, et al., 2019).

UNAIDS, 2018 reported observations made from other studies which demonstrated low PrEP uptake as well as adherence among women. There is underutilization of PrEP as a method of preventing HIV infection and it is clear that women are more burdened with HIV due to various vulnerabilities such as political, socio-cultural and economic inequalities. This is further worsened by barriers to access the services due to lack of education, spousal consent etc. These are some of the reasons that explain low uptake among women.

### **2.3.3. HIV Risk Status Assessment**

The primary reason for an individual being initiated on PrEP is related to the risk he or she perceives to be associated with engaging in unprotected sex. It was demonstrated in a study done among FSWs and MSMs that there was higher perceived risk of getting HIV infection in the Sex worker sites (61.6 percent) compared to sites with MSM (35.4 percent). There was higher likelihood of sex workers exchanging sex for money favors compared to the MSM. (Pillay, et al., 2020).

Another study conducted in China among MSM revealed that perceived high risk of getting HIV infection served as one of the main motivators for PrEP use (Chunxing Liu 1, et al., 2018). Study findings from a study done to determine factors influencing the uptake of PrEP among current users indicated that an increase in risk perception prompted users to be initiated on PrEP among other factors such as increase in knowledge, PrEP access, and sexual health education (Aidoo-Frimpong, Wilson, & Przybyla, 2020). A study done among young people in Zimbabwe, S. Africa, and Uganda revealed that high HIV risk perception translated to increased PrEP uptake (Muhumuza, et al., 2021).

AIDSMAP, 2020 reports that findings from an interim survey done in Kenya and Uganda on PrEP uptake and adherence indicated that over 25% of people at risk as per assessment started PrEP of which approximately 56 percent maintained consistent engagement with PrEP program. People with HIV infected partners especially negative females in sero-discordant relationships were also associated with high likelihood of getting initiated on PrEP i.e. two times more likely to be initiated on PrEP.



#### **2.3.4. Other Factors Influencing PrEP Uptake**

A study conducted in Seme Sub-County, Kisumu related to PrEP Uptake revealed facilitators to include the use of safe places and peer mentors among others. Noted barriers included community stigma, frequent relocation of PrEP users, side effects associated with PrEP, and limited human and financial resources. The researchers concluded that the facilitators increased PrEP initiation and highlighted need to address the barriers in order to improve uptake of PrEP (Jackson-Gibson, et al., 2021).

Study findings from a study done among sero-discordant couples in East Africa revealed that approximately 80% of the couples indicated desire to have children. It was estimated that 89.2% of the couples used ART or PrEP for a period of six months before the pregnancy and there were no sero-conversions (Heffron, et al., 2018). Another study recommended that there is need to integrate PrEP in programs targeted at achieving safer conception among couples for it helps reduce HIV transmission during the pre-conception period (Heffron, Pintye, Matthews, Weber, & Mugo, 2018).

#### **2.4. Overview of Literature**

It is evident from the studies done that PrEP uptake is still sub-optimal. Uptake of PrEP, among eligible groups as evident from past studies remains low in developing countries. From the literature, sociodemographic characteristics as well as perceived risk of HIV infection have had significant influence on PrEP uptake. There still limited data in regards to influence of fertility intentions and PrEP uptake and the available studies have focused on sero-discordant couples (SDC). Most studies focused on key populations and specific groups in the population. This study will highlight determinants of PrEP uptake by covering all population types.

### 3. CHAPTER THREE: METHODOLOGY

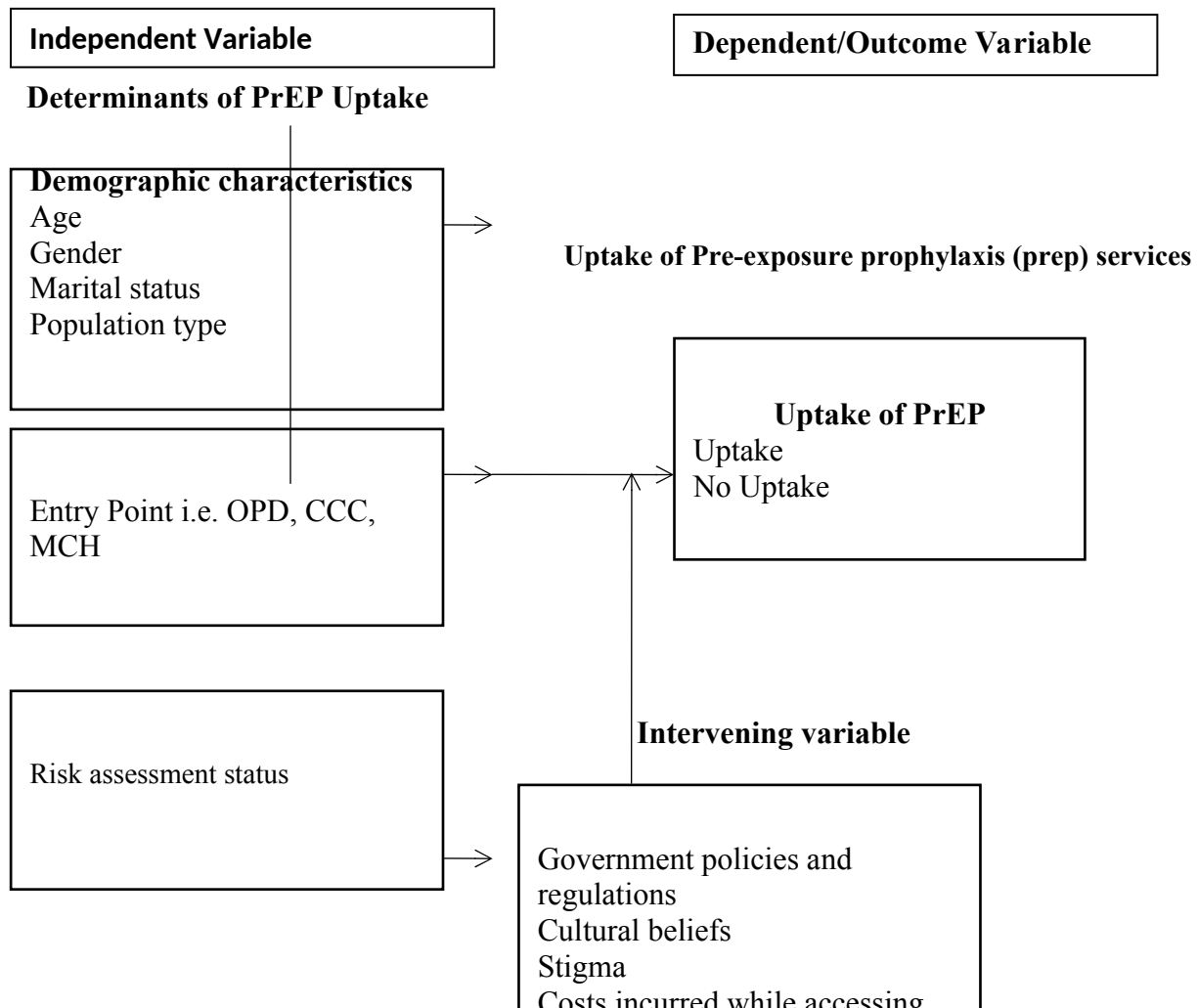
#### 3.1 Introduction

This chapter highlights the conceptual framework and further discusses the methods that the study utilized. Key things elaborated in this section include the adopted empirical model, the definition, measurement of key variables, the associated data types and sources and the ethical considerations.

#### 3.2 Conceptual Framework

Figure 1: The conceptual framework

The conceptual framework is as indicated in Figure 1



Source: Author's (2021).

### **3.3 Research Design**

This study adopted a retrospective cross-sectional research design. It will entail obtaining appropriate data of individuals initiated on PrEP in the year 2019. Cross-sectional design basically involves studying a population to determine prevalence of risk factors in the defined population by taking a snap-shot i.e., single point in time (Patton, 1990). This approach is suitable for determining existing relationships and not causal associations between outcome and the risk factors. This study will focus on examining PrEP related data from a cross-sectional perspective i.e. analysis will be done for all data obtained for individuals initiated on PrEP in the year 2019. The retrospective aspect comes in since this study will utilize data obtained in the past. The data was retrieved from the Ahero County Hospital's PrEP registers, Clinical encounter forms and the RAST forms.

### **3.4 Target Population**

Mugenda and Mugenda (2003) goes ahead to state that a population refers to the entire group of people or rather items being put under consideration in any given field of inquiry. What is evident is that they do have common attributes. The target population comprised of all individuals aged 15 years and above who were eligible for PrEP initiation at Ahero County hospital located in Kisumu County in the year 2019.

### **3.5 Sample Size and Sampling Technique**

Kothari (2004) points out that sampling entails the selection of a number of individuals to participate in a given study and this is done in such a manner that the chosen individual is a representative of a larger group i.e. the group they got selected from. Statements that are made in regards to the sample should be true of the entire population too (Mugenda and Mugenda 2003). Data was abstracted for all individuals aged 15 years and above who were found eligible for PrEP initiation at Ahero County Hospital in the year 2019.

### 3.6 Empirical Model and Specification

Following previous studies that have made the assumption that the data depicts a normal distribution, this study used probit model. The main focus of study was to make an interpretation in regards to the dependent or response variable as the probability of PrEP uptake and no PrEP uptake given other predictor or explanatory variables.

The assumption made here is that there exists a linear relationship between the dependent latent variable  $Y^*$  and predictor variables ( $x_i$ ).

Since the study wanted to analyze how various factors influence Prep Uptake i.e. sociodemographic, Risk assessment status, entry point, circumcision, and fertility intentions (predictor /independent/explanatory variables) influence PrEP uptake (dependent variables), we also make the assumption that the relationship is linear, thus;

If predictor variables = X and,

Dependent variables = Y then the resultant structural model would be expressed as follows;

$$Y^* = X_i \beta + \varepsilon \dots\dots\dots 1$$

Where  $\beta$  is refers to a vector for parameters that will be estimated and  $\varepsilon$  denotes the error term.

To determine the influence of explanatory or independent variables (X) on an individual to use PrEP we go ahead and regress the average characteristics against the dependent/response variable (Y).

Since the dependent (response/latent) variable is that there is equivalent to either PrEP Uptake (1) or no PrEP uptake (0) then the binary variable and latent variable link is expressed as follows:

$$Y = \begin{cases} 1 & \text{if } Y^* > K \\ 0 & \text{if } Y^* \leq K \end{cases} \dots\dots\dots 2$$

In this case, Y is refers to the probability of PrEP uptake whereas K stands for the threshold or otherwise the critical point of  $Y^*$  (latent variable) beyond which one opts to use PrEP.

The probit linear regression model can thus be expressed as shown below;

$$= \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon \dots\dots\dots 3$$

Where  $Pr^{ep}$  - PrEP uptake

$\beta_0$  – refers to the coefficient constant

$\beta_1 - \beta_{11}$  – are the coefficients to be estimated

$X_1$ - age

$X_2$ - gender

$X_3$ - marital status

$X_4$ - Entry point

$X_5$ - Population Type

$X_6$ - HIV Risk status assessment

$\varepsilon$  – error term.

$$Y^* = X_i \beta + \varepsilon$$

Where  $Y^*$  denotes the unobserved latent variable. It ranges from  $-\infty$  to  $\infty$

$X_i$  is a vector of predictor variables

$\beta$  is a vector of the various parameters yet to be estimated

$\varepsilon$  refers to the error term.

The characteristics of X are averaged then regressed against Y. This aids in determining the influence each variable has on the probability of an individual making the decision to be initiated on PrEP.

PrEP uptake will be presented as a function of a number of variables like the age, marital status, education status, sex, HIV risk status, entry point, and fertility intentions. Thus, the probit model can be shown as;

$$PrEP \text{ Uptake} = \beta_0 + \beta_1 Age + \beta_2 Gender + \beta_3 Marital \text{ Status} + \beta_4 \text{ Entry point} + \beta_6 HIV \text{ Risk Status} + \beta_5 \text{ Population type,} + \beta_6 \text{ entry point,} + \varepsilon \dots\dots\dots 4$$

### 3.7 Description of Variables and Measurement and the Expected Signs

The variables used in the model are as shown in Table 1.

Table 1: Definition, Measurement, and Expected Signs of variables

| <b>Variables</b>                                | <b>Measurement description</b>  | <b>Expected sign</b>    |
|---|---|-------------------------|
| <b>Dependent variable</b>                       |   |                         |
| PrEP Uptake                                     | 1 if there is PrEP uptake and 0 if there is no PrEP uptake.   | -/+ (Positive/Negative) |
| <b>Independent variables</b>                    |   |                         |
| Age   | 15-24years = 0<br>25- 34years = 1<br>35- 50 years = 2<br>Above 50 years = 3   | Negative/Positive       |
| Gender  | Male = 1<br>Female = 0  | Negative / Positive     |
| Marital status                                  | Never married = 0<br>Cohabiting =1<br>Married monogamous=2<br>Married polygamous = 3<br>Separated/divorced = 4<br>Widowed = 5 | Negative/Positive       |
| Population type                                 | General population=0<br>MSM = 1<br>Female Sex Worker = 2<br>Sero-discordant = 3   | Negative/Positive       |
| <b>HIV Risk status</b>                          |   |                         |
| HIV positive sex partner                        | Yes = 1<br>No = 0   | Positive                |
| Sex partner(s) high risk and HIV status unknown | Yes = 1<br>No = 0   | Negative                |
| Having sex with >1 sex partner                  | Yes = 1<br>No = 0   | Positive                |
| Ongoing IPV/GBV                                 | Yes = 1<br>No = 0   | Negative                |
| Transactional sex                               | Yes = 1<br>No = 0   | Positive                |
| Recent STI (Past 6 months)                      | Yes = 1<br>No = 0   | Positive                |
| Recurrent sex under influence of Alcohol        | Yes = 1<br>No = 0   | Positive                |
| Inconsistent or no condom use                   | Yes = 1<br>No = 0   | Negative                |
| Entry Point                                     | CCC = 0   | Negative/Positive       |

|  |   |  |
|--|---|--|
|  | MCH = 1<br>Peer = 2<br>OPD=3<br>Other = 4 |  |
|--|---|--|

### **3.8. Data Types and Sources**

Data was retrieved from the PrEP registers, clinical encounter forms, and RAST forms.

Appropriate data on PrEP utilization only was obtained.

In this study, data of all individuals aged 15 years and above who were eligible for PrEP initiation at Ahero County Hospital in the year 2019 got abstracted.

### **3.9. Ethical Considerations**

A number of research ethics were strictly adhered to in this study in that research was conducted for academic purpose only. The major ethical problem in the study was confidentiality and in regards to this, all extracted data got de-identified and coded.

The permission to conduct the research was sought from the University of Nairobi Ethical Review Board. The permission to access data was sought from the Ahero County Hospital in writing through the Ministry of Health, Kisumu County.

Finally, proper citation and acknowledgement of all borrowed ideas was done. The research's originality was safeguarded by ensuring the whole proposal got scanned for plagiarism using Turnitin software. The minimum threshold as outlined by the outline policies was the guiding limit and this was achieved.

## **4. CHAPTER FOUR: RESULTS AND INTERPRETATIONS**

### **4.0 Introduction**

This chapter highlights descriptive statistics in detail as well as the results obtained from the probit model-based analyses on the determinants of PrEP uptake at Ahero County Hospital.

### **4.1 Descriptive Summary Statistics**

Data cleaning was done and descriptive statistics carried out on the demographic characteristics of those who were eligible for PrEP services. Descriptive statistics generated included: mean, standard deviation, minimum and maximum value. The results were as shown in table 2.



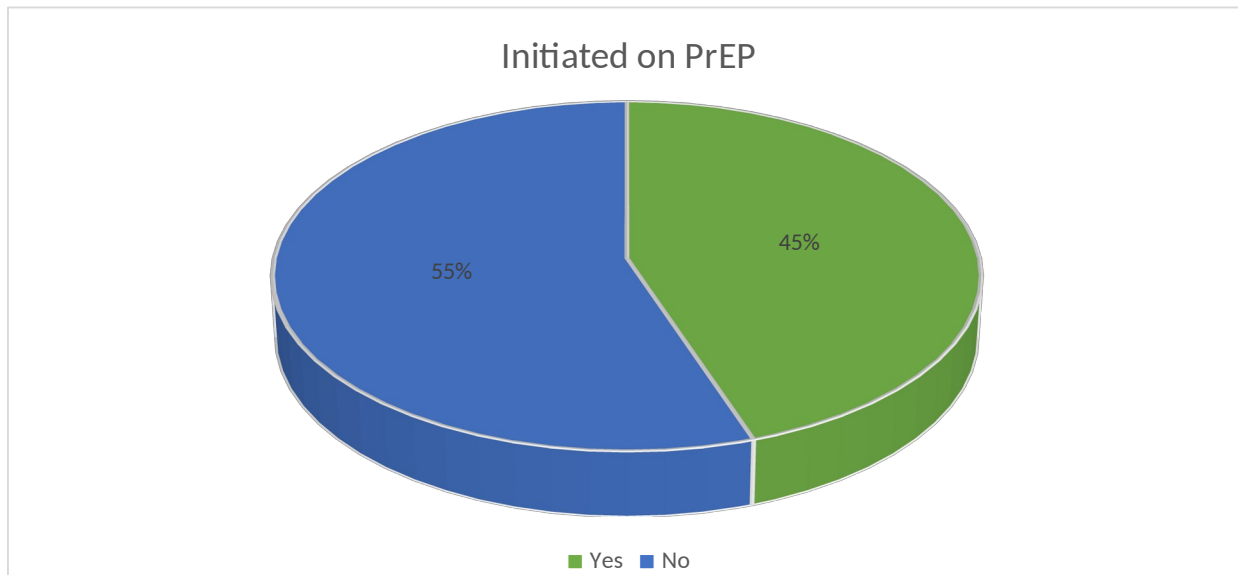
Table 2: Descriptive Statistics

|                                | N   | Max. | Min. | Mean | Std. Error | Std. Deviation |
|--------------------------------|-----|------|------|------|------------|----------------|
| Initiated on PrEP              | 429 | 0    | 1    | .45  | .024       | .498           |
| Age                            | 429 | 0    | 3    | .75  | .042       | .864           |
| Gender                         | 429 | 0    | 1    | .25  | .021       | .433           |
| Marital Status                 | 429 | 0    | 5    | 1.40 | .060       | 1.250          |
| Population type                | 429 | 0    | 3    | 0.86 | 0.64       | 1.330          |
| HIV positive partner           | 429 | 0    | 1    | .26  | .021       | .441           |
| Sex partner of Unknown status  | 429 | 0    | 1    | .73  | .022       | .446           |
| Sex with >1 partner            | 429 | 0    | 1    | .18  | .019       | .384           |
| Ongoing IPV/GBV                | 429 | 0    | 1    | .03  | .008       | .165           |
| Transactional sex              | 429 | 0    | 1    | .08  | .013       | .270           |
| Recent STI                     | 429 | 0    | 1    | .10  | .014       | .298           |
| Sex under influence of Alcohol | 429 | 0    | 1    | .12  | .016       | .321           |
| No condom use                  | 429 | 0    | 1    | .98  | .006       | .127           |
| Entry point                    | 429 | 0    | 1    | 2.37 | 1.816      | 3.229          |

The total population surveyed consisted of 429 individuals out of which approximately 45% got initiated on PrEP. The results demonstrated that 26% had HIV positive partner and majority did not know the HIV status of their sex partner(s) estimated at 73 percent. Findings indicate that 18 percent of the individuals surveyed had more than one sexual partner. Only 3 percent of the surveyed population reported ongoing IPV or GBV. The proportion of those who had transactional sex was at 8% and those who had recent STI was 10% of the surveyed population

and 98% reported no condom use during sexual intercourse. Findings also pointed out that 12% the surveyed population had history of sex under the influence of alcohol.

Figure 2: Prep Uptake



In regards to initiation on PrEP in the year 2019 at Ahero County Hospital, out of the 429 surveyed individuals who were eligible for PrEP initiation, only 192 individuals went ahead to get initiated on PrEP. This translates to 45% of the surveyed population. These results confirm AIDS MAP report in the 10<sup>th</sup> IAS (International AIDS Society) conference which highlighted there being an increasing PrEP roll-out in the country in May 2017 but the uptake was noted to be slower than it was expected (AIDS MAP, 2019).

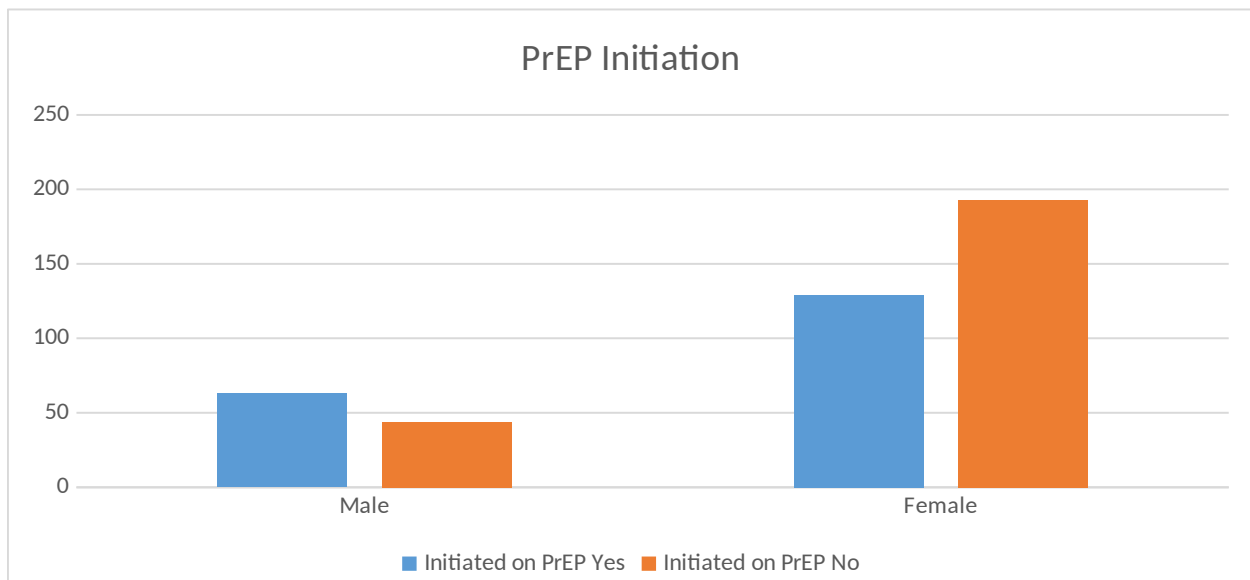
Table 3: PrEP Initiation as per Age

| Initiate<br>d on<br>Prep | Age         |             |             |               | Total |
|--------------------------|-------------|-------------|-------------|---------------|-------|
|                          | 15-24 Years | 25-34 Years | 35-50 Years | Over 50 years |       |
| Yes                      | 79          | 70          | 34          | 9             | 192   |
| No                       | 132         | 63          | 34          | 8             | 237   |
| Total                    | 211         | 133         | 68          | 17            | 429   |

The findings of the study indicated that 49.2 percent (n=211) of those surveyed were aged 15-24 years, 31.0 percent (n=133) were aged 25-34 years, 15.9 percent (n=68) were aged 35-50 years

and 4.0 (n=17) percent were aged 50 years above. Majority of those initiated on PrEP were aged between 15-24 years, however, in this category out of 211 found eligible for PrEP, only 37.44% went ahead to be started on PrEP. This finding confirms previous findings by Koss et.al. (2020) that PrEP uptake is lower among young individuals (15-24 years. Those aged above 50 years contributed the least proportion to those initiated (4.7%), however, for this category out of the total number found eligible, 53% got initiated on PrEP and a similar observation was made for the age category 25-34 years which recorded initiation rate of 53% for the number found eligible.

Figure 3: PrEP Initiation as per Gender



From the survey, 75.1 percent of the respondents surveyed who were eligible for PrEP were female whereas 24.9 percent were male. For those who went ahead to be initiated on PrEP, 32.81% (n=63) were male and 67.19% (n=129) were female. The findings demonstrated that majority of those who were eligible and further get initiated on PrEP were female.

Table 4: PrEP Initiation as per Marital Status

| Initiate | Marital status | Total |
|----------|----------------|-------|
|          |                |       |

| Initiated on PrEP | Never Married | Cohabiting | Married Monogamous | Married Polygamous | Separated/Divorced | Widowed |     |
|-------------------|---------------|------------|--------------------|--------------------|--------------------|---------|-----|
| Yes               | 41            | 9          | 106                | 31                 | 3                  | 2       | 192 |
| No                | 127           | 2          | 74                 | 21                 | 2                  | 5       | 237 |
| Total             | 168           | 11         | 180                | 58                 | 5                  | 7       | 429 |

From the survey findings, it's evident that 39.16% (n=168) were never married, 2.6% were cohabiting, 42 percent were married monogamous, 13.52% were married polygamous, 1 percent had separated/divorced, and 1.6% were widowed. For those initiated on PrEP married monogamous took the largest proportion estimated at 55.21%, followed by the never married at 21.35%. Out of the number assessed to be eligible in each category, the cohabiting individuals ranked first for those who got initiated on PrEP for this group at a rate of 81.8% and initiation was least among the eligible in the never married category.

As evident from this finding, married monogamous got initiated on PrEP more which is contrary to findings of reported by AIDSMAP, for a previous survey which showed that the polygamous or divorced/widowed/separated had higher likelihood of starting PrEP (AIDSMAP, 2020). However, as per the report, the single individuals were less likely to be initiated on PrEP which has also been confirmed by this study's findings. For the divorced and widowed there representation was not satisfactory for this survey hence conclusive statements can't be made about uptake of PrEP.

Table 5: PrEP Initiation as per Population Type

| Initiated on PrEP | Population Type |     |     |            | Total |
|-------------------|-----------------|-----|-----|------------|-------|
|                   | General         | MSM | FSW | Discordant |       |
| Yes               | 73              | 2   | 4   | 113        | 192   |
| No                | 226             | 1   | 9   | 0          | 237   |
| Total             | 299             | 3   | 13  | 113        | 429   |

In regards to table 4.3 above, 69.7% of the individuals belonged to the general population, 26.3% were discordant, 3.3% were Female sex workers (FSW), and 0.70% were men who have sex with men (MSM). It is evident that majority of the eligible clients were in the general population set. Surprisingly, all individuals who were sero-discordant went ahead to get initiated on PrEP and only 24.41 percent of those found to be eligible in the general population got actually initiated on PrEP.

Table 6: PrEP Initiation as Per Entry Point

| Initiated on Prep | Point of Entry |     |      |     |     |       | Total |
|-------------------|----------------|-----|------|-----|-----|-------|-------|
|                   | CCC            | MCH | PEER | OPD | VCT | Other |       |
| Yes               | 114            | 32  | 5    | 4   | 29  | 8     | 192   |
| No                | 0              | 31  | 25   | 8   | 153 | 15    | 237   |
| Total             | 114            | 63  | 30   | 17  | 182 | 23    | 429   |

Table 4.5 above clearly depicts that the entry point for the majority of individuals surveyed was at the VCT which is approximately 42.4% followed by CCC at 26.6%. Other entry points recorded lower numbers with MCH having 14.7%, PEER 7.0%, and OPD 4.0%. Other entry points which included community outreaches recorded 5.4%.

#### 4.2. Probit Model Results and Interpretation

As a pre-requisite to estimating the probit model, individuals with missing variables were not included in order to ensure only complete data set was used. Beforehand, determination and subsequent setting of dummy variables was done. Age group 35-50 years was used as the benchmark. For gender, being male was considered the benchmark category. For marital status never married was used as a benchmark and for population type general population was chosen. In regards to the risk assessment findings, the presence of the risk was set the benchmark category. Having done the settings as intended for respective dummy variables, the output from the probit model set at 95% C.I was generated and findings presented in the table 7.

Table 7: Probit Model Results

| Parameter                      | Coefficient | Std. Error | z      | Sig.  |
|--------------------------------|-------------|------------|--------|-------|
| Age                            | .167        | .340       | .491   | 0.001 |
| Gender                         | -.948       | 1.497      | -.633  | 0.001 |
| Marital Status                 | .260        | .288       | .903   | 0.001 |
| Population type                | -.457       | .437       | -1.046 | 0.001 |
| HIV positive partner           | 2.148       | 1.424      | 1.508  | 0.009 |
| Sex partner of Unknown status  | -.287       | .735       | -.391  | 0.000 |
| Sex with >1 partner            | -.558       | .689       | -.811  | 0.712 |
| Ongoing IPV/GBV                | -.474       | 2.953      | -.161  | 0.425 |
| Transactional sex              | -2.061      | 1.760      | -1.171 | 0.009 |
| Recent STI                     | 1.116       | .949       | 1.176  | 0.003 |
| Sex under influence of Alcohol | .030        | 1.231      | .024   | 0.011 |
| No condom use                  | -.410       | 4.056      | -.101  | 0.001 |
| Entry Point                    | -.211       | 0.97       | .810   | 0.030 |
| Intercept                      | 3.137       | 4.451      | .705   | 0.001 |

a. PROBIT model:  $\text{PROBIT}(p) = \text{Intercept} + BX$

In regards to age, for every unit increase, there is increase in PrEP uptake by 0.167 units. The P value also depicts significance at 5% given that it's equal to 0.001. Older clients tend to get initiated on PrEP compared younger ones. This confirms results shared in the AIDSMAP report 2019 which outlined that study participants aged 15-25 years were worse with very high percentage not starting PrEP (45% less likely). These findings could be due to stigma concerns, and fear for side effects associated with PrEP use as earlier reported by a study done in China that found out that concern for PrEP side effects significantly contributed to low uptake (Liu, et al., 2018). A study by Koss *et.al* (2020) also demonstrated low uptake among individuals aged 15-24 years as well as 25-34 years which is similar to this study's findings.

Association between PrEP services uptake and gender show that there was statistically significant at 5% with a p value of 0.001. From the survey, the results show that male are less likely to get initiated on PrEP services as compared to their female counterpart. This could be attributed to perceived low risk among males as evident from earlier findings from a study conducted by Young, Flowers, & McDaid (2017).

In regards to marital status, every unit increase was associated with an increase by 0.260 units and at 5% this was found to be a statistically significant variable. Those who were never married were less likely to be initiated on PrEP. In regards to population type every unit increase was associated with a decrease by 0.457 in initiation. The general population were less likely to be initiated on PrEP. This variable was statistically significant given the p-value of 0.001. The results could be attributed to less perceived risk by the general population. Liu *et.al* (2018) pointed out perceived low risk status among clients was one of the main reasons individuals failed to start PrEP use. Koss *et.al* (2020) also found out that non-single status of marriage was associated to PrEP uptake and this is similar to findings from this study where the never married were unlikely to initiate PrEP use.

In regards to HIV risk status assessment findings for the individuals surveyed, it is evident that initiation on PrEP. For HIV Positive partner, every unit increase led to increase in PrEP use by to 2.148. This variable was also found significant at 5% given its P value equals to 0.009. These finding is similar to results from another study that showed high level of PrEP use among the

sero-discordant (Heffron, et al., 2018). Koss *et.al* (2020) study also demonstrated high PrEP use among individuals with HIV positive partners.

The findings also revealed that individual's sex partner status was unknown, they were likely to be initiated on PrEP since every unit increase leads to an increase in uptake by 0.287 units. There was also a statistically significant relation between the variable and PrEP services uptake at 5% as signified by P value of 0.000. This finding could be as a result of client's perception of high risk of getting infected with HIV and it resonates with Liu *et.al* (2018) finding which also indicated perceived high risk status as a main motivator to PrEP use.

Findings show that those with more than one sex partner were less likely to be initiated on PrEP given that every unit increase led to a drop in PrEP initiation by 0.558 units. The analysis indicated that the relation between PrEP services uptake and Sex with >1 sex partner at 5% wasn't statistically significant give the P value of 0.712. This finding could be associated with individuals not seeing this as a significant risk as well as stigma concerns that are associated with PrEP use. Perceived low risk has been found as a barrier to the utilization of PrEP by a study done in Scotland among communities (Young, Flowers, & McDaid, 2017) and this helps explain the findings in this study.

In regards to ongoing IPV/GBV, a unit increase results in a 0.410 decrease in PrEP utilization. It also was demonstrated that there was no statistically significant relation between PrEP services uptake and Ongoing IPV/GBV (P value, 0.425). The findings indicated that those who ongoing IPV/GBV were less likely to use PrEP services. This could be due participant's assumption that this factor doesn't put them at significant risk of getting infected with HIV. Perceived low risk has been cited as a barrier to PrEP use by Young, Flowers, & McDaid (2017).



It was also noted through the findings that those who practiced Transactional Sex were less likely to utilize PrEP services given that for every unit increase there was a decrease in PrEP initiation by 2.061 units. However, there was a statistically significant relation between PrEP services uptake and Transactional Sex (p-value, 0.009). Realized findings could be attributed to stigma concerns on PrEP use as earlier demonstrated by a study conducted by Liu *et.al* (2018) which found out stigma as a barrier utilization of PrEP.

Those with recent history of STI were likely to start using PrEP give every unit increase led to 1.116 unit increment in initiation on PrEP given It was also noted that there was statistically significant relation between PrEP services uptake and Recent STI given P value of 0.003. This could be attributed to the realization by the clients that presence of the STI increases their likelihood of getting HIV infection. Perceived high risk by clients is has been associated with high PrEP uptake as demonstrated by study done by Koss *et.al.* (2020).

The findings demonstrated that those with recurrent sex under influence of alcohol were likely to go get initiated on PrEP. The analysis further shows that there was statistically significant relation between PrEP services uptake and Recurrent Sex under Influence of alcohol (p-value 0.011). This is likely due to increased perceived risk of getting HIV infection as earlier demonstrated by a study done by Young, Flowers, & McDaid (2017).

Those who did not use condoms were less likely to be initiated on PrEP given every unit increase led to a decrease by 0.410 units in PrEP initiation. There was statistically significant relation between PrEP services uptake and those who do not use condoms at 5% given the p-value of 0.001. The findings could be attributed to clients not initiating PrEP due to other factors such as

fear, stigma, and concerns about side effects of PrEP use as evident from study done by Liu *et.al.* (2018), which cited low PrEP uptake to be due to concerns of side effects by participants.

In regards to client's entry points every unit increase led to a decrease in PrEP initiation by 0.211 units. At 5% this variable was found significant given p value of 0.000. Demonstrated results could be attributed to other factors such as primary service client is seeking at the facility and provider attitudes. The low uptake of this drug despite high sexual risk behaviors among the population being high was found by a study done earlier to be associated with lack of awareness among the general population, health workers attitude, treatment oversight and stigma in clinics and the community are the major key barriers (Kiplagat & Nancy 2018).

## **5. CHAPTER FIVE: DISCUSSION OF FINDINGS AND CONCLUSIONS**

### **5.0 Discussion of Findings.**

This study assessed the determinants of PrEP uptake in Ahero County Hospital by utilizing already available data for all clients eligible for PrEP and those who went ahead to get initiated on PrEP in the year 2019. Data was abstracted for a total of 429 clients.

Findings demonstrated that only approximately 45% of those who were eligible for PrEP got actually initiated on PrEP. The main factors that significantly influence PrEP use are: HIV

positive partner, no condom use, and partner(s) unknown HIV status. A high percentage of those eligible for PrEP was noted for the married monogamous category and those aged between 15-24 years which were estimated to be about 42% and 49.18% approximately. It was also noted that despite the high proportion of those eligible for PrEP in the age group of 15-24 years, only about 37 percent got started on PrEP. The VCT ranked first as clients' point of entry followed by CCC with rates of 42.4% and 26.6% respectively.

Results from analyses done demonstrated that there exists a significant relationship between clients' age, gender, point of entry, HIV positive status of partner, Unknown HIV status of partner(s), current STI, transactional sex, and having sex under the influence of alcohol. There was no significant association noted between ongoing IPV/GBV and prep use. The same was demonstrated in the case of having sex with more than one partner. It is evident that presence of risk influences one to use PrEP.

### **5.1 Conclusion and Policy Recommendations**

PrEP uptake still remains at low levels than expected with less than 50% of those found at risk of contracting HIV not going ahead to use PrEP. It is evident that the age group associated with high incidence of HIV i.e. 15-24 years are still recording low rates when it comes to PrEP initiation despite being the highest proportion of those at substantial risk. The entry points play a crucial role and entry points that capture the generation at most risk i.e. PEER centers as well as VCT be given more consideration being the point of entry most accessed by age set at most risk.

### **5.2 Study Limitations**

This study used secondary data and as a result of key variables missing for those who failed to take PrEP such as circumcision status and fertility intentions these variables had to be dropped from the model. The education status is limited to those who are 19 years and whether they attend school or not hence not applicable to the whole population hence this was also dropped from the model. The findings do not imply any causal relationships it being a cross-sectional study as well.

### **5.3 Recommendations for Further Research**

There is still much that has not been well understood in regards to PrEP use with the fact that the populations evident to being at significant risk still fail to take it up. Individuals aged 15-24 years were found to contribute a high percentage of those eligible for PrEP but a small percentage go

ahead to be initiated on PrEP(37%). The Findings here are also limited to just one facility hence need to do more large-scale researches on the same whose findings can then be better generalized to the whole population. There is need for in-depth qualitative studies that seek to answer questions on human sexual behavior and intentions on protecting themselves from contracting HIV by using preventive methods such as PrEP in order to find answers that cannot be derived from quantitative studies.

### References

- Aidoo-Frimpong, G., Wilson, K., & Przybyla, S. (2020). Factors influencing pre-exposure prophylaxis uptake among current users: A qualitative study. *Journal of HIV/AIDS & Social Services, 19*(3), 252-262.
- AIDSMAP. (2019). *How did Kenya build Africa's largest PrEP Programme?* Retrieved from AIDSMAP: PrEP programmes & uptake
- Amison, D. T., H, G., & S, H. (2017). *Disease Control Priorities: Improving Health and Reducing Poverty. 3rd edition.* Washington (DC): The International Bank for

Reconstruction and Development / The World Bank;. Retrieved July 9, 2021, from <https://www.ncbi.nlm.nih.gov/books/NBK525302/>

- Chunxing Liu 1, Y. D., Ning, Z., Gao, M., Liu, X., Wong, F. Y., & He, N. (2018). Factors influencing uptake of pre-exposure prophylaxis: some qualitative insights from an intervention study of men who have sex with men in China. *Sex Health, 15*(1), 39-45. doi:10.1071/SH17075
- Golub, S. A., Gamarel, K. E., Rendina, H. J., Surace, A., & Lelutiu-Weinberger, C. L. (2013). From Efficacy to Effectiveness: Facilitators and Barriers to PrEP Acceptability and Motivations for Adherence Among MSM and Transgender Women in New York City. *AIDS Patient Care and STDs*. doi:<https://doi.org/10.1089/apc.2012.0419>
- Heffron, R., Thomson, K., Celum, C., Haberer, J., Ngunjiri, K., Mugo, N., . . . Baeten, J. M. (2018). Fertility Intentions, Pregnancy, and Use of PrEP and ART for Safer Conception Among East African HIV Serodiscordant Couples. *AIDS Behavior, 22*(6), 1758-1765. doi:10.1007/s10461-017-1902-7
- Jackson-Gibson, M., Ezema, A. U., Orero, W., Were, I., Ohiomoba, R. O., Mbullo, P. O., & Hirschhorn, L. R. (2021). Facilitators and barriers to HIV pre-exposure prophylaxis (PrEP) uptake through a community-based intervention strategy among adolescent girls and young women in Seme Sub-County, Kisumu, Kenya. *BMC Public Health, 21*. Retrieved from <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-11335-1>
- Jackson-Gibson, M., Ezema, A. U., Orero, W., Were, I., Ohiomoba, R. O., Mbullo, P. O., & Hirschhorn, L. R. (2021). Facilitators and barriers to HIV pre-exposure prophylaxis (PrEP) uptake through a community-based intervention strategy among adolescent girls and young women in Seme Sub-County, Kisumu, Kenya. *BMC Public Health volume*. Retrieved from <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-11335-1>
- Jessica, P. R., Jessica, S., Eleanor, F., Michelle, T., Samantha, D., Moira, M., & David, P. (2020). HIV Care Continuum and COVID-19 Outcomes Among People Living with HIV

- During the COVID-19 Pandemic, Chicago, IL. *AIDS and Behaviour*, 2770–2772.  
doi:<https://doi.org/10.1007/s10461-020-02905-2>
- Koss, C. A., Charlebois, E. D., Ayieko, J., Kwarisiima, D., Kabami, J., & Balzer, L. B. (2020). Uptake, engagement, and adherence to pre-exposure prophylaxis offered after population HIV testing in rural Kenya and Uganda: 72-week interim analysis of observational data from the SEARCH study. *Lancet*. doi:[https://doi.org/10.1016/S2352-3018\(19\)30433-3](https://doi.org/10.1016/S2352-3018(19)30433-3)
- Liu, C., Ding, Y., Ning, Z., Gao, M., Liu, X., Wong, F. Y., & He, N. (2018). Factors influencing uptake of pre-exposure prophylaxis: some qualitative insights from an intervention study of men who have sex with men in China. *Sex Health*, 15(1), 39-45.
- Masyuko, S., A, L. I., Njathi, A. O., Kimani, B. M., Oluoch, A. P., Wamicwe, C. J., . . . Irungu, D. E. (2018). PrEP RollOut in a National Public Sector Program: The Kenyan Case Study. *Sex Health*, 15(6).
- McCormack, S. M., Nosedá, V., & Molina, J.-M. (2016). PrEP in Europe-Expectations, Opportunities and Barriers. *Journal of International AIDS Society*, 19(756), 21103.  
doi:PrEP programmes & uptake
- Muhumuza, R., Ssemata, A. S., Kakande, A., Ahmed, N., Atujuna, M., Nomvuyo, M., . . . Nematadzir, T. (2021). Exploring Perceived Barriers and Facilitators of PrEP Uptake among Young People in Uganda, Zimbabwe, and South Africa. *Archives of Sexual Behavior*, 50, 1729–1742.
- NASCOP. (2017). *Kenya PrEP Implementation Framework*.
- Olilo, W. A., Petersen, M. L., Koss, C. A., Wafula, E., Kwarisiima, D., Kadede, K., . . . Kanya, M. R. (2019). Pre-exposure Prophylaxis (PrEP) Uptake Among Older Individuals in Rural Western Kenya. *Journal of Acquired Immune Deficiency Syndrome*, 82(4).
- Patton, M. (1990). *Qualitative evaluation and research methods*,. Newbury Park, California: Sage Publications.
- Pillay, D., Stankevitz, K., Lanham, M., Ridgeway, K., Briedenhann, E., Jenkins, S., . . . Murire, M. (2020). Factors influencing uptake, continuation, and discontinuation of oral PrEP

among clients at sex worker and MSM facilities in South Africa. *PLoS One*, 14(4), e0228620. doi:10.1371/journal.pone.0228620

Reza-Paul, S., Lazarus, L., Presley, J., & Lorway, R. (2019, Dec 17). *Community Inclusion in PrEP Demonstration Projects: Lessons for Scaling Up*. Retrieved from Gates Open Research: <https://gatesopenresearch.org/articles/3-1504/v2>

Rosenstock, I. (1990). *The Health Belief Model: Explaining health behavior through expectancies*. San Francisco: Jossey-Bass Publishing.

UNAIDS. (2018). *Miles to go: closing gaps, breaking barriers, righting injustices*.

UNAIDS. (2021, February 24). *UNAIDS data 2018*. Retrieved from UNAIDS.ORG: <https://www.unaids.org/en/resources/documents/2018/unaid-data-2018>