

**FACTORS ASSOCIATED WITH FIRSTLINE TREATMENT FAILURE OF HIV  
POSITIVE CLIENTS ATTENDING MUBENDE  
HOSPITAL ART CLINIC**

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## **DECLARATION**

I hereby declare that this research is my original work and has never been submitted for any academic award to any institution or university. Due acknowledgement has been made for the work of others in this report through quotation and references.

Signature: .....

NAMBUYA JULIET

Date.....

## **APPROVAL**

This research report has been under my supervision and is ready for submission to the University with my approval as supervisor.

Signature:.....

MR. AFAYO ROBERT

Date:.....

## **DEDICATION**

This work is dedicated to my family, friends and the staff of Mubende Regional Referral Hospital.

First and foremost, I would like to praise and extend by sincere gratitude to the Almighty God for providing me the opportunity regarding my study and guiding me in all aspects during my stay at International Health Sciences University and throughout my life.

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## **OPERATIONAL DEFINITIONS**

### **Opportunistic infections**

These are conditions which come up (manifest) when one's immune system has been suppressed. Due to chronic conditions (diseases like HIV/AIDS) these conditions include Herpes Zoster, Tuberculosis (pulmonary and extra pulmonary), skin manifestations like Puritic purpular eruption kaposi's sarcoma etc

### **Adherence**

This is the ability of an individual to comply to the guidelines given to him or her in relation to his or her medication. This is swallowing one's medication by the right person with the right dose at the right time.

### **Treatment failure**

This is the suboptimal response or the lack of a sustained response to ART, which can be determined using clinical, immunologic or virologic criteria, either singly or in concert

### **Virological failure**

This is a state when one has a persistent viral load higher than 5,000 RNA copies per ml after at least 24 weeks on ART, in a treatment-adherent client.

## ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
ART	Anti Retroviral Therapy
ARV	Anti Retro Virus
CD4	Cluster of Differentiation
DAART	Directly Administered Anti-Retroviral Therapy
DHO	District Health Officer
HAART	Highly Active Anti-retroviral Therapy
HIV	Human Immunodeficiency Virus
MARP	Most At Risk Population
M.O.H	Ministry of Health
NVP	Niverapine
PMTCT	Prevention of Mother TO Child Transmission of HIV
WHO	World Health Organization

## ABSTRACT

**Introduction:**The case control study was conducted using a convenience method conducted at Mubende enrolled was conducted 246 participants 123 participants who had failed on first line(cases) and 123 who had not failed on first line(controls).A supplied convenience method was used. The objectives were:To determine the socio demographic, clinical and personal factors associated with failure of first line ART among the positive clients attending Mubende ART clinic.

**Results:** Majority of the variables were significantly associated with first line treatment failure as reported. Majority of the clients who participated were between 36-45 years(35.8%) while a few who were between 18-25 years (14.2%)failed. Many of the participants who failed were female (54%) and also a big number were widowed (37%).. Participants who did not have formal education are identified to have failed (43.9%).

Those who are civil servants (36.6%) were identified to have failed more than other categories. Those clients who were earning more than one hundred thousand shillings (54.2%) were identified to have failed more than those who earn a monthly income less than 100000/= Area of residence, gender age, monthly income, occupation and marital status were highly associated with failing on first line drugs ( $p < 0.05$ ).

Clinical factors were all significantly associated with treatment failure these included :baseline cd4( $p < 0.001$ ),distance from clients homes( $p < 0.001$ ),duration on ART( $p < 0.001$ ),WHO stage( $p < 0.001$ ),.apart from clinic waiting time( $p = 0.004$ ) and NVP exposure( $p = 0.540$ ) and drug availability at the site( $p = 0.086$ ). and the Personal factors were all significantly associated with first line treatment failure apart from community support groups availability ( $p = 0.883$ )

**Recommendations:** The Government should put more funding in drug procurement so that there is the strategy of test and treat is initiated this will help to reduce on the HIV transmission rates, reduce on morbidity and mortality rates due to HIV, early initiation will help to improve client s health and hence prolonged stay on first line etc. In conclusion there are many factors that bring about first line treatment failure there for the government should strengthen the comprehensive HI care and management system.

## **CHAPTER ONE: INTRODUCTION**

### **1.0 Introduction**

This chapter presents the introduction and background of first line treatment failure among HIV positive patients as well as the problem statement, purpose of the study, objectives, research questions, significance of the study and conceptual framework.

### **1.1 Background of the study**

The global AIDS epidemic report shows that 35 million people were living with HIV/AIDS by 2013. It resulted into 1.34 million deaths in 2013. Of these 70% that is 24.7 million people live in sub-Saharan Africa. Children living with HIV/AIDS were 3.2 million. People who were newly infected with HIV in 2013 were 2.5 million people and those who died of HIV/AIDS were 1.5 million (UNAIDS 2013). In sub Saharan Africa it is estimated that 30 million people are living with HIV/AIDS.

Treatment failure is the inability to achieve a viral load below assay detection limits (<50 copies/mL) or as any sustained return of the viral load to above the target value (>40copies/mL) this depends on the clinical setting (Bangsberg, 2010). The HIV virus also resists some antiretroviral drug resulting into treatment failure which is called virological failure. And clinical failure is a situation when the client who is already on ART starts getting opportunistic infections like Tuberculosis, Cryptococcal Meningitis, Herpes zoster etc.

The Antiretroviral drugs have helped in the reduction in the morbidity and mortality of those who are infected with HIV. This has been through proper distribution of antiretroviral drugs countrywide up to the grass root i.e. Health Centre's III. But it has been noted that many clients are failing on first line treatment due to many different reasons this has mainly been identified after doing a viral load test which measures the amount of the virus in one's blood per ml (MRRH ART report, 2014).

Globally, WHO (2014) reported that although recent estimates suggest only 2% of those currently on ART are on a second-line regimen, a far greater number are likely to be failing virologically but have not been switched from first-line therapy: WHO estimates that 500,000 to 800,000 patients required switching to second-line regimens by 2010. This is due to various factors including poor access and unavailability of ARVs, monthly income, ART duration, and poor adherence among many other factors.

In Sub Saharan Africa, as ART scale-up continues and the average duration on ART increases, both the absolute number and relative proportion of patients needing second-line therapy continues to grow. It has previously been estimated in South Africa that by 5 years on ART, 14% of patients fail virologically (Keiser, Tweya and Boulle, 2009).

In East Africa, Hassan et al (2014) reported that in Kenya approximately 10,000 HIV-infected individuals were on ART in 2003. By the end of 2011, more than 400,000 individuals had been initiated on ART in the country. However, the increase in the number of people with access to ART has resulted in substantial declines in HIV related incidence, morbidity and mortality. However, emerging HIV-drug resistance and subsequent treatment failure threatens to reverse these gains and many HIV positive patients face first line treatment failure and this is attributed to various factors including drug intolerance, being fed up with the medication among other factors.

Similarly, Byakika-Tusiime and Kiguba, (2007) report that in Uganda, failure of first line treatment among HIV positive clients was prevalent and this was attributed to various factors including fear of unpleasant drug side effects including confusion and forgetfulness. Furthermore, in Uganda 1.7 million were infected with HIV and the HIV prevalence was at 7.3 %, 184000 were children and 55% were women (M.O.H, 2013).

Mubende district has a prevalence of 30% and Mubende Regional Referral Hospital had a total of 4520 clients of these 250 are on second line after failing on first line due to different reasons (Mubende ART Clinic report, 2014). However, the particular factors associated with first line treatment failure among these patients are unknown, hence the need for the study to identify these factors.

## **1.2 Problem Statement**

The WHO recommends that all those who test HIV positive with either a CD4 <500 cells or those in clinical stage 3 and 4, all be started on antiretroviral drugs. Other groups to be started on first line treatment include: Vulnerable groups which include pregnant women, children below 15 years and the Most At Risk Populations (MARPs) be started on ARVs and health service providers have implemented this in the Mubende hospital ART clinic.

WHO (2014) also recommends 95% adherence to cocktail of ARV regimen to achieve the maximum therapeutic benefit. However, it has been noted that some clients due to different reasons do fail on the drugs after swallowing them for some period which period differ from individual to individual.

DHO's office (Mubende) report of Dec 2014 showed that many people are failing and more are expected to fail by 2020 because using the viral load as the gold standard way of determining treatment failure in clients on ART. Mubende regional Referral Hospital reported that of the 3520 on first line ART regimen 310 have failed and have been switched to second line. 75 were identified through clinical criteria and immunological criteria. Making a total of 385 adult clients who had failed on first line ART treatment regimen in a period of 6 years. This was at 14%. Those who fail will become bed ridden leading to increase in morbidity and mortality rates while there will be an increase in the resistant strain which will be spread to the people in the community, long stay in hospitals and reduction in productivity. The other health facilities within the district which give out ARVs have a total of 1231 adults on first line and a total of 92 on second line making a percentage of 7.5% in a period of 2 years. However, the particular factors associated with first line treatment failure of HIV positive clients attending Mubende Hospital ART Clinic are not known; hence this study was carried out to identify them in an effort to come up with interventions to maintain clients and improve clients on first line treatment.

## **1.3 General Objective**

Generally, the study aimed at determining the factors associated with first line treatment failure of HIV positive clients attending Mubende Hospital ART clinic.



#### **1.4 Specific Objectives**

The study was guided by the following objectives:

1. 1To determine the socio demographic factors associated with failure of first line ART among the positive clients attending Mubende ART clinic.
2. 2To identify the clinical factors associated with failure of first line ART among HIV positive clients attending Mubende ART clinic.
3. 3To establish the personal factors associated with first line treatment failure among clients attending Mubende ART clinic.

#### **1.5 Research Questions**

Answers were sought to the following questions;

- 1) What are the socio demographic factors associated with failure of first line ART among the positive clients attending Mubende ART clinic?
- 2) Which clinical factors are associated with failure of first line ART among HIV positive clients attending Mubende ART clinic?
- 3) What personal factors are associated with first line treatment failure among clients attending Mubende ART clinic?

#### **1.6 Significance of the study**

The following significance is anticipated;

The research findings may provide a framework for better understanding of the particular factors associated with first line treatment failure among clients. It may also enhance health workers' interventions to address these factors.

The research study may assist concerned ministries and organizations in developing sensitization and health education programs about the importance of ensuring maximum adherence to medication among HIV positive patients.

The results from this study will provide a valuable reference point for future studies on this issue and also contribute to the available literature about the factors associated with first line treatment failure among HIV positive patients.

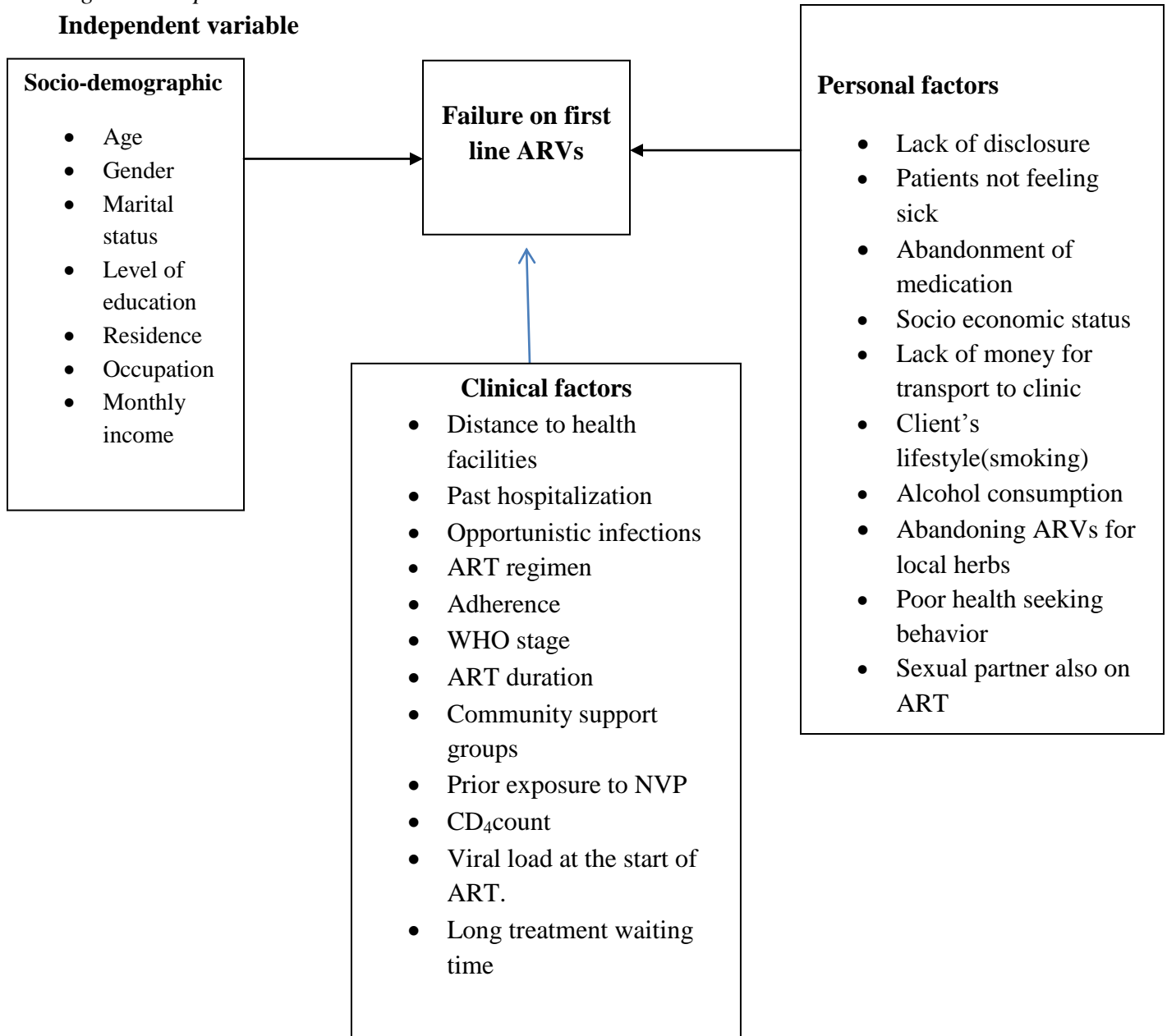
The study will help the nurses doing clinical work in HIV care to know that some clients whose cd4 test results don't raise that they may be having a resistant strain so its important to do viral load or even a resistant test.

The study findings will help Mubende regional Referral Hospital to review its method of drug procurement to avoid stock outs resulting into missed doses which results into treatment failure

## 1.6 conceptual framework

Fig. 1 Conceptual Framework

### Independent variable



Source: Primary data

## **Summary**

From the conceptual framework described above, it can be witnessed that clients' failure on first line ARVs is a result of various factors including socio demographic, personal and clinical factors associated with failure of first line ARVs. Among these include age, gender, level of education, lack of disclosure, client's lifestyle, failure to ensure adequate nutrition and alcohol consumption were some of the factors. ART duration, lack of clear instructions for administration, stock outs of ARVs, long distance to health facility, long patient waiting time, lack of supervision and follow up by health workers were some of the other factors.

Majority of the factors associated with first line treatment failure are clinical meaning institutional causes and human resources (health care workers so the government has to strengthen the health systems in relation to HIV/AIDS care and management.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.0 Introduction**

This chapter presents literature reviewed and publications in relation with the specific objectives of the study including the socio-demographic, clinical and personal factors associated with first line treatment failure of HIV positive clients. The literature is presented beginning with the socio – demographic factors associated with first line treatment failure.

### **2.1 Socio-demographic factors associated with first line treatment failure of HIV positive clients**

Bachmann (2006) mention in case control study about the effectiveness and cost effectiveness of early and late prevention of HIV/AIDS progression with Antiretrovirals or antibiotics in Southern African adults that some of the socio demographic factors associated with first line treatment failure of HIV positive clients include the age and sex of the client. This was true as younger patients may not know/appreciate the reason for taking daily tablets and hence abandon the medication, leading to treatment failure.

A cross sectional study about psychological distress and adherence to Highly Active Anti-Retroviral Therapy (HAART) in Uganda was carried out by Nakimuli-Mpungu et al (2009) one hundred twenty-two HIV positive adult individuals receiving care from an Urban HIV clinic were enrolled in the study. Participants were screened for psychological distress with the Self Report Questionnaire (SRQ-20). Adherence was assessed using the self-report method. Multivariate logistic regression analysis was used to determine whether psychological distress is a risk factor for non-adherence to HAART adjusting for various socio-demographic and clinical

factors. Psychological distress and living in isolation were significantly associated with non-adherence to HAART and treatment failure after adjusting for other demographic and clinical variables [OR=3.66, 95%CI (1.39-9.78) and OR=9.80, 95%CI (2.27 - 18.70)] respectively. Among HIV positive individuals who were receiving additional treatment for a mental disorder, psychological distress was not significantly associated with non-adherence to HAART [OR=1.25, 95%CI (0.30 - 5.20)]. The study revealed that some of the socio demographic factors associated with first line treatment failure of HIV positive clients include the educational level of clients. It was further noted that clients who had little or no education were more likely to default their treatment as they may not be adequately aware of the dangers of poor adherence. This was true as level of education influenced awareness about the importance of adherence to medication or the dangers of not adhering to medication.

Sabaté (2005) reports in a cohort study about adherence to long term therapies that some of the factors associated with first line treatment failure of HIV positive clients include the residence of respondents. It was further revealed that HIV positive clients residing in urban areas were highly more likely to have poor adherence to ARVs and hence first line treatment failure due to various factors including client's life style as they smoke, buy commercial sex workers, among other factors. This is also related to this study as some of the clients reside very far more than 10 km to the clinic.

## **2.2 Clinical factors associated with first line treatment failure of HIV positive clients**

Byakika-Tusiime, et al. (2007) reveal in a cohort study about the discontinuation and modification of highly active antiretroviral therapy in HIV-infected Ugandans, including prevalence and associated factors, that some of the clinical factors associated with first line treatment failure of HIV positive clients include long distance to the health facility, whereby patients sometimes failed to get their medication on time due to the distance to the health facility. Other factors include CD4 level at start of ART as well as Viral load at start of ART among others. This was true as long distance to the health facility could most times lead to failure to fetch medication, leading to poor adherence and hence treatment failure. Our objective was to

determine the level of adherence and reasons for non-adherence to antiretroviral therapy (ART) among HIV-positive (HIV+) people on ART in a resource-limited setting.

Patients receiving ART were recruited into the cross-sectional study from three treatment Centres in Kampala, Uganda. The number of missed doses over the last three days was assessed by structured patient interviews and dichotomized at +/-95% adherence. Reasons for non-adherence were assessed with both structured patient interviews and unstructured qualitative interviews. Independent predictors of non-adherence were assessed with multivariate logistic regression. In all, 304 HIV-infected persons on ART were enrolled into the study. Factors associated with non-adherence were marital status (odds ratio (OR) = 2.93, 95% confidence interval (CI) 1.32-6.50) and low monthly income <50 US\$ [OR = 2.77, 95% CI 1.64-4.67]. We concluded that levels of self-reported adherence in patients receiving ART in Kampala are comparable to levels in resource-rich settings with inability to purchase and secure a stable supply as a major barrier to adherence and failure of first line treatment.

Similarly, Hogan and Salomon (2005) in their case control study about the prevention and treatment of human immunodeficiency virus/acquired immunodeficiency syndrome in resource-limited settings, findings showed that a clinical factor associated with first line treatment failure of HIV positive patients included frequent stock outs of all necessary medications at the local health facilities, leading to failure to adhere to the ARVs. This was indeed very true since unavailability of medication led directly to missed doses which highly contributed to treatment failure. Strategies for confronting the epidemic of human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) have included a range of different approaches that focus on prevention and treatment. However, debate persists over what levels of emphasis are appropriate for the different components of the global response. The study also reviewed the experience with antiretroviral therapy to date in terms of response rates and survival rates, adherence, drug resistance, behavioral change and epidemiological impact and first line treatment failure.

A Cross sectional study about the cost-effectiveness and cost evidence for HIV/AIDS care and treatment in resource constrained settings, where 243 HIV patients were surveyed, findings revealed that past hospitalization, opportunistic infections and ART regimen (NVP, EFV) and

lack of viral load screening services were also associated with first line treatment failure (DeMaria et al, 2008).

Galarraga and Colchero (2009) state in a cross section study about HIV prevention cost-effectiveness, findings showed that important clinical factors associated with first line treatment failure is the inability of health staffs to adequately explain to clients the real and perceived effects of the medication and thus help patients alleviate any fears they held about the medication which would have led to non-adherence. Other factors identified included WHO stage, TB treatment and ART duration whereby due to the lifelong taking of ARVs, clients got fed up and abandoned the medication, hence leading to first line treatment failure.

We obtained output and economic cost data for the 2005-2006 fiscal years from a representative sample of 128 public-funded HIV prevention programs of 14 types in Andhra Pradesh state of India. Using data from various sources, a model was developed to determine rates of treatment failure. Results showed that a major clinical factor associated with first line treatment failure among HIV positive patients included lack of clear instructions for administration, and very long waiting time spent waiting to receive services whereby some patients left without picking up the medication. This was true as lack of clear guidelines/instructions on how to take the medication potentially led to poor practices in taking the medication and this led to failure of first line treatment (Dandona and Kumar, 2009).

A cross sectional study among 1,729 patients using Markov modeling to calculate lifetime costs, LYs and QALYs and uncertainty was assessed through probabilistic sensitivity analysis on all utilization and outcome variables revealed that showed that some of the factors associated with first line treatment failure among HIV positive patients included prior exposure to NVP, poor adherence, lack of supervision and follow up by health workers, unavailability of community support groups to PLWHIV among other factors (Cleary and McIntyre, 2006).

### **2.3 Personal factors associated with first line treatment failure of HIV positive clients**

Sabaté (2005), in his study about the adherence to long term therapies and evidence for action, where 167 subjects were surveyed, findings reveal that a major factor associated with first line treatment failure is non-adherence to ARVs due to patients not feeling sick. Analysis showed



that patients tended to abandon their medication when they did not feel ill. Others included having reinfections, substance abuse and poor timing of drug intake.

Another study by Burnett et al, (2005) about Hepatitis B virus and human immunodeficiency virus co-infection in sub-Saharan Africa, where 210 subjects were surveyed reported that the major factors associated with failure of first line treatment include abandonment of medication due to forgetfulness, and having no or few symptoms, while the minority stated that they just gave up on the medication because their illness was chronic and they would not be able to cure it no matter the medication they took. This was true as patients who suffered from chronic and long term illnesses at times abandoned their medication after getting fed up and this led to first line treatment failure.

In a case control study conducted by Matare, 2015 in Zimbabwe there is a similarity with this study in that the same number of cases and controls of 123 cases and 123 controls were recruited into the study. The findings illustrated socio-demographic characteristics of study participants that were statistically comparable in terms of socio-demographic characteristics except on employment where cases were more likely to be unemployed.

Associated with first line HIV treatment failure in Significant risk factors associated with first line HIV treatment failure were baseline CD4 Count of  $<100 \text{ cells/mm}^3$  (OR=2.82, CI 1.68-4.74), Significant protective factors were disclosure of HIV status (OR=0.34, CI 0.14-0.80), receiving at least one individual counseling on ART (OR=0.35, CI 0.18-0.69)

The risk factors for first line HIV treatment failure is associated with first line HIV treatment failure were poor adherence to ART (<80% adherence) and baseline WHO Stage 3 or 4

In a case control study about the effectiveness and cost-effectiveness of strategies to expand antiretroviral therapy in St. Petersburg, Russia, where 300 HIV patients aged 15 – 49 years were surveyed, a dynamic HIV epidemic model was developed for a population of IDUs and non-IDUs. The location for the study was St. Petersburg, Russia. The adult population aged 15 to 49 years was subdivided on the basis of injection drug use and HIV status. HIV treatment targeted to IDUs and non-IDUs, and untargeted treatment interventions were considered. Health care costs and quality-adjusted life years (QALYs) experienced in the population were measured, and

HIV prevalence, HIV infections averted, and incremental cost-effectiveness ratios of different HAART strategies were calculated. With no incremental HAART programs, HIV prevalence reached 64% among IDUs and 1.7% among non-IDUs after 20 years.

The results were sensitive to HIV transmission parameters. Results showed that some of the factors associated with failure of first line treatment failure are the inability to ensure a consistent supply of ARVs as recommended. It was noted that the socio economic status of clients and their families, whereby they may sometimes not take the medication because they lack the money to purchase it often led to drug resistance and hence treatment failure (Long et al, 2006). This was true especially in societies where ARVs were not subsidized. This is also related to this study in that Uganda is a low income country so it has to wait for drugs from the donors which at times take long to get into the country resulting into clients going without drugs resulting into treatment failure of clients on first line.

Bartlett and Gallant (2005) report in a study about the medical management of HIV infection that some of the factors associated with failure of first line treatment included the client's lifestyle. It was noted that practices such as failure to ensure adequate nutrition, especially with vegetable, fruit and mineral rich diets as well as alcohol consumption all negatively affected the efficacy of the medication, making it highly likely that someone will experience treatment failure.

Katabira et al, (2005) reveal in a study about adherence to HIV anti-retroviral therapy in HIV+ Ugandan patients purchasing therapy that some of the factors associated with first line treatment failure among clients include non-adherence to the given dosage and clients giving up on the condition. It was further noted that abandoning ARVs in favor of local herbs, which is prevalent in many rural and urban settings all increased the risk of first line treatment failure. This was true due to the prevalent cultural preference and promotion of local herbs for treating illnesses. However, it directly led to abandonment of ARVs and hence treatment failure.

However, Sarna et al, (2005) document in their cohort study about promoting adherence to antiretroviral therapy through a directly administered antiretroviral therapy (DAART) strategy in Mombasa Kenya among 234 HIV-infected, treatment-naïve patients who initiated highly active anti retro-viral therapy (HAART), results revealed that some of the factors associated with first line treatment failure include failure to disclose HIV status to significant others, hence

Potentially missing out on any support and encouragement to stick to the medication. Furthermore, poor health seeking behavior, physical difficulty in complying (e.g. opening medicine containers, handling small tablets, swallowing difficulties, travelling to place of treatment), which may sometimes be due to the severity of the illness as well as unattractive formulation, such as unpleasant taste were some of the other factors identified. The results presented were true as these factors had also been noted by other studies to contribute to first line treatment failure.

Habib O (2014) noted that some of the clients fail first line ARV due to social economic factors this is in relation to this study because majority of the clients are peasant farmers who grow mainly maize for both commercial and domestic use. This is a seasonal venture whereby they are 2 seasons a year so this means these clients will spend month without money even to buy the basic necessities. This will result into failure to raise money for transportation to the health facility to pick their medications and doing cd4 cell counts.

## **CHAPTER THREE: METHODOLOGY**

### **3.0 Introduction**

The chapter describes the practical procedures for carrying out the study. It gives details of the research methods to be adopted, including the research design, study population, sampling procedure, sample size, data sources, data collection methods, data processing, data analysis and presentation of findings as well as ethical considerations.

### **3.1 Study Design**

The study was a case control study where by clients in the ART clinic of Mubende Regional Referral Hospital were the participants. A case control study was chosen because it was easy, quick, generally required a few study subjects and it is used to study multiple risk factors

### **3.2 Source of Data**

Data was collected from the primary sources.

#### **3.2.1 Primary sources of data**

Primary data was collected using interview guides from HIV patients attending services at ART clinic, Mubende Regional Referral Hospital. This enabled them to reveal the various factors associated with first line treatment failure of HIV positive clients attending ART clinic.

### **3.3 Population**

The study population was comprised of male and female adult HIV Positive clients attending ART clinic at Mubende Regional Referral Hospital, Mubende District.

Target population: All HIV positive clients in Mubende district

Accessible population: This constituted of all HIV positive clients who have been on

## Antiretroviral drugs at Mubende Regional Referral Hospital

Study population: All the HIV positive clients who met the inclusion criteria and consented to participate in this study.

### 3.4 Sample size Estimation

The study included a sample of 246 respondents who attended ART clinic at Mubende Regional Referral Hospital, of which 123 participants were already on second line for ART and 123 clients were on first line for 5 years and above. This sample size was presumed representative enough of the entire study population. The sample size was got using Matare et al (2015) as demonstrated below;

$$N = \frac{\binom{r+1}{r} (P)(1-P) (Z_{1-\beta} + Z_{\alpha/2})^2}{(P_1 + P_2)^2}$$

For 80% power

$$Z_{1-\beta} = 0.8416$$

For 0.05 level of significance  $Z_{\alpha/2} = 1.96$

$$r = 1$$

$P_2$  = Proportion of population exposed in control group

$P_1$  = Proportion of population exposed in case group

$$P_1 = \frac{OR \cdot P_2}{P_2(OR-1)+1}$$

$$P = (P_1 + P_2) / 2$$

$P_2 = 80\%$ ,  $OR = 1.58$  (Matare, 2015)

$$P_1 = \frac{5.14 \cdot 0.8}{0.8(5.14-1)+1} \quad P_1 = \frac{5.14 \cdot 0.8}{(0.8 \cdot 4.14)+1} = 0.954$$

$$P = (0.8 + 0.954) / 2 = 0.877$$

$$n = \frac{2(0.877)(1-0.877)(0.8416+1.96)^2}{(0.8-0.954)^2} = 122.6$$

n= 123

Sampled population in case group was 123

### **3.5 Eligibility criteria**

#### **Cases:**

Adult clients on second line ART who were switched to second line before 2015

Clients on second.

#### **Controls:**

Adult clients who had taken ARV's for more than five years and were still on first line

### **3.6 Sampling Technique**

Consecutive sampling technique was used to select the cases and the controls until when the required sample size was achieved. Here the research assistant picked the clients who attended clinic on a particular day and separated those on second line and those on first line. They also considered the duration on ART. Then put them in the 2 different arms.

### **3.7 Study variables**

#### **3.7.1 The independent variables**

The independent variables included the socio demographical: Age, Gender, marital status, level of education, residence, occupation and monthly income. The clinical factors included: distance to health facility, opportunistic infections, ART regimen, WHO clinical stage, Prior ART Exposure, CD4 count, ART duration.

The personal factors included lack of transport, abandonment of medications, poor health seeking behaviors, Alcohol consumption, and patient not feeling well.

### **3.7.2 Dependent variables**

The dependent variable was first line treatment failure which is defined as the inability to achieve a viral load below assay detection limits (<50 copies/mL) or as any sustained return of the viral load to above the target value. Using the first line antiretroviral drugs.

### **3.8 Data collection method**

The researcher used closed ended self-administered questionnaires.

Two research assistants were trained by going through the questioner and telling them what is expected from them in order to identify the participants and administer the questioner in that after getting written permission from the Mubende Rehabilitation Centre clinic head, we went to the data office with a letter permitting us to carry out pre testing of the questioner. A list of clients was generated who have been on ART for the last 5 years and above and those who are on second line. A total of 12 participants were got (6 cases and 6 controls). This was conducted at Mubende Rehabilitation Centre (Barracks) ART clinic.

Pre testing of the questioner was done to identify the different errors made and to get proper meaning of what the factors that contribute to first line treatment failure. After this the errors were corrected and the changes which were identified were made.

The data collection at Mubende Rehabilitation Centre was done on the ART clinic day where the identified participants were called from their homes as they stay within the barracks and they were all available. The participants gathered and they were first addressed about the study and why it was conducted the participants were also informed about the study being for academic purpose and all information collected as it was to be kept confidential. Then the researcher welcomed questions from the participants which were answered and later the research assistant's one handled those on second line and the other handled those on first line ARVs by asking them questions one by one according to the questioner. They also referred to the clients files as some clients could not remember when they were initiated on ART and their baseline CD4s at baseline was unknown. A total of 12 clients participated 6 cases and 6 controls.

### **3.9 Data management**

The researcher trained 2 research assistants whom she supervised and provided a comprehensive overview of the topic under study. Confidentiality was paramount. Here codes were used instead of the client's names. Data was collected by the use of semi-structured, self-administered interview guides. Interview guides were designed for the respondents and compiled by the researcher with the assistance of the supervisor. The researcher use both open and close ended questions. The questionnaires were filled and later checked for completeness and accuracy. The data was then analyzed using SPSS computer program. Data cleaning was done and then data was backed up on an external drive and on a CD.

### **3.10 Data Analysis plan**

Data was entered into SPSS version 20 for data analysis after which the analyzed data was transferred to Microsoft Excel version 2010 for presentation of results in tables.

### **3.11 Quality Control of data**

Prior to data collection, the tool were pretested among 12 clients attending ART clinic at another hospital to allow the researcher to determine the accuracy and reliability of the tool, necessary changes were made before using it for data collection.

### **3.12 Ethical consideration**

The researcher got approval from the university research committee where a supervisor was allocated to the researcher then permission from the administration of Mubende Regional Referral Hospital to enable data collection from the area. This was preceded by a letter of introduction from the Dean's office as pre-requisite for carrying out the study. The consent of the respondents were obtained after the purpose and objectives of the study were identified and well explained to the respondents. The study intended purely to be for academic purposes and all the information given was treated with confidentiality and numbers instead of names were used to identify the respondents.



### **3.13 Dissemination of findings**

After completion of the study, the findings were compiled and 5 copies of the report will be disseminated as follows:

- Two copies will be given to IHSU
- A copy will be given to Mubende Regional Referral Hospital
- The supervisor
- The researcher

## CHAPTER FOUR: DATA PRESENTATION AND ANALYSIS

### 4.0 Introduction

This chapter represents results that were analyzed from the data collected from 123 cases and 123 controls using semi - structured questionnaires. The purpose of the study was to identify factors associated with first line treatment failure. Results are summarized and presented according to the study objectives.

### 4.1 Socio- demographic Characteristics

*Table 1: Socio-demographic Characteristics of clients on ART attending Mubende RRH*

Variable	Category	overall(N)	Percent
Age (years)	18-25	35	14.2
	26-35	72	29.3
	36-45	88	35.8
	46 and above	51	20.7
Marital status	Single	22	8.9
	Married	76	30.9
	Divorced	57	23.2
	Widowed	91	37.0
Education level	None	108	43.9
	Primary	91	37.0
	Secondary	24	9.8
	Tertiary	23	9.4
Occupation	Unemployed	41	16.8
	Self employed	15	6.1
	Civil servant	90	36.6
	others	100	41
Monthly income	≤100,000	117	47.6
	>100,000	129	52.4

The study looked at key socio-demographic characteristics like age, marital status, Educational level, occupation and monthly income. According to study findings shown in table:1, most of the clients who were interviewed were aged between 36-45,35.8% (88/246).,78.5 % ( 91/246) were widowed, most of them are female 54% ( 133/246). Those who had no formal education, lastly 43.9% had income level of  $\leq$ 100,000 shillings Per month.

#### **4.2 Social demographic factors associated with first line treatment failure**

Factors which included Age, gender, marital status, occupation and monthly income were noted to be strongly associated with first line treatment failure of clients on at attending Mubende ART clinic. This was as shown in the table below.

Table 2: Socio-demographic factors associated with failure on first line ARV drugs

Socio-demographic characteristics		Overall 100%	Cases n=123(50%)	Controls n=123(50%)	P value
<b>Age</b>	18-25	35(14.2)	20(16)	15(12)	<0.001
	26-35	72(29.3)	33(27)	39(32)	
	36-45	88(35.8)	65(53)	19(15)	
	46yrs +	51(20.7)	5(4)	46(37)	
<b>Gender</b>	Male	113(46)	81(66)	32(26)	<0.001
	Female	133(54)	42(34)	91(74)	
<b>Marital status</b>					<0.001
Single		22(8.9)	12(10)	10(8)	
Married/cohabiting		76(30.9)	58(47)	18(15)	
Divorced/separated		57(23.2)	19(15)	38(31)	
Widow/widower		91(37.0)	34(28)	57	
<b>Education level</b>					0.098
No formal education		108(43.9)	48(39)	60(49)	
Primary		91(37.0)	51(41)	40(33)	
Secondary		24(9.8)	9(7)	15(12)	
Tertiary		23(9.4)	15(12)	8(7)	
<b>Ocupatiuon</b>					<0.001
Not employed/house wife		41(16.8)	20(8)	31(25)	
Self employed		15(6.1)	10(8)	5(4)	
Civil servant/professional		90(36.6)	68(55)	22(18)	
Unemployed		17(6.9)	14(11)	3(2)	
Others		83(33.7)	21(17)	62(50)	
<b>Monthly income</b>					<0.001
≤=100,000		117(47.6)	43(35)	74(60)	
≥=100,000		129(52.4)	80(65)	49(40)	
<b>Area of residence</b>					0.002
Urban		145(47.2)	71(58)	13(11)	
Semi urban		63(20.5)	15(12)	48(39)	
Rural		99(32.3)	37(30)	62(50)	

At bivariate analysis among the social demographic factors studied, Education levels( $p=0.098$ )was identified as the only factor which was found not to be associated with failure on first line ARV drug treatment as indicated in table 2

#### **4.3 Qualitative analysis**

Majority of the client reported that some of the causes of treatment failure results from forgetting to swallow their medications this is probably related to lack of disclosure because when you don't disclose no one will remind you to swallow your medications .hence resulting into treatment failure.

#### **4.4 Clinical factors associated with first line treatment failure**

It was discovered that there are many significant clinical factors resulting into treatment failure these include baseline cd4 if it was low( below 100cells) chances of failing are high, distance from home, duration on ART,WHO clinical staging and a history of hospitalization these significantly have an impact on clients failure on first line ARVs in Mubende.

Table 3: Clinical factors associated with failure on first line ARV drug

<b>Clinical factors</b>	<b>Overall 100%</b>	<b>Cases n=123(50%)</b>	<b>Controls n=123(50%)</b>	<b>P value</b>
<b>Baseline cd4</b>				
≥100	119(48.4)	40(33)	79(64)	<0.001
≤100	127(51.6)	83(67)	44(36)	
<b>Clinic waiting time</b>				0.004
2 hours	50(20.3)	30(24)	20(16)	
3-4hours	163(66.3)	85(69)	78(63)	
5-7 hours	33(13.4)	8(7)	25(20)	
<b>NVP exposure</b>				0.540
Yes	11(4.5)	7(6)	4(3)	
No	235(95.5)	116(94)	119(97)	
<b>Distance from home</b>				<0.001
Less than 5km	103(41.9)	80(65)	23(19)	
5-9	55(22.4)	13(11)	42(34)	
More than 10km	88(35.8)	30(24)	58(47)	
<b>Months on ART</b>				<0.001
24-48	47(19.1)	47(38)	00(0)	
49-73	50(20.3)	40(33)	10(8)	
74-98	80(32.5)	30(24)	50(41)	
99-123	60(24.4)	6(5)	54(44)	
124≥ 00	9(3.7)	0(0)	9(7)	
<b>WHO Stage at baseline</b>				<0.001
1	61(24.8)	19(15)	42(34)	
2	89(36.2)	31(25)	58(47)	
3	48(19.5)	33(27)	15(12)	
4	48(19.5)	40(33)	8(7)	
<b>Drug availability at site</b>				0.086
Sometimes	51(20.7)	23(19)	28(23)	
Always	191(77.6)	100(81)	91(74)	
Never	4(1.6)	0(0)	4(3)	
<b>Have u been hospitalized</b>				<0.001
Yes	48(19.5)	35(28)	13(11)	
No	198(80.5)	88(72)	110(89)	

This study found out that Baseline cd4 ( $p<0.001$ ), clinic waiting time ( $p<0.004$ ), distance ( $p<0.001$ ), Duration on ART ( $p<0.001$ ) WHO clinical stage ( $p<0.001$ ) and history of hospitalization ( $p<0.001$ ) were statistically significantly associated with failure on firstline ARV drug as shown in the table 3 above.

#### 4.5 Personal factors associated with first line treatment failure

Treatment failure can be attributed to many factors including personal factors e.g., sexual partner being on ART, availability of community support groups, poor adherence, lack of disclosure, etc

*Table 4: Personal factors associated with failure on first line ARV drugs*

<b>personal factors</b>	<b>Overall 100%</b>	<b>Cases n=123(50%)</b>	<b>Controls n=123(50%)</b>	<b>P value</b>
<b>sexual partner on ART</b>				<0.001
Yes	149(60.6)	101(82)	48(39)	
No	97(39.4)	22(18)	75(61)	
<b>community support groups</b>				0.883
Yes	61(24.8)	31(25)	30(24)	
No	185(72.2)	92(75)	93(76)	
<b>missed taking your ARVS</b>				<0.001
Yes	108(43.9)	98(80)	10(8)	
No	138(56.1)	25(20)	113(92)	
<b>adequate nutrition at home</b>				<0.001
Sometimes	78(31.7)	58(47)	20(16)	
Always	145(58.9)	46(37)	99(80)	
Never	23(9.4)	19(15)	4(3)	
<b>disclosed your status to any</b>				<0.001
Yes	223(90.7)	103(84)	120(98)	<0.001
No	23(9.3)	20(16)	3(2)	
<b>substituted ARVS for herbals</b>				0.001
YES	41(16.7)	31(25)	10(8)	0.001
NO	205(83.3)	92(75)	113(92)	

Too many pills		14(5.7)	9(7)	5(4)	<0.001
Tired of drugs		19(7.7)	19(15)	00(0)	
Forgot		39(15.8)	22(18)	17(14)	
Others		30(12.2)	30(24)	00(00)	
Fear to be seen taking		62(25.2)	43(35)	19(15)	
None		82(33.3)	0(0)	82(67)	
<b>Taking alcohol</b>		102(41.5)	94(76)	8(7)	<0.001
Yes		144(58.5)	29(24)	115(93)	
No					
<b>Seek for medical services</b>	Yes	190(77.2)	79(64)	111(90)	0.001
No		56(22.8)	44(36)	12(10)	
<b>indulged in sexual affairs</b>	yes	107(43.5)	90(73)	17(14)	<0.001
	No	139(56.6)	33(27)	106(86)	
<b>Do u smoke</b>	yes	42(17.1)	37(30)	5(4)	<0.001
	No	204(82.9)	86(70)	118(96)	

All personal factors except community( $p=0.883$ ) were significantly found to be associated with failure on first line ARV drugs as presented in table 4.4 above.



## CHAPTER FIVE: DISCUSSION

### 5.0 Introduction

In this chapter, the findings of this study are discussed in comparison with literature of the previous scholar and limitations stated.

The outcome variable was first-line antiretroviral treatment failure.

Adult HIV positive who failed treatment after at least one year on ART were compared with those who were already on second line after failing on first line. All other variables were considered as independent variables

### 5.1 Social demographic characteristics associated with treatment failure on first line

The age of the clients who were significantly associated with treatment failure was 88(35.8%) this was the highest age of 36-45years this is also noted in other studies like the study conducted by Bachmann (2006) it was identified that the age of the client also affects adherence as young patients may not appreciate the importance of taking daily tablets(ARVs) resulting into treatment failure. This is so common because this is the time when one is very active so in the long run clients forget to swallow their medications.in another case some clients have fear of disclosing their sero status to their spouses or close relatives who would help them by reminding them to swallow their medication. This results into poor adherence which intern results into treatment failure.

Level of education was not significant in this study ( $p=0.098$  ) while in a study by Kwobah (2012) it was discovered that the level of education was significant different could have been due to the location of the study being carried out in a rural area it could have resulted into observed difference .Ina study by Nakimuli(2009) it was also identified that clients with little or no education were more likely to default their medication as they may not be adequately aware of the dangers of poor adherence. This is not the case in this study finding.

Urban areas are usually densely populated with different activities being carried out. it has been identified that the clients who stay in the urban areas (47.2%) they fail on first line because of

different habits which they practice i.e. substance abuse, having multiple sexual partners etc. this is also noted in the study conducted by sabate (2005) this revealed that clients residing in the urban areas are likely to fail on first line Anti retrovirals due to poor adherence. Caused by clients life style like smoking, buying commercial sex workers etc. Urban areas have so many clubs which predisposes the youth who go there to smoking, substance abuse and getting multiple sexual partners this intern results into some forgetting to swallow their medications resulting into treatment failure associated with poor adherence.

There was a significant difference in terms of employment status between patients who failed first line treatment and those who did not. Those who failed first line treatment were employed (36.6%) related to those who were not. This could mean that those who are employed could behaving challenges accessing ART in case of drug stock outs. OI/ART programs should prioritize these vulnerable people when drug stocking levels are below required minimum stocking levels. Most of these people are employed and are not given permission to go and pick their medications and others travel long distances this intern results into missing drugs hence resulting into poor adherence hence treatment failure.

## **5.2 Personal related factors associated with first line treatment failure**

As HIV affects the immune system and destroys the CD4 cells while the patient is still in AIDS stage then the client will have no illness, no signs and symptom of HIV so this client will feel healthy and have no reason for taking ARVs daily so they will end up missing as noted by Sabate(2005) in this study about adherence where he noted that the major factor associated with first line treatment failure was non adherence to ARVs due to patients not feeling sick. This is due to being in good health in the AIDS stage and those on septrin usually have no OI making the clients be healthy and end up not taking their ART regularly.

When clients health improves they tend to abandon their medication this is through clinical factors like no illness increase in weight etc as it has been discovered in this study. It was also highlighted in the Burnett et al (2005) where it was noted that patients abandon their medication due to forgetting. There is need for disclosure to avoid this challenge because one will be reminded of when to take his or her medications.

There were issues identified relating to personal factors associated to treatment failure clients reported lack of adequate pre ART counseling this is due to the clinicians being busy and language barrier(12.2%) this significantly affects adherence because of lack of enough information on the drugs which are to be taken for life. Having at least one individual counseling session on ART at ART commencement was a significant protective factor for first line HIV treatment failure in this study. While this indicates that institutions are providing this service, it means counseling is effective in reducing HIV treatment failure in Mubende Hospital. Consistent findings were made by Chimbetete (2009). This could indicate that if people are provided with counseling, adherence to ART could improve thereby reducing HIV treatment failure.

### **5.3 Clinical factors associated with first line ARVs**

When initiating ART its important to do a baseline CD4 as recommended by MOH the study findings show that initiating art with a CD4 less than 100 significantly related to first line treatment failure as it was also discovered by kwobah ( 2014) in his case – CONTROL study. This can be brought about by lack of knowledge on the importance of testing for HIV because when on tests then this will help in early identification and initiation to ART.

Mubende regional referral hospital serves many areas and many clients prefer getting their ARVs from Mubende RRH because of the drug availability at Mubende . Clients walk long distances to get services from Mubende RRH. This was also identified in the study by Byakika (2007),This showed that clients who move long distances at times miss picking their drugs due to lack of transport money resulting into first line treatment failure. This has been as a result of the clients in Mubende RRH majority being peasant farmers. This has resulted into lacking transport money to clinic as they travel long distances some more than 10 km. These clients have missed both their clinic appointments and picking and swallowing their antiretroviral drugs.

Failure of a client to take drugs (ARVs) in the right dose right and at the right time is termed as poor adherence this was identified in this study as one of the significant factor for treatment failure of first line ART. Its noted that clients with poor adherence(80%)are at a high risk of failing on first line ART. This was also one of the significant factors in the study conducted by Byakika(2007). This was identified in this study by calculating the number of missed doses over the last 3 days and the clients were interviewed and dichotomized at +/-95% adherence.

ART drug stock outs are a common problem in the country due to policies and the National Medical Stores programmes. In Mubende it's not the case as the drugs (ARVs) are available

Throughout the year this is attributed to proper planning and forecasting of the hospital pharmacist. The study has showed that whenever clients come to clinic they find the drugs available (77.6%) this is not the same as in the other studies like the one conducted by Hogan(2005) where it was identified that one of the clinical factors for the first line treatment failure was frequent stock out of all the necessary medications including ARVS. This led directly to missed doses which highly contributed to treatment failure. Having a committee responsible for drug procurement making reports and orders of drugs early enough can help to reduce on the problem of stock outs which directly affects the client's adherence resulting into first line treatment failure.

Starting ART when the client has developed the signs and symptoms of HIV is very worrying. When the immune system has been severely destroyed its regeneration is quite hard as in this study those who started ART while in stage 4 were(19.5%) patients that started ART with less than 100 cells failed more than those that started ART with at least 100 cells)this was also noted by kwabah (2014) that starting ART with a very low baseline CD4 and in WHO stage 4 was one of the major reasons for first line treatment failure. These clients failed more compared to those that started ART with A CD4 above 100 cells and in WHO stage one or two had been on first line ART for a long time.

#### **5.4 Implications**

Most of the findings being clinical this has both public health problems and clinical to both the clients the families country and the productivity industry. These implications will lead to increased number of clients failing on first line this will intern led to increased number of new cases being infected with a wild type of the virus leading to many more treatment failures on first

line hence resulting into switch to second line of many clients which drugs are too costly for the government to purchase. This is a very big public health concern.

### **5.5 Study limitations**

In this study however, the researcher anticipated some limitations which included:

A non-probability method was used in participant recruitment this biased the study because most of the variables are significant.

The cases were those clients who failed on first line ART this resulted into recall bias because these clients were more likely to remember the causes of failure than the controls who were clients on first line who do not know the causes of treatment failure.

The study was limited to Mubende district in Mubende regional referral hospital HIV positive clients on ART. This could not give the National picture of first line treatment failure as Mubende is a small district found in central.

There are areas that were beyond the scope of this study and were therefore not answered. We suggest a process-outcome evaluation on the AIDS program in Mubende district to explain poor performance outcomes of the program

Low base line cd4 there is need to put strategies of massive testing so that the strategy on test and treat is implemented to catch clients early and initiate them on ART

Despite all the alleged limitations and challenges, the results of the study provided a meaningful basis for filling the gaps on the factors associated with first line treatment failure of HIV positive clients attending Mubende Hospital ART clinic

## **CHAPTER SIX: CONCLUSION AND RECOMMENDATION**

### **6.0 introduction**

This study found out that failure on first line ARV drug was associated with age, gender, marital status, occupation, monthly incomes and area of residence of HIV clients among socio demographic factors.

The clinical factors found to be associated with failure on first line on first line ART were baseline cd4, clinic waiting time, distance from home, duration on ART, WHO clinical stage and history of hospitalization

This study also found that partners on ART, non-adherence to ART, poor nutrition, history of disclosure, history of substituting ARVs with herbs, alcohol consumption and history of health seeking behavior were associated with failure on first line ART.

### **6.1 Recommendation**

The Government should put more funding in drug procurement so that there is the strategy of test and treat is initiated this will help to reduce on the HIV transmission rates, reduce on morbidity and mortality rates due to HIV, early initiation will help to improve client s health and hence prolonged stay on first line etc

### **6.2 Summary of the finding**

Summatively, the development of HIV treatment failure is not only a global clinical and public health concern but also a threat to ART expansion efforts in countries that use ART particularly in Uganda. This means that effort should be directed towards reducing it for better treatment outcomes. Preventing HIV first line treatment failure (virological failure) is important for minimizing if not preventing disease progression and avoiding the development of antiretroviral resistance i.e. wild strains of Human Immuno deficiency Virus Drug Resistance (HIVDR)[4].

### **6.3 Conclusion**

First line HIV treatment failure affected all age groups in Mubende district Hospital ART clinic. Multiple etiological factors were associated with first line HIV treatment failure in Mubende district. Poor adherence, use of multiple sexual partners, and baseline WHO Stage 3 or 4 were demonstrated to be independent risk factors for HIV first line treatment failure in the district. Disclosing HIV status were significantly protective in Mubende district hospital. Results of the study provided guidance to AIDS program managers to reduce first line HIV treatment failure in Mubende district.

### **6.4 Recommendation**

- 1) The Ministry of Health should strengthen the importance of information dissemination of adherence to medications especially Antiretroviral drugs to the masses in different languages and in different forms eg brochures radio talks ,Role plays etc this will help to educated the masses and adherence will be strengthened hence avoiding first line treatment failure
- 2) There are areas that were beyond the scope of this study and were therefore not answered. We suggest a process-outcome evaluation on the AIDS program in Mubende district to explain poor performance outcomes of the program of ART especially at initiation stage So that treatment failures are avoided.
- 3) The Ministry of Health, National Medical Stores procurement team should ensure timely drug ordering and supplying drugs(ARV) to the lower health facilities. This will avoid drug stock outs in the health Centre's and poor adherence will be avoided hence first line treatment failure will be avoided
- 4) Health Centre's should ensure accurate including forecasts and timely reporting to the MOH to ensure early drug ordering and supplying to the different health Centre's. These Centre's should also order for emergency drugs early enough to avoid stock outs.
- 5) The government should include the counseling course unit in the training schools for both the doctors and nurses so that the clients receive the full package of comprehensive care from one clinician. This will strengthen the nurse client relationship and it will also help in client disclosure to their spouses and reduce on self-stigma



## REFERENCES

*Andhra Pradesh state of India to inform resource allocation.*"Aids23 (2): 233-42.  
antiretroviral therapy in HIV-infected Ugandans: prevalence and associated factors." *JAcquir Immune DeficSyndr* 45(2): 218-23.

Bachmann, M.O. (2006). "*Effectiveness and cost effectiveness of early and late prevention of*  
Badri, M., Maartens, G. (2006) "*Cost-effectiveness of highly active antiretroviral therapy in*  
Baltimore, Johns Hopkins University. [http](http://).

Bartlett, J.G., Gallant, J.E. (2005). *Medical Management of HIV infection*. Baltimore, The JohnsHopkins University.

Burnett, R et al (2005). *Hepatitis B virus and human immunodeficiency virus co-infection in sub-Saharan Africa: a call for further investigation*. *Liver International* 25 (2), 201–213.

Byakika-Tusiime, J. Kiguba, R., (2007). "Discontinuation and modification of highly active  
Charles M, et al.(2013) *Virologic, clinical and immunologic responses following failure of first-line antiretroviral therapy in Haiti*. Charles M, et al. *J Int AIDS Soc*. 2012;15:17375.  
<http://www.jiasociety.org/content/15/2/17375>. Accessed 27/08/2015

Cleary, S., McIntyre, M.D. (2006) "*The cost-effectiveness of antiretroviral treatment in clinic*. *AIDS Res Ther*. 2013;10(1):25.

Dandona, L., Kumar, S.G. (2009). "*Economic analysis of HIV prevention interventions in*  
DeMaria, L.M., Bautista-Arredondo, S. (2008). *Cost-effectiveness and cost evidence for*  
Galarraga, O., Colchero, P., (2009). *HIV Prevention cost-effectiveness: a review of the literature 2005-2008*. Cuernavaca, Mexico, Instituto Nacional de Salud Publica.

Goldie, S.J., Yazdanpanah, Y. (2006). *Cost-effectiveness of HIV treatment in resource-poor*  
Gray, R.H., Li, X. (2007). "The impact of male circumcision on HIV incidence and cost per  
Hausler, H.P., Sinanovic, E. (2006). "*Costs of measures to control tuberculosis/HIV in public  
HIV/AIDS care and treatment in resource constrained settings: A review of the literature.*  
Cuernavaca, Mexico, Institute National de Salud Publica.

*HIV/AIDS progression with antiretrovirals or antibiotics in Southern African adults."* AIDS  
Care 18(2): 18-29.

Hogan, D.R., Salomon, J.A. (2005). "*Prevention and treatment of human immunodeficiency*  
<http://www.unaids.org/en/media/unaids/contentassets/documents/epidemiology/2012>  
importance of depression, abuse, and other traumatic events. *AIDS Patient Care STDs.*2006;  
20:418–428.

infection prevented: a stochastic simulation model from Rakai, Uganda." *Aids* 21(7): 845-50.

Katabira, E et al.(2005) *Adherence to HIV anti-retroviral therapy in HIV+ Ugandan patients  
purchasing therapy.*Int J STD AIDS 16:38-41.

*Khayelitsha, South Africa--a primary data analysis."*CostEffResourAlloc 4: 20.

Long, E.F., Brandeau, M.L. (2006). "*Effectiveness and cost-effectiveness of strategies to  
expand antiretroviral therapy in St. Petersburg, Russia."* Aids 20(17): 2207-15.

Marseille, E., Hofmann, P.B. (2002). "*HIV prevention before HAART in sub-Saharan  
Africa."*Lancet 359(9320): 1851-1856.

McDonald, H.et al (2002). *Interventions to enhance patient adherence to medication  
prescriptions: scientific review.* JAMA 2002; 288:2868-2879.

Mugavero, M., et al. (2006). Barriers to antiretroviral adherence: The Nakimuli-Mpungu, at al (2009). *Psychological distress and adherence to highly active anti-retroviral therapy (HAART) in Uganda: A pilot study. African Health Sciences Vol 9 Special Issue1 1 August 2009.*

O'Brien, D. et al (2006). 'In resource limited settings good early outcomes can be achieved in children using adult fixed-dose combination antiretroviral therapy. *AIDS*, 20: 1955-1960. Organization. Geneva., 212 pp.

Osterberg, M., Blaschke, T. (2005). Adherence to Medication, *N Engl J Med*, 2005(353):487-97

Peveler, R., et al (2007). Effect of Antidepressant drug counseling and information leaflets on adherence to drug treatment in primary care. Randomized controlled trial. *British Medical Journal* 319, 612-615.

Pham, A. et al. (2005). Antiretroviral Drug Interactions: A Practical Approach, *primary care facilities in Cape Town, South Africa.* *Bull World Health Organ* 84(7): 528-36.

Sabaté, E. (2005). "Adherence to Long term Therapies: Evidence for Action". World Health Sarna, A., et al (2005). "Promoting adherence to antiretroviral therapy through a directly administered antiretroviral therapy (DAART) strategy in Mombasa Kenya, Horizons Research Update. Nairobi: Population Council.

Sebunya R, et al. (2013) *Incidence and risk factors for first line anti retroviral treatment failure among Ugandan children attending an urban HIV settings--the case of Cote d'Ivoire. N Eng l J Med* 355(11): 1141-53. *South Africa.* PLoS Med 3(1): e4.

UNAIDS. Regional fact sheet Sub-Saharan Africa; 2012. Available at:

UNAIDS AIDS report on Global AIDS epidemic: 2013. [www.unaids.org/en/media/unaids/contentassets/documents/epidemiology/2013](http://www.unaids.org/en/media/unaids/contentassets/documents/epidemiology/2013)

*virus/acquired immunodeficiency syndrome in resource-limited settings." Bull World Health Organ 83(2): 135-43.*

Watera, C., et al (2006). *Feasibility and effectiveness of cotrimoxazole prophylaxis for HIV-1-infected adults attending an HIV/ AIDS clinic in Uganda. J Acquir Immune Defic Syndr 42: 373-8.*

**APPENDIX I: CONSENT FORM**

**Title of Study:** *FACTORS ASSOCIATED WITH FIRST LINE TREATMENT FAILURE OF HIV POSITIVE CLIENTS ATTENDING MUBENDE HOSPITAL ART CLINIC.*

Description of the research and your participation:

You are invited to participate in a research study conducted by NAMBUYA JULIET as principal Investigator. The purpose of this research is to identify the factors associated with first line treatment failure of HIV positive clients attending Mubende Hospital ART clinic.

Potential Benefits: There are no known benefits to you that would result from your participation in this research, but the study will understand the factors associated with first line treatment failure of HIV positive clients attending ART clinic.

Confidentiality: During the study the information provided will be kept confidential. Anonymity will be ensured in the write-up by disguising your identity and on completion of the dissertation; data will be retained for six months and then destroyed.

Contact Information: In case you may have any questions or concerns about this study, please contact NAMBUYA JULIET of International Health Sciences University at .....

Consent

I have read, or been read to this consent form and have been given the opportunity to ask questions. I give my consent to participate in this study.

Participant's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## APPENDIX II: QUESTIONNAIRE

*Dear Respondent,*

I am Nambuya Juliet, a student of International Health Sciences University. I am conducting an academic research study under the topic “factors associated with first line treatment failure of HIV positive clients attending Mubende Hospital ART clinic”. You are humbly requested to participate in this study by filling in the questionnaire. All the answers that you was provide shall be treated with utmost confidentiality and was be used purely for academic purposes. *Please tick or write your answer in the space or box provided.*

### STATUS

1 CASE

2 CONTROLS

### Section A: Socio demographic factors

- 1) Age
  - a. 18 – 25 years
  - b. 26 – 35 years
  - c. 36 – 45 years
  - d. 46 years and above
- 2) Gender
  - a. Male
  - b. Female
- 3) Marital status
  - a. Single
  - b. Married
  - c. Divorced/Separated
  - d. Widow/widower
- 4) Level of education
  - a. No formal education
  - b. Primary level
  - c. Secondary level
  - d. Tertiary level

- 5) Occupation
  - a. Housewife
  - b. Self employed
  - c. Civil servant/professional
  - d. Unemployed
  - e. Others (specify).....
- 6) Monthly income level of household
  - a.  $\leq 100,000$ shs
  - b.  $\geq 100,000$ shs
- 7) Area of residence
  - a. Urban
  - b. Semi urban
  - c. Rural

**Section B: Clinical factors**

- 8) What was your CD4 at the beginning of ARVs?.....
- 9) Do you always receive CD4 screening services at MRRH when you need them?
  - a. Yes
  - b. No
- 10) Which ART regimen are you currently taking?
  - a. NVP based regimen
  - b. EFV based regimen
  - c. Others (specify).....
- 11) For how long have you been on(taking) ART regimen( in years).....
- 12) What was the WHO clinical staging at the time of diagnosis of HIV
 

Stage 1 .....	Stage 2.....
Stage 3 .....	Stage 4.....
- 13) How far is Mubende Regional Referral located from our home?
  - a. Less than 5 km
  - b. 5 – 9 km
  - c. 10 or more





**Section C: Personal factors**

24) Have you ever missed taking your medication (ARVS)?

- a. Yes
- b. No

25) If yes, how many times have you missed?.....

26) What were the reasons for missing your pills.....

27) Do you ensure that you get adequate nutrition and balanced diets in your home every day?

- a. Sometimes
- b. Always
- c. Never

Is your sexual partner on ART?

- Yes
- NO

28) Have you ever substituted ARVs in favor of local herbs?

- a. Yes
- b. No

29) What other personal factors are associated with first line treatment failure of HIV positive clients attending Mubende Hospital ART clinic?.....

.....

Do you take alcohol or any other substance

- a. Yes
- b. No

30) Do you seek for medical services whenever you get any illness

- a. Yes
- b. No

31) Have you indulged in other sexual relationships from the official one

- Yes
- No

32) Do you smoke?

- Yes
- No

*Thanks for your co-operation.*

### APPENDIX III: MAP OF UGANDA SHOWING MUBENDE DISTRICT



Mubende district

Key

Map of Uganda showing the location of Mubende district. This is where the researcher conducted the research from

## APPENDIX IV: INTRODUCTORY LETTER



*making a difference in health care*

**Office of the Dean, School of Nursing**

Kampala, 27<sup>th</sup> October 2015

THE HOSPITAL DIRECTOR  
MUBENDE REGIONAL  
REFERRAL HOSPITAL

Dear Sir/Madam,

**RE: ASSISTANCE FOR RESEARCH**

Greetings from International Health Sciences University.

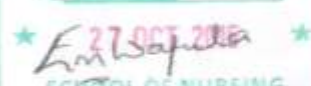
This is to introduce to you **Nambuya Juliet** Reg No. **2012-BNS-TU-011** who is a student of our University. As part of the requirements for the award of a Bachelors degree in Nursing of our University, the student is required to carry out research in partial fulfillment of her award.

Her topic of research is: **Factors associated with first line treatment failure of HIV positive clients attending Mubende Hospital ART Clinic**

This therefore is to kindly request you to render the student assistance as may be necessary for her research.

I, and indeed the entire University are grateful in advance for all assistance that will be accorded to our student.

Sincerely Yours,

  
SCHOOL OF NURSING  
Mrs. Wafua Elizabeth  
Dean

The International Health Sciences University  
P.O. Box 7782 Kampala - Uganda  
(+256) 0312 307400 email: [wwafua@ihsu.ac.ug](mailto:wwafua@ihsu.ac.ug)  
web: [www.ihsu.ac.ug](http://www.ihsu.ac.ug)

**APPENDIX V: CORRESPONDENCE**

TELEPHONE: 256 - 414 - 554008/1  
FAC: 256 - 0414 - 532591  
mail : admin@mubende.or.ug  
website: www.Mubende.or.ug



**Mubende R.R Hospital**  
**P. O. Box 4**  
**Mubende**

TO Nambuya Juliet  
Nursing officer  
Mubende R. R .H



**RE-ACCEPTANCE OF YOUR REQUESTION TO CARRY OUT YOUR RESEARCH STUDY IN MUBENDE R R HOSPITAL ARTCLINIC**

You're hereby informed that you have been allowed to carry out your research study in the Hospital ART clinic as you had requested.

Your's in service

A handwritten signature in black ink, appearing to read 'Dr. Musinguzi Patrick'.

Dr. Musinguzi Patrick

CHRONIC CARE CLINIC MANAGER

