

**BINDURA UNIVERSITY OF SCIENCE EDUCATION**



**FACULTY OF SCIENCE AND ENGINEERING**

**DEPARTMENT OF MATHEMATICS AND STATISTICS**

**EXPLORING THE RELATIONSHIP BETWEEN ANTIRETROVIRAL THERAPY  
(ART) DEFAULT AND HIV DEATHS IN ZIMBABWE: A CASE OF PARIRENYATWA  
GROUP OF HOSPITALS**

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE  
REQUIREMENTS OF THE BACHELOR OF SCIENCE HONOURS DEGREE IN  
STATISTICS AND FINANCIAL MATHEMATICS**

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**JUNE 2023**

**DECLARATION**

This is to certify, that this research project is the result of my own research work and has not been copied or extracted from past sources without acknowledgement. I hereby declare that no part of it has been presented for another degree in this University or elsewhere.

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## **DEDICATION**

I dedicate this research project to my lovely parents, young brothers and big sister.

## ACKNOWLEDGEMENT

I would like to express my sincere gratitude to Parirenyatwa Group of Hospitals stakeholders for their invaluable support and assistance in completing this research. Their contribution helped me immensely in understanding the relationship between ART default and HIV mortality rates in Zimbabwe. Special thanks go to my supervisor Ms J.C Pagan'a for the knowledge, assistance, support and care throughout the course of my research. I would also like to thank my friends Andy Gwenhure, Alex Nyakwima, Godknows Murenza, Patrick Rajabhu and Real Karonga for their support and encouragement throughout the research process. I thank the Almighty God who has given me strength, care, knowledge and the opportunity to pursue education to this far. Finally, I am grateful to my family for their unwavering support and encouragement during this journey. Their love and understanding helped me stay focused and motivated to complete this research. Thank you all for your contributions and support.

## **ABSTRACT**

The study aimed at exploring the relationship between not adhering to antiretroviral therapy (ART) treatment (known as ART default) and HIV-related deaths in Zimbabwe. The goal was to identify ways to improve ART adherence and decrease death rates among Zimbabweans living with HIV. The main objectives of this study were to determine how common ART default is among Zimbabweans with HIV, to examine the relationship between ART default and HIV-related deaths in Zimbabwe; and to establish possible ways to improve ART adherence. Understanding how ART default and HIV death rates are related in Zimbabwe is important for developing effective ways to improve treatment adherence and decrease deaths among people with HIV. The researcher used qualitative and quantitative statistics to explore the relationship between ART default and HIV-related deaths in Zimbabwe. The researcher surveyed 15 participants and interviewed 3 key informants. Most (66.7%) of the participants were female. The major aim of the research was to measure how defaulting from ART related to HIV-related deaths in Zimbabwe, which had not been studied before. The study found that over 20% of Zimbabweans with HIV who were on ART defaulted from treatment. The researcher also looked at reasons for ART default and findings revealed that limited access to health centres was the major cause of default (33.3% of respondents), followed by religious/cultural beliefs (26.6%), discrimination/stigma (20%), running out of medication (13.3%), and other factors (6.7%). In summary, the key findings revealed that ART default in Zimbabwe is common and relates to higher rates of HIV-related death. Improving access to healthcare, addressing religious/cultural barriers, and reducing stigma may help decrease ART default and improve health outcomes for people with HIV in Zimbabwe.

## **TABLE OF CONTENTS**

<b>DECLARATION</b> .....	i
<b>DEDICATION</b> .....	ii
<b>ACKNOWLEDGEMENTS</b> .....	iii

<b>ABSTRACT</b> .....	<b>Error! Bookmark not defined.</b>
<b>LIST OF TABLES</b> .....	viii
<b>LIST OF ACROMNYS AND ABBREVIATIONS</b> .....	ix
<b>CHAPTER ONE: INTRODUCTION</b> .....	1
<b>1.0. INTRODUCTION</b> .....	1
<b>1.1. BACKGROUND OF THE STUDY</b> .....	1
<b>1.2. PROBLEM STATEMENT</b> .....	2
<b>1.3. OBJECTIVES</b> .....	3
<b>1.4 RESEARCH QUESTIONS</b> .....	3
<b>1.5. JUSTIFICATIONS OF THE STUDY</b> .....	3
<b>1.6. SIGNIFICANCE OF THE STUDY</b> .....	4
<b>1.7. ASSUMPTIONS</b> .....	4
<b>1.8. DELIMITATIONS OF THE STUDY</b> .....	5
<b>1.9. LIMITATIONS</b> .....	5
<b>1.10. SUMMARY</b> .....	5
<b>CHAPTER 2: LITERATURE REVIEW</b> .....	7
<b>2.1 INTRODUCTION</b> .....	7
<b>2.2 THEORETICAL FRAMEWORK</b> .....	7
<b>2.2.1. Prevalence of Art default among HIV positive individuals</b> .....	7
<b>2.2.2. Relation between Art and Mortality in Zimbabwe</b> .....	9
<b>2.2.3. Effects of Art default duration on mortality rate</b> .....	9
<b>2.2.4 RISK FACTORS FOR ART DEFAULTING</b> .....	11
<b>2.2.5. Factors that increases the risk of HIV mortality</b> .....	9
<b>2.2.6. Identification and support of Art defaulters</b> .....	12
<b>2.2.7. Strategies to improve treatment adherence</b> .....	13
<b>2.2.8. Conceptual framework</b> .....	15

<b>2.3. EMPEICAL LITERATURE.....</b>	<b>16</b>
<b>2.4. KNOWLEDGE GAP.....</b>	<b>16</b>
<b>2.6. CHAPTER SUMMARY.....</b>	<b>18</b>
<b>CHAPTER THREE: RESEARCH METHODOLOGY.....</b>	<b>18</b>
<b>3.0 INTRODUCTION.....</b>	<b>18</b>
<b>3.1 RESEARCH APPROACH.....</b>	<b>18</b>
<b>3.2 RESEARCH DESIGN.....</b>	<b>19</b>
<b>3.4 TARGET POPULATION.....</b>	<b>20</b>
<b>3.5 SAMPLING.....</b>	<b>20</b>
<b>3.6 DATA COLLECTION PROCEDURES AND RESEARCH INSTRUMENTS.....</b>	<b>21</b>
<b>3.6.1 Survey.....</b>	<b>21</b>
<b>Questionnaire technique.....</b>	<b>21</b>
<b>3.6.2 Interviews.....</b>	<b>22</b>
<b>Key informant interviews guides.....</b>	<b>22</b>
<b>3.7 DATA PRESENTATION AND ANALYSIS PROCEDURES.....</b>	<b>23</b>
<b>3.8 ETHICAL CONSIDERATIONS.....</b>	<b>23</b>
<b>3.9 CHALLENGES FACED.....</b>	<b>25</b>
<b>3.10 SUMMARY.....</b>	<b>25</b>
<b>CHAPTER FOUR.....</b>	<b>26</b>
<b>DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS.....</b>	<b>26</b>
<b>4.0 CHAPTER INTRODUCTION.....</b>	<b>26</b>
<b>4.1 DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS.....</b>	<b>26</b>
<b>4.2 RELATIONSHIP BETWEEN ART DEFAULT AND HIV MORTALITY IN ZIMBABWE....</b>	<b>29</b>
<b>4.3 PREVALENCE OF ART DEFAULT AMONG HIV-POSITIVE INDIVIDUALS IN ZIMBABWE.....</b>	<b>29</b>
<b>4.4 IMPACT OF ART DEFAULT.....</b>	<b>36</b>

<b>4.5 STRATEGIES TO REDUCE ART DEFAULT .....</b>	<b>38</b>
<b>4.5.2 Health authorities to disseminate evidence based information which does not contradict each other.....</b>	<b>39</b>
<b>4.5.4 Public Health Campaigns for ART .....</b>	<b>39</b>
<b>4.6 DISCUSSION OF FINDINGS .....</b>	<b>41</b>
<b>4.7 CHAPTER SUMMARY.....</b>	<b>42</b>
<b>CHAPTER FIVE .....</b>	<b>43</b>
<b>SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.....</b>	<b>43</b>
<b>5.0 INTRODUCTION.....</b>	<b>43</b>
<b>5.1 SUMMARY OF FINDINGS .....</b>	<b>43</b>
<b>5.2 CONCLUSIONS .....</b>	<b>46</b>
<b>5.3 IMPLICATIONS TO STATISTICS AND FINANCIAL MATHEMATICS PRACTICE .....</b>	<b>47</b>
<b>5.4 RECOMMENDATIONS.....</b>	<b>47</b>
<b>5.4.1 RECOMMENDATIONS TO THE GOVERNMENT .....</b>	<b>47</b>
<b>5.4.2 RECOMMENDATIONS TO HIV POSITIVE INDIVIDUALS.....</b>	<b>48</b>
<b>5.4.3 RECOMMENDATIONS TO HEALTH CARE WORKERS.....</b>	<b>48</b>
<b>5.4.4 RECOMMENDATIONS TO RELIGIOUS LEADERS.....</b>	<b>48</b>
<b>5.4.5 RECOMMENDATIONS TO CIVIL SOCIETY ORGANISATIONS.....</b>	<b>48</b>
<b>5.5 AREA FOR FUTURE RESEARCH .....</b>	<b>49</b>
<b>5.6 CHAPTER SUMMARY.....</b>	<b>49</b>
<b>REFERENCE LIST.....</b>	<b>50</b>
<b>APPENDICES .....</b>	<b>54</b>
<b>ANNEX 1: INFORMED CONSENT FORM .....</b>	<b>54</b>
<b>ANNEX 2: QUESTIONNAIRE .....</b>	<b>55</b>
<b>ANNEX 3: KEY INFORMANT INTERVIEW GUIDE.....</b>	<b>58</b>



## **LIST OF TABLES**

Table 1: showing list of key informants

Table 2: showing demographic distribution of the study

Table 3: showing the prevalence of ART default

Table 4: showing the causes of ART default

Table 5: showing the effects of ART defaulting

## **LIST OF ACROMNYS AND ABBREVIATIONS**

AIDS	Acquired Immune Deficiency Syndrome
ART	Antiretroviral Therapy
HIV	Human Immune Virus
NAC	National Aids Council
PGH	Parirenyatwa Group of Hospitals
SAT	Southern sexual reproductive health Africa Trust Zimbabwe

UNAIDS

The Joint United Nations Programme on HIV/AIDS

WHO

World Health Organisation

ZAN

Zimbabwe Aids Network

# CHAPTER ONE

## INTRODUCTION

### 1.0. INTRODUCTION

In this chapter the researcher gave a detailed explanation on the background of the study, problem statement, objectives, research questions, justification of the study and significance of the study, assumptions, delimitations, limitations and summary. In exploring the relationship between antiretroviral therapy (ART) and Human immunodeficiency virus (HIV) deaths in Zimbabwe.

### 1.1. BACKGROUND OF THE STUDY

HIV and AIDS is one of the leading cause of deaths throughout the world with an estimated 650000 people dying annually, (UNAIDS, 2016). HIV destroys human immune system making it hard for infected people to fight opportunistic infections thereby making them susceptible to mortality. This propagated the need for a combative effort to fight the HIV pandemic in the form of various policies and programs such UNAIDS fast track targets of 90-90-90 which most countries have achieved and scaling up to 95-95-95 which means that by 2025, 95% people should be aware of their HIV status of which 95% should be on treatment and 95% viral load suppression. With such ambitious goals, ART is the key primary treatment method for HIV as it helps in HIV viral load suppression. Despite the health benefits of ART many people have been defaulting on treatment thus this research provides a comprehensive overview of the relationship between Art default and HIV mortality in Zimbabwe. Art is important in the management of HIV/AIDS and its impact on reducing morbidity and mortality rates among people living with the virus. However, despite the benefits of Art, some individuals default on their treatment, which can lead to poor health outcomes, including increased risk of HIV-related mortality (Mills et al.,2006)

The chapter then goes on to explain the significance of the study, which is to explore the relationship between Art default and HIV deaths in Zimbabwe using a logistic regression model. This is important because Zimbabwe has a high HIV prevalence rate, and Art default is a

significant public health concern. Understanding the relationship between Art default and HIV mortality is crucial for developing effective interventions to improve treatment adherence and reduce mortality rates.

Cultural expression has also been identified as a crucial determinant of health and well-being. The United Nations Educational, Scientific and Cultural Organization (2020) highlights the role of culture in promoting social cohesion, identity, and mental health. Art, in particular, has been found to have therapeutic effects on individuals experiencing mental health issues. However, in Zimbabwe, the decline in art has resulted in a loss of cultural identity and a decrease in social cohesion. The political context in the country has also contributed to the decline in art, with government policies that restrict artistic expression and limit funding for the arts (United Nations, 2015).

Therefore, exploring the relationship between art default and deaths in Zimbabwe is essential in understanding the impact of cultural expression on health outcomes. The logistic regression model can provide insights into the relationship between mortality rates and cultural expression, social determinants of health, and political context. In conclusion, art is not just a form of entertainment but also an essential aspect of human well-being. The decline in art in Zimbabwe has resulted in a loss of cultural identity and social cohesion, which has contributed to increased mortality rates. By understanding the relationship between art default and deaths in Zimbabwe, policymakers can develop strategies to promote cultural expression and improve health outcomes in the country.

## **1.2. PROBLEM STATEMENT**

It has been observed that there is a high rate of ART default among HIV positive individuals in Zimbabwe, which has serious implications for HIV mortality rates. Despite the availability of ART, up to 40% of patients on treatment default within the first year, leading to treatment failure, disease progression, and death, (World Health Organisation, 2014). The study aims to explore the relationship between ART default and HIV mortality in Zimbabwe, with the goal of identifying strategies to improve treatment adherence and reduce mortality rates among people living with HIV/AIDS in the country. This research is important because it can inform policy and practice on how to better support individuals on ART and ultimately reduce the burden of HIV/AIDS in Zimbabwe.

### **1.3. OBJECTIVES**

1. To determine the prevalence of ART default among HIV-positive individuals in Zimbabwe.
2. To examine the relationship between ART default and HIV mortality in Zimbabwe.
3. To establish possible intervention strategies that can be put in place to improve ART adherence.

### **1.4 RESEARCH QUESTIONS**

1. What is the relationship between ART default and HIV mortality in Zimbabwe?
2. How does the duration of ART default impact HIV mortality rates in Zimbabwe?
3. Are there specific demographic or clinical factors that increase the risk of HIV mortality among those who default on ART in Zimbabwe?
4. What interventions can be implemented to reduce the risk of HIV mortality among those who default on ART in Zimbabwe?
5. How can healthcare providers better identify and support individuals who are at risk of defaulting on ART in order to prevent HIV mortality in Zimbabwe?

### **1.5. JUSTIFICATIONS OF THE STUDY**

This study on the relationship between not taking ART as prescribed (ART default) and HIV-related deaths in Zimbabwe is important for several reasons. First, Zimbabwe has one of the highest rates of HIV in the world, with an estimated 1.3 million people living with HIV in 2020. ART is the main treatment for HIV and has been proven to greatly decrease sickness and death in people with HIV. However, many people in Zimbabwe do not take their ART as directed, with up to 30% stopping treatment within a year of starting it..

To the research participants this research project shall act as a platform for the participants to air out freely without any form of coercion what they actually think ART which makes them to default from it. Considering the lack of freedom of speech in Zimbabwe this shall be a suitable platform to vent out what they feel freely, with no fear since they will be guaranteed of confidentiality by the researcher. Therefore, this will provide data to the local authorities, and even international community to understand the programs they want regarding ART adherence. This will also then

be used for future use since other chronic diseases and pandemics such as Covid 19, smallpox are emerging, so the local authorities will be well informed.

Understanding the relationship between ART default and HIV mortality rates in Zimbabwe is crucial for developing effective interventions to improve treatment adherence and reduce mortality among people living with HIV. The study conducted in Zimbabwe show that ART reduced mortality rates by 72% among patients initiating treatment between 2004 and 2007 (Mugavero et al.,2010). Additionally, identifying demographic and clinical factors that increase the risk of HIV mortality among those who default on ART can help healthcare providers target interventions to those who are most at risk.

## **1.6. SIGNIFICANCE OF THE STUDY**

The study is significant in several ways:

1. Shedding light on the complex interplay between access to ART and HIV-related mortality: The study provides insights into the factors that contribute to ART non-adherence and its impact on HIV outcomes. This can help policymakers and healthcare providers to develop targeted interventions to improve ART adherence and reduce HIV-related mortality.
2. Informing the development of targeted interventions: By identifying the factors that contribute to ART non-adherence, the study can inform the development of targeted interventions that address these specific issues. This can lead to more effective strategies for improving ART adherence and reducing HIV-related mortality.
3. Broader implications for other countries: The findings of the study can have broader implications for other countries grappling with similar challenges in HIV treatment and care. By understanding the factors that contribute to ART non-adherence and its impact on HIV outcomes, other countries can develop targeted interventions that are tailored to their specific contexts.

In summary, this study is important because it improves our understanding of the complicated relationship between taking ART as prescribed and HIV-related deaths. It provides information that can help in creating focused efforts to enhance HIV treatment and care.

## **1.7. ASSUMPTIONS**

1. The study explored the relationship between ART default and HIV deaths in Zimbabwe.

2. The study provided comprehensive information on this topic.
3. There may be limitations to the generalizability of the study's findings to other settings.
4. The study may have relied on retrospective data that could be subject to bias and incomplete documentation.
5. Social and structural factors, such as stigma and discrimination, may influence ART adherence and mortality rates among people living with HIV.
6. The study did not address the potential impact of ART default on HIV transmission.
7. Poor treatment adherence has broader public health implications.

### **1.8. DELIMITATIONS OF THE STUDY**

The study only focused on one country, Zimbabwe, which may limit the generalizability of the findings to other settings. The study also relied on retrospective data, which may be subject to recall bias and incomplete documentation since its data based on past data sources. Retrospective data refers to the data that is collected from past events or situations, it is often used in research to analyze and evaluate data that has already been collected, and it comes from a variety of sources, including medical records, surveys, and administrative databases. Furthermore, the study did not consider social and structural factors, such as stigma and discrimination that may influence ART adherence and mortality rates among people living with HIV. Finally, the study did not address the potential impact of ART default on HIV transmission and the broader public health implications of poor treatment adherence.

### **1.9. LIMITATIONS**

The researcher experienced some challenges during the study. These included resistance to disclose some information since it was too sensitive however the researcher adopted the Socratic method of questioning so as to latter arrive at the truth.

### **1.10. SUMMARY**

This chapter clearly show the crucial way in conducting a research study by laying the bold foundation of the study on exploring the relationship between art default and HIV deaths in the



country (Zimbabwe). The following chapter give details on the theoretical studies related to this research study.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 INTRODUCTION

Antiretroviral therapy (ART) is a crucial component of HIV treatment and prevention in sub-Saharan Africa. ART has been shown to significantly reduce morbidity and mortality rates among people living with HIV (PLHIV). However, adherence to ART is often challenging due to various factors, including stigma, poverty, and inadequate healthcare infrastructure. ART default, defined as missing medication for more than 30 days, is a common problem in Zimbabwe, and it has been associated with poor treatment outcomes, including increased mortality rates. In this literature review, we explore the relationship between ART default and HIV deaths using logistic regression models.

#### 2.2 THEORETICAL FRAMEWORK

Logistic regression analysis is a statistical method used to investigate the relationship between ART default and HIV-related deaths in sub-Saharan Africa. This method estimates the likelihood of an event (HIV death) based on the independent variable values (e.g. ART default). Various studies have employed logistic regression models to explore this relationship. For instance, Geng et al. (2010) found that those who defaulted had a higher risk of death than those who remained in care. Logistic regression models have also been applied to investigate interventions aimed at improving patient retention in ART programs and reducing ART default. For example, Nachege et al. (2015) found that employed patients had higher ART adherence rates than unemployed patients.

The theoretical framework for the logistic regression model is based on Hosmer, Lemeshow, and Sturdivant's (2013) applied logistic regression. The model includes the dependent variable of mortality rate and independent variables of cultural expression, social determinants of health, and

political context. Social determinants of health are based on the World Health Organization's (2019) framework, while poverty is based on the United Nations Development Programme's (2019) definition. The variable of cultural expression is based on the United Nations Educational, Scientific and Cultural Organization's (2020) concept of culture and development, and the political context variable is based on the United Nations' (2015) 2030 Agenda for Sustainable Development. By utilizing this theoretical framework, policymakers and stakeholders can develop targeted interventions to address the factors that contribute to mortality rates in Zimbabwe.

### **2.2.1. Prevalence of Art default among HIV positive individuals**

Globally, the prevalence of ART default among people living with HIV varies widely depending on the region and the population studied. According to a systematic review and meta-analysis conducted by Nachega et al. (2014), the overall pooled prevalence of ART default was 19.1%, with a range of 3.6% to 46.8%. The study included 102 studies from 39 countries, and the prevalence of ART default was highest in low- and middle-income countries (LMICs) compared to high-income countries (HICs). The authors also found that factors such as younger age, male gender, substance abuse, depression, and poor social support were associated with increased risk of ART default.

In Africa, the prevalence of ART default among people living with HIV is also high, with estimates ranging from 10% to 50%. A study conducted by Mekuria et al. (2018) in Ethiopia found that the prevalence of ART default was 20.5%, with younger age, lower educational level, and longer duration on ART being significant predictors of default. Another study by Muyingo et al. (2017) in Uganda found that the prevalence of ART default was 10.6%, with factors such as alcohol use, depression, and poor adherence counseling being associated with increased risk of default.

In Zimbabwe, the prevalence of ART default among people living with HIV is also a significant problem. According to the Zimbabwe National HIV and AIDS Estimates (2018), the overall prevalence of ART default was 10.7%, with a higher prevalence among males (12.4%) compared to females (9.2%). The report also found that the prevalence of ART default was higher among younger age groups, with those aged 15-24 having the highest prevalence (17.1%). Factors such

as stigma, transportation costs, and lack of social support were identified as significant barriers to adherence to ART in Zimbabwe.

In conclusion ART default is a significant challenge facing people living with HIV globally, in Africa, and specifically in Zimbabwe. The prevalence of ART default varies widely depending on the region and population studied, with factors such as younger age, male gender, substance abuse, depression, and poor social support being associated with increased risk of default. Addressing these factors through targeted interventions such as adherence counseling, peer support, and mental health services can help to improve adherence to ART and ultimately improve health outcomes for people living with HIV.

### **2.2.2. Relation between Art and Mortality in Zimbabwe**

It has been reported that Zimbabwe has one of the highest HIV prevalence rates in sub-Saharan Africa (WHO, 2022). The use of antiretroviral therapy (ART) has significantly reduced the number of AIDS-related deaths. However, ART default remains a significant challenge, hindering the effectiveness of HIV treatment. A study conducted by Mlambo et al. in 2019 reported that the ART default rate in Zimbabwe was 23.6%. Another study conducted by Chimbari et al. in 2019 reported the ART default rate in the country to be 20%. These studies were part of a meta-analysis conducted by Dlamini et al. in 2020, which analyzed 14 studies and found that the overall ART default rate in Zimbabwe was 19.5%. These rates of ART default have been attributed to various factors such as stigma, side effects of ART, and financial constraints. Efforts have been made to address these challenges through interventions such as community-based adherence support and the provision of free ART. However, more needs to be done to reduce the prevalence of ART default and improve the effectiveness of HIV treatment in Zimbabwe.

### **2.2.3. Effects of Art default duration on mortality rate**

Antiretroviral therapy (ART) is essential for HIV-positive individuals to maintain their health and suppress the virus. Defaulting from ART can lead to negative consequences, including the development of drug resistance, treatment failure, disease progression, decreased quality of life, increased risk of infecting others, and even death. Studies have shown that long-term ART default is associated with higher mortality rates among HIV-positive individuals, and non-adherence to

ART among adolescents and young adults can result in suboptimal treatment and increased mortality rates.

Several factors contribute to ART defaulting, including lack of employment opportunities, migration, cultural and religious beliefs, intimate partner violence, inaccessibility of healthcare centers, lack of accurate knowledge about HIV, and financial challenges. Depression has also been identified as a critical reason for defaulting ART.

Zimbabwe has a significant number of people living with HIV, and ART default rates are a significant concern. Efforts should be made to reduce ART default rates through targeted interventions, such as improving access to healthcare centers, providing accurate information about HIV, and addressing the financial challenges that many HIV-positive individuals face. It is crucial to consider the socio-economic, interpersonal, behavioral, and psychological components of HIV/AIDS and to address the stigma attached to HIV infection and alcohol consumption, which may hinder health-seeking behavior among people living with HIV/AIDS.

#### **2.2.4 RISK FACTORS FOR ART DEFAULTING**

AIDSinfo (2015) states that antiretroviral drugs (ARVs) are the only approved medications that can suppress viral replication, improve immunological outcomes, reduce the risk of developing drug resistance, and have been scientifically proven to reduce HIV/AIDS-related morbidity and mortality. ART has been a crucial tool in reducing HIV-related mortality worldwide. However, HIV/AIDS is not merely a biomedical phenomenon but a disease that includes socio-economic, interpersonal, behavioral, and psychological components. Stigma attached to HIV infection and alcohol consumption can hinder health-seeking treatment among people living with HIV/AIDS. Zimbabwe had an estimated 1.3 million people living with HIV in 2020, according to the World Health Organization (WHO), and ART default is a significant concern in Zimbabwe as it can lead to treatment failure and subsequent morbidity and mortality. Mushavi et al. (2017) found that the overall ART default rate in Zimbabwe was 10.1%, with patient relocation and drug stockouts being the primary reasons for default. Factors such as lack of employment opportunities, migration, cultural and religious beliefs, intimate partner violence, and inaccessibility of health care centers have contributed to ART defaulting in countries such as Uganda, South Africa, Kenya, and Zimbabwe. Inaccurate knowledge about HIV, fueled by traditional healers in most African countries, has led to many HIV/AIDS patients holding false beliefs about being bewitched. Depression has also been reported as a significant reason for ART defaulting. Ehlers and Tshisuyi (2015) found that depression was one of the top three reasons why respondents missed ARV doses in their study of ART adherence among 300 ART patients in rural Botswana.

#### **2.2.5. Factors that increases the risk of HIV mortality**

According to the World Health Organization (WHO), the factors that increase the risk of HIV mortality include:

1. Being diagnosed with HIV infection late is linked to higher mortality risk. In 2019, only 53% of people living with HIV in low and middle-income countries knew their serostatus. Additionally, several studies have shown that starting antiretroviral therapy (ART) late is associated with higher mortality risk.

2. Poor access to healthcare: Lack of access to healthcare services, including ART, is associated with increased mortality risk. In addition, a low CD4 count at the time of ART initiation is associated with a higher risk of mortality.

3. Co-infections: Infections, such as tuberculosis (TB), malaria, and hepatitis, are major causes of illness and death among people living with HIV. Co-infections can lead to poorer health outcomes and increase mortality risk in individuals living with HIV.

4. Substance abuse: Substance abuse, including alcohol and intravenous drug use, is associated with increased mortality risk in people living with HIV. Substance abuse has been found to be a contributing factor to inadequate adherence to ART, which can lead to suboptimal suppression of the virus.

5. Age: Age is also a factor that increases the risk of HIV mortality, with older adults being at higher risk of mortality.

6. Gender: Some studies suggest that gender may also be a factor that influences the risk of HIV mortality, with women being at higher risk of mortality than men in some populations.

According to the Joint United Nations Programme on HIV/AIDS (UNAIDS), the global estimate of HIV-related deaths declined by 39% between 2010 and 2019. However, in 2019, there were still 690,000 HIV-related deaths globally.

#### **2.2.6. Identification and support of Art defaulters**

Art defaulter is defined as an HIV-positive person who has missed an ART refill for two or more months, or who has discontinued ART altogether. ART defaulters are at an increased risk of treatment failures, developing drug resistance, opportunistic infections, and HIV-related death.

Identification and support of ART defaulters are vital for sustaining the gains made in the fight against HIV. A comprehensive and effective approach to identifying and supporting ART defaulters includes several steps. One is tracking and monitoring ART refill patterns to identify those who have missed their refills. This step can be achieved through methods such as phone calls, SMS messages, or home visits. Another step is strengthening adherence counseling and support for ART defaulters. This includes addressing the root causes of the defaulting behavior,

providing education and counseling on the importance of ART adherence, and developing individualized adherence plans.

Studies have shown that identifying and supporting ART defaulters can help to improve ART adherence rates, reduce morbidity and mortality, and increase the overall efficacy of HIV treatment programs. For instance, a study conducted in Zimbabwe found that the reintroduction of ART to ART defaulters reduced their risk of mortality by 72% (Gardner et al., 2014). Another study carried out in South Africa demonstrated that the use of a community-based intervention to trace and assess ART defaulters led to a significantly higher return to care and viral suppression, compared to standard care (van Zyl et al., 2017).

In Zimbabwe, the identification and support of ART defaulters have gained high momentum over the years due to the high number of defaulters recorded. UNAIDS reports that as of 2020, Zimbabwe had a total of 1.3 million people living with HIV, with 74% of these individuals receiving ART treatment. However, the country has grappled with increasing cases of ART defaulting, with about 37% of all individuals on ART failing to achieve viral suppression (UNAIDS, 2020). This shortfall stresses the need to implement effective strategies for identifying and supporting ART defaulters in Zimbabwe.

### **2.2.7. Strategies to improve treatment adherence**

Studies in Greece conducted by Zampetakis and Melas (2020), recommended for the design and implementation of public health campaigns for ART which should be organized at different levels that shape people's intentions to adherence. Zampetakis and Christos Melas (2020), also further recommended that policymakers should take this under consideration to achieve better ART adherence results to reduce HIV mortality, since ART is the only powerful prevention tool against HIV pandemic as well as the mortality. This resonates with Freire (1973) on community concietization in a bid to sensitize them so that they are aware of ART adherence benefits.

In an anthropological research conducted in West Africa, there is notably the absence of communication on ART adherence by national health authorities and social dialogue on response strategies facilitating beliefs in alternatives ways to overcome HIV infection and the misunderstandings surrounding the controversial ART. Desclaux (2020), chronicles that community members maintains a favorable view of myths such as sleeping with Albinos which is an inexpensive and non-discriminatory way than adhering to ART. Similarly, those in Uganda who



were HIV positive were hesitant because they believe in herbal treatment more than ART, Africa CDC (2021). Moreso, preferences for herbal treatment were also evident in Uganda, Kasozi et al (n.d). This coincides with Dinga et al (2021) who claims that the role of herbal treatment was also evident in Cameroon. Dinga et al (2021) posits that “I have seen on TV that Africans don’t need an ART since there are herbal cures for the disease”. This is in tandem with another study by Mavhunga (2021) which was conducted in Zimbabwe which showed that some people were not adhering to ART since some churches had introduced some treatments such as “Aguma” drug which was however not tested by the WHO board. This therefore signifies the need for information dissemination by health authorities so that there is ART adherence.

Consequently, community-based follow-up were also among the key strategies in Uganda to improve ART adherence. A randomized controlled trial in Uganda found that community-based ART delivery with home visits and group meetings led to a 35% reduction in ART defaulters and a 27% reduction in mortality compared to facility-based care (Chang et al., 2015).

Another study conducted in Uganda evidenced the targeted adherence support. The systematic review and meta-analysis found that targeted adherence support interventions, such as mobile phone reminders or counseling sessions, improved ART adherence by 11% compared to usual care (Nachega et al., 2014). Another randomized controlled trial in Tanzania found that weekly text message reminders improved ART adherence by 12% compared to usual care (Haberer et al., 2012). This resonates with studies from Zimbabwe which also yielded the same findings. A cohort study in Zimbabwe found that weekly home visits by trained community health workers improved ART adherence by 11% and retention in care by 17% compared to standard care (Mavhu et al., 2018).

Community-based follow-up. A cohort study in Malawi found that community ART groups led by trained lay health workers improved ART adherence by 10% and retention in care by 20% compared to standard care (Chimwaza et al., 2014). This coincides with another study from Zimbabwe which also showed the same findings of community-based follow-ups. A randomized controlled trial in Zimbabwe found that community ART groups led by trained lay health workers improved ART adherence by 13% and retention in care by 18% compared to standard care (Mavedzenge et al., 2018).

The Improved patient education findings from Kenya was also among the key. A randomized controlled trial in Kenya found that a multimedia education program improved ART adherence by 9% compared to standard care (Lester et al., 2013). A randomized controlled trial in South Africa also found that a peer-led education and counseling intervention improved ART adherence by 7% compared to standard care (van Loggerenberg et al., 2015). Another similar study was undertaken in Zimbabwe and yielded similar results. A cohort study in Zimbabwe found that a peer-led education and support program improved ART adherence by 9% and retention in care by 14% compared to standard care (Mukumbang et al., 2019).

### **2.3 CONCEPTUAL FRAMEWORK**

Zimbabwe, a country in Southern Africa, has been facing various challenges in recent years, including economic instability, political unrest, and a lack of investment in the arts. This conceptual framework aims to explore the relationship between Art Default and Deaths in Zimbabwe, and how cultural expression and social determinants of health may impact this relationship. Art Default refers to the lack of funding and support for the arts in Zimbabwe. The government's failure to invest in the arts has resulted in limited opportunities for artists to showcase their talents and limited access to resources such as studios, equipment, and training. This lack of investment has impacted cultural expression and overall well-being in Zimbabwe.

*Cultural Expression.* Cultural expression is an essential aspect of social determinants of health. It is the way people express themselves through art, music, dance, and other forms of creative expression. Cultural expression contributes to positive health outcomes by promoting social cohesion, reducing stress, and improving mental health.

*Deaths.* Zimbabwe has a high mortality rate due to preventable diseases, accidents, and violence. The lack of investment in healthcare and infrastructure has contributed to this problem. In addition, the lack of investment in cultural expression may also be contributing to negative health outcomes and higher mortality rates.

*Social determinants of health.* Refer to the environmental and social factors that affect individuals from birth to old age. These factors include poverty, access to education, healthcare, and social support networks. Social determinants of health are known to have a significant impact on health outcomes

*Political Context.* The political climate in Zimbabwe has been unstable for many years. Government policies and practices have contributed to the lack of investment in the arts and healthcare. The government's focus on other priorities has resulted in limited resources being allocated to these critical areas.

*Relationship between Art Default and Deaths.* The lack of investment in cultural expression may contribute to negative health outcomes and higher mortality rates. Cultural expression promotes social cohesion, reduces stress, and improves mental health. Without access to cultural expression, people may experience more stress, anxiety, and depression, which can lead to negative health outcomes.

*Conclusion.* In conclusion, the conceptual framework has explored the relationship between Art Default and Deaths in Zimbabwe. The lack of investment in cultural expression may contribute to negative health outcomes and higher mortality rates. It is essential to consider cultural expression and social determinants of health when analyzing health outcomes in Zimbabwe. The government must invest in the arts and healthcare to improve the well-being of its citizens.

## **2.4. EMPIRICAL LITERATURE**

The extensive empirical literature on the connection between ART default and HIV-related deaths underscores the significance of adherence to ART in decreasing mortality rates in HIV patients. Various studies have explored the factors that influence adherence to ART and the consequences of poor adherence. For example, Nachega et al. (2007) discovered that adherence to non-nucleoside reverse transcriptase inhibitor-based HIV therapy was linked to better virologic outcomes, indicating that adherence is crucial for successful treatment outcomes. Mills et al. (2006) identified patient-reported obstacles and facilitators to adherence, such as medication side effects, comorbidities, and psychosocial factors, highlighting the need for interventions that target these barriers. Amico and Fisher (2006) also found that inadequate adherence was associated with an increased risk of viral resistance, disease progression, and mortality, underscoring the importance of adherence in preventing negative outcomes. Chesney (2000) identified similar factors that affect adherence and the need for interventions to address them. Finally, Lima et al. (2009) discovered that improved adherence was associated with reduced mortality rates, highlighting the importance of addressing barriers to adherence and improving access to treatment. Overall, these studies provide valuable insights into the relationship between ART default and HIV

deaths, emphasizing the need for effective interventions to enhance adherence and alleviate the burden of HIV/AIDS.

## **2.5. KNOWLEDGE GAP**

The high prevalence of HIV in Zimbabwe has made it necessary to understand the factors that contribute to HIV-related deaths in the country. Antiretroviral therapy (ART) is a critical component of HIV treatment, but ART default is a common problem in Zimbabwe. Several studies have explored the relationship between ART default and HIV outcomes in Zimbabwe, with most focusing on mortality rates. However, there is a need for more studies that examine other health outcomes and the factors that contribute to ART default among different populations. The current study aims to address these gaps by using a logistic regression model to explore the relationship between ART default and HIV deaths in Zimbabwe. The study will also examine the factors that contribute to ART default among HIV-positive patients in Zimbabwe.

### **2.5. Definition of terms**

**Antiretroviral therapy (ART):** A treatment for HIV that involves the use of medications to suppress the virus and prevent progression to AIDS.

**Logistic regression models:** Statistical methods used to explore the relationship between a dependent variable, such as ART default, and one or more independent variables, such as depression, stigma, and alcohol use.

**ART default:** It is defined as the failure to take ART medications as prescribed, leading to a break in treatment continuity (Nachega et al., 2010). It also refers to missing medication for more than 30 days.

## **2.6. CHAPTER SUMMARY**

Logistic regression models have been used to explore the relationship between ART default and HIV deaths. Studies have consistently found that patients who default on ART have a higher risk of mortality compared to those who remain in care. Predictors of ART non-adherence, such as depression, stigma, and alcohol use, have been identified through logistic regression models. The Health Belief Model provides a theoretical framework for understanding the reasons behind ART

default. However, there is still a knowledge gap in identifying interventions that can improve treatment outcomes and reduce mortality rates among those who default on ART in Zimbabwe.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.0 INTRODUCTION**

This chapter is focused on giving a detailed account and explanation of the research methodology. The focus will be on the research design used by the researcher that guides the overall research, the research instruments used for data collection, sampling technique used for selecting samples from the research population. The chapter will also look into data collection procedures, data presentation and analysis procedures and ethical considerations.

#### **3.1 RESEARCH APPROACH**

Every research follows a clearly stated procedure and guidelines. Research approach is defined by Creswell and Creswell (2018) as the procedures or procedure recognized and applied in carrying out research, with qualitative approach, quantitative approach and mixed methods being the commonly used approaches. Out of the three approaches the mixed methods research approach was adopted by the researcher. The reason behind the use of the mixed methods was due to its fact of combining both qualitative and quantitative approach. Qualitative research approach is explained by Creswell (2014) as a procedure used to explore the meaning and explanations people

accredit to a given scenario. In the same vein Jones (1998) propounded that qualitative research gives a satisfying explanation and view of a social phenomenon. On the other hand quantitative examines the relationship between different variables. Thus combining the two approaches the research was able to utilise the strengths of both approaches obtain high richness and quality in data. It is against this background, that the researcher sought to explore the relationship between ART default and HIV deaths in Zimbabwe. Thus the use of mixed methods research was therefore necessary and justifiable as it enabled the researcher to capture both subjective and objective views of different people on the research focus on the relationship between ART default and HIV deaths in Zimbabwe. More so, mixed methods facilitated great research validity through substantiation of quantitative and qualitative data.

### **3.2 RESEARCH DESIGN**

Kothari (2004) suggests that the effectiveness of research is determined by the manner in which data is collected. Research design plays a crucial role in shaping the parameters for data collection and analysis. Its primary objective is to ensure that the data collected is relevant to the research objective and that it is collected efficiently. In this study, the researcher adopted a mixed methods approach, specifically the convergent parallel mixed methods design. As defined by Creswell (2014), this approach combines both qualitative and quantitative data to provide a comprehensive analysis of the research problem. The researcher collected both types of data simultaneously and integrated the findings during the interpretation of the overall results. To collect quantitative data, the researcher used closed-ended questionnaires, while qualitative data was gathered through interviews.

### **3.3 STUDY SETTING**

One can define the study setting as the vicinity or location in which a research study is carried out. This study was carried out in Harare at Parirenyatwa Group of Hospitals (PGH) mainly due to the proximity with the researcher. Harare is the capital city of Zimbabwe and a considerable population of people lives there. Due to its status as the major hospital in Zimbabwe it has multiple health care services where people seek help which made it easier for the researcher to visit the institutions to enquire about the research objectives.

### **3.4 TARGET POPULATION**

A target population can be viewed as people with desired research characteristics from whom the researcher gathers data. Bhattacharjee (2012) purports that, a target population consists of people with characteristics that the researcher is looking for in research. From the research focus, since this research was aimed exploring the relationship between antiretroviral therapy (ART) in Zimbabwe utilising Parirenyatwa Group of Hospitals as the case study. The researcher used fifteen health care workers or professionals from Parirenyatwa Group of Hospitals (PGH) due to their experience and knowledge in HIV treatment as the biggest referral health care Centre in Zimbabwe. Health care workers such as nurses and doctors have direct knowledge on ART uptake or defaulting by patients thus it was justifiable to use them as the target population as they have technical knowhow of HIV positive patients who default from taking ART. The researcher also targeted three key informants from Zimbabwe Aids Network, National Aids Council and SAT Zimbabwe due to their specialization on HIV and AIDS in health care delivery.

### **3.5 SAMPLING**

Throughout time immemorial it has always been practically impossible to study the whole population at once, as such sample representations have been used as an alternative. Just likewise this research also utilized population samples obtained through sampling. The researcher being fully aware that there are two major sampling techniques probability sampling and non-probability sampling, sought to do justice to the research approach of mixed methods. As a results concurrent mixed methods sampling which is the use of both probability and non-probability techniques simultaneously. This position is supported by Charles and Fen (2007) who argued that in concurrent mixed methods sampling, random and purposive sampling techniques are used simultaneously. In selecting the samples the researcher followed the probability- non-probability or the quantitative then qualitative route. The researcher applied a random sampling technique at the beginning to increase research external validity where 50 health workers at Parirenyatwa Group of Hospitals were assigned equal probability of inclusion. Due to the nature of the research which sought to establish the relationship between ART default and HIV deaths in Zimbabwe utilising Parirenyatwa as the case study, the researcher utilized nonprobability sampling to get 15 participants who were willing to participate in the study after initially assigning 50 target using random sampling. Snowballing was used were respondents were asked to refer the researcher to some participants who had full knowledge on ART default and HIV deaths until the researcher

had 15 willing participants. The use of snow balling was as a desired to improve internal consistency and validity. Purposive sampling was also used in selecting three key informants based on their knowledge on the subject matter.

### **Inclusion criteria**

- Health care worker
- Willingness to participate in the research
- Working knowledge in HIV and AIDS strata

## **3.6 DATA COLLECTION PROCEDURES AND RESEARCH INSTRUMENTS**

The success of any research is dependent on the collection of relevant data using relevant tools. The data collection methods used include survey and interviews. With these data collection methods, various tools such as questionnaires and interview guides were used in the data collection process.

### **3.6.0 Survey**

The researcher conducted a survey at Parirenyatwa Group of Hospitals, which provided quantitative information about trends or opinions of a population by studying a sample. The survey was a cross-sectional study that used questionnaires to collect data, with the intention of generalizing the findings from the sample to the wider population.

### **3.6.1 Questionnaire technique**

According to Bhattacharjee (2012), a questionnaire is a research tool commonly utilized to gather quantitative data in a uniform manner through a set of questions. In this particular study, the researcher administered the questionnaires to the respondents and divided them into two sections. The first section focused on demographic information such as age, gender, education level, and professional experience regarding HIV treatment, while the second section captured the respondents' opinions on the effects, reasons, risk factors, and potential solutions related to ART defaulting. Closed-ended questions were used for easy data coding, and the questionnaires ensured the confidentiality of the respondents' identities while collecting classified information. However, despite the usefulness of questionnaires, they had some limitations such as low response rates and the inability to observe nonverbal communication to validate response congruency. The questionnaire used is in the appendices section, annex 2.



### 3.6.2 Interviews

The researcher also used interviews for data collection as there were more personalised or individualized way of gathering data since it allowed face to face interactions. The interviews captured data on the relationship between ART defaulting and HIV mortality. The interviews were done with the key informants and a key informant interview guide was used which consisted of questions which the researcher used for the interviews. The use of interviews was justifiable since they allowed the researcher to observe nonverbal communication, unlike questionnaires the researcher managed to authenticate responses through matching the congruency of what the interviewee said versa the nonverbal cues. More so the researcher was also able to proffer responses and seek clarifications through the use of the reflection technique whereby the researcher utilised the psychoanalysis trick of repeating what the interview said and paused and wait for the interviewee to explain further. Silent probing was also used where the researcher would just pause and wait without proceeding to the next question, during silent probing interviewees will add more information. Overt encouragement was also used without either approving or disapproving the response but indirectly encouraging the interviewee to shed more information through using phrases like *uh huh*. Key informant interviews and in-depth interviews were used by the researcher.

#### 3.6.2.0 Key informant interviews guides

Key informant interview guides were used to interview the key informants who are knowledgeable individuals, willing to participate and had great understanding of the association between HIV deaths and ART default. The interview guides consisted of all interview questions which sought to generate data on causes of ART defaulting, relationship or link between defaulting from ART and HIV related deaths, the impact of ART defaulting on HIV positive individuals and lastly it consisted of questions on the recommendations or measures which can be adopted to encourage treatment adherence. Three key informant interviews were done through face to face.

#### key informants interviewed

Stakeholders	Key informant	Frequency
SAT (SRHR Southern Africa Trust)	Program officer	1
NAC (National Aids Council)	Program Officer	1

ZAN (Zimbabwe Aids Network)	Outreach Officer	1
Total		3

*Table 1 showing list of key informants*

### **3.7 DATA PRESENTATION AND ANALYSIS PROCEDURES**

The researcher utilized thematic and graphical presentation of data, qualitative data was thematically presented and on the other hand quantitative data was graphically presented. Concurrent triangulation was the major procedure used by the researcher through presenting quantitative data first as well as analyzing it, followed by qualitative data analysis. Quantitative data from the survey was analyzed using SPSS version 20 and Microsoft excel. After data entry into SPSS the researcher then analyzed the data, using univariate descriptive analysis on variables of interest to the researcher. Cross tabulation was also done on various variables to see the association between different variables of the research. The analysis output which was mainly tables and graphs was used for presentation and analysis.

To analyze the qualitative data the researcher did qualitative data organization which involved transcribing of interviews and data assembling. Afterwards the researcher did general through over reading of the data to have a general understanding and appreciation of the data set upon which classification of the data was done accordance to different themes or codes through data coding. Different forms of data coding such as open coding, axial coding and selective coding where used by the researcher. Open coding was done in identifying concepts on key ideas and putting them into themes. Axial coding was done to assemble themes into casual relationships that can explain the phenomenon of interest. Selective coding was done to identify central themes and systematically relating it to other themes.

### **3.8 ETHICAL CONSIDERATIONS**

Social research should abide to research ethics as such this research considered a number of ethics. Ethics can be viewed as the bible or manual of research upon which all ethics should be adhered to. The following ethics were observed.

#### **3.8.1 Voluntary Participation**

Voluntary participation in a research means that research participants participate through personal choice without being forced or coerced to do so. The researcher explained the entire research to the participants and give the participants the opportunity to decide to participate or not. The participant's rights for research participation and those who voluntarily participated where given an informed consent to sign.

### **3.8.2 Informed Consent**

The researcher offered a summation of the study in order for the research participants to be fully aware of the study. The researcher made sure everyone was aware of what was going on before the study commenced and a written informed consent form was given to everyone who give their permission to participate. The researcher made it clear that at any given time anyone can withdraw from the study if need be.

### **3.8.3 Confidentiality**

The researcher deleted all participant information such as identifying particular as a way to keep the identity of the participants hidden. The ethic of confidentiality proposes that participant's information should be kept private and no identifying information can be linked with any response. This was achieved through the use of pseudo names. The researcher also made sure the information was kept safe and inaccessible to anyone in order to maintain confidentiality.

### **3.8.3 Do No Harm**

The researcher made sure that no harm befall participants either through participation or nonparticipation in the study.

### **3.8.4 Accurate reporting**

This ethic dictates that results should be reported accurately. This ethic was achieved through accurate presentation of results as they were.

### **3.8.5 Respect for Intellectual Property**

This ethic entails that all copyrights and other types of intellectual property must be respected and honoured. As a result the researcher acknowledge all intellectual property and copyrights through

citation wherever other people's information was used. Referencing of the cited data sources was also done.

### **3.9 CHALLENGES FACED**

The researcher faced a number of challenges in carrying out the research, these challenges includes:

- The researcher faced resistance from participants. However, the researcher managed to resolve the challenge through explaining and clarifying the purpose of the study and its benefits to the general population.
- Mistrust was another challenge faced due to the nature of the data sought some participants had trust issues with the researcher. The researcher sought to establish trust with the participants through producing the national identity document, student identity card and research letter from the department.
- Financial challenges to meet transport cost to and from research site, printing of research materials was also faced. The researcher managed to resolve this challenge through borrowing funds from friends to make sure that the research runs smoothly.

### **3.10 SUMMARY**

The main purpose of this chapter is to provide a comprehensive description and clarification of the research methodology. The chapter emphasizes the research design that directs the entire research, the research tools employed for gathering data, the sampling method used for selecting participants from the target population. Also, the chapter discusses the methods for collecting and presenting data, analyzing the data, and ethical issues.

## **CHAPTER FOUR**

### **DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS**

#### **4.0 CHAPTER INTRODUCTION**

The validity of any research is based on the presentation, analysis and discussion of findings. It is from this stand point that this chapter is geared towards the presentation, analysis and discussion of research findings on the on the relationship between ART default and HIV deaths in Zimbabwe. The researcher utilized thematic and graphical presentation of data, qualitative data was thematically presented and on the other hand quantitative data was graphically presented. Concurrent triangulation was the major procedure used by the researcher through presenting quantitative data first as well as analyzing it, followed by qualitative data analysis.

#### **4.1 DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS**

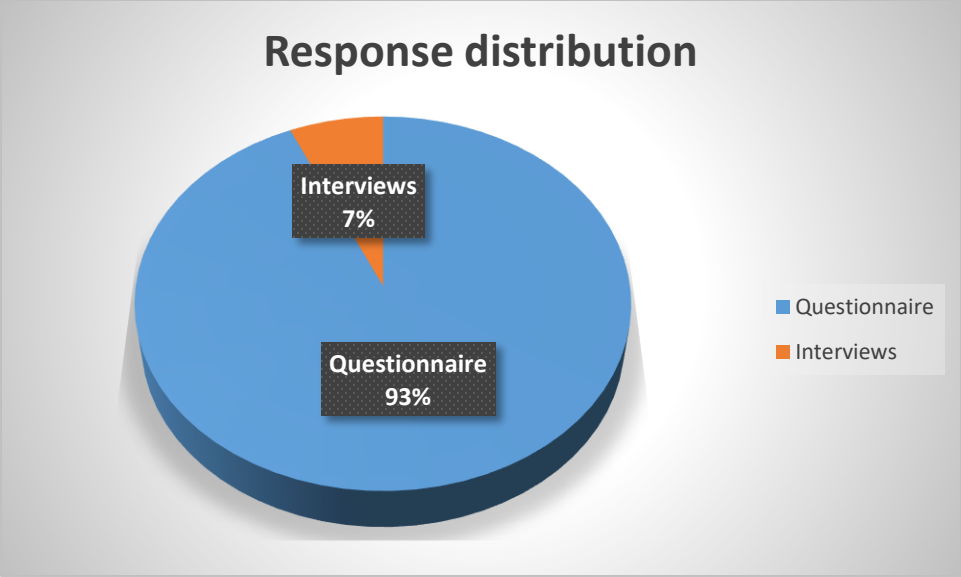
The participants chosen by the researcher had diverse demographic characteristics. Therefore, this section provides a summary of the demographic features of the participants, with a specific focus on variables such as gender, age, level of education, and professional experience. The research was dominated by females who constituted 66.7% while the remaining 33.3% were males. On age distribution the most represented age group was those above 41 years which had over 46% while the least represented was those below 30 years with only 20% of the participants from that age group. On academic qualifications the majority of participants or respondents had at least an undergraduate degree. It is also important to notice that professional experience directly correlates with the age of the respondent, 46.7% of respondents had more than 10 years of experience likewise the same percentage correlates with those above 41 years of age on the other hand only 20% had less than 5 years of experience.

## Demographic data of research participants

Description of variable	Label	Frequency	Percentage
Gender	Male	5	33.3%
	Female	10	66.7%
	Total	15	100%
Age	Below 30 years	3	20%
	31-40 years	5	33.3%
	41 and above years	7	46.7%
	Total	15	100%
Academic qualifications	Diploma level	2	13.3%
	Undergraduate degree level	8	53.4%
	Postgraduate degree	5	33.3%
	Total	15	100%
Professional experience	Less than 5 years	3	20%
	5-9 years	5	33.3%
	More than 10 years	7	46.7%
	Total	15	100%
Institution of key informants	SAT	1	33.3%
	NAC	1	33.3%
	ZAN	1	33.3%
	Total	3	100%

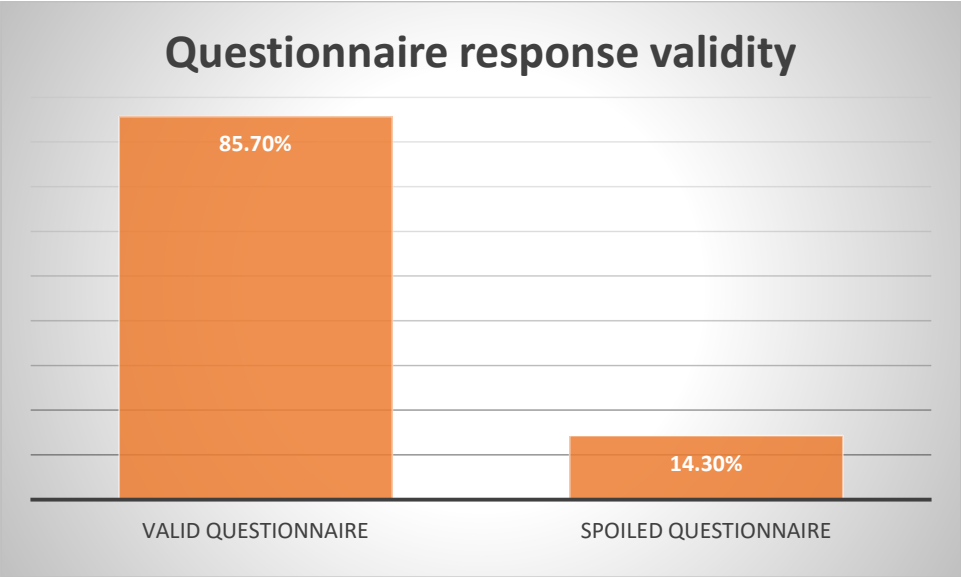
Table 2 showing demographic distribution of the study

## Response rate



*Fig 1 showing response distribution*

The majority of the participants responded to the questionnaire survey as shown by the table above were 93% percent responded while 7% opted for interviews. Despite the high preference for questionnaire it also had 14.3% invalid or spoiled responses thereby giving only 85.7% response rate validity as demonstrated by the fig below.



*Fig 2 showing questionnaire response validity.*

## **4.2 RELATIONSHIP BETWEEN ART DEFAULT AND HIV MORTALITY IN ZIMBABWE**

Measuring the relationship between defaulting from taking antiretroviral medication and HIV deaths in Zimbabwe was the major aim of the research which was necessitated by the lack of such in the public sphere. The study managed to review that more than 20% of HIV positive patients on ART treatment default the treatment. One key informant argued that:

*‘ART default is prevalent among HIV positive individuals are who in denial, living in areas which are far from health care institutions. Many if they run out of medication they tend to default due to shortage of transport to and from resupply’ (Key Informant 2).*

This view was supported by another participant revealed that:

*‘It’s a common phenomenon to default from taking ART especially in geographically remote areas. Nationwide more than 20% default from ART. Some of the reasons perpetuity default are religious beliefs and perceived HIV healing. Many prophets claim to heal HIV and once a congregant has been given a perceived healing miracle they default without visiting the clinic to authenticate if they are HIV free. You know the danger is most of these people only realize it late and when revisit the clinics it would be too late as most come in death bed and won’t survive’ (Key Informant 1).*

From the above opinions of key informants one can argue that indeed ART default leads to deaths. The findings are also congruent with various studies conducted by various scholars such as a study conducted by Mlambo et al (2019) which reported 23.6% as the ART default rate in Zimbabwe. Chimbari et al (2019) reported the ART default rate in the country to be 20% while Dlamini et al (2020) found that the overall ART default rate in Zimbabwe was 19.5%. All these researches have findings which are similar to that of the researcher although they were some variations.

## **4.3 PREVALENCE OF ART DEFAULT AMONG HIV-POSITIVE INDIVIDUALS IN ZIMBABWE**

Measuring the prevalence rate of antiretroviral therapy defaulting in Zimbabwe among HIV positive individual was the aim of the study. The research revealed that the prevalence was spatial dependent on various factors.



**Cross tabulation of prevalence of ART based on age, education level, geographical area and employment status**

<b>Prevalence of ART default</b>			<b>Response frequency</b>	<b>Response percentage</b>
	<b>Prevalence of ART default</b>	<b>Age</b>	Below 24 years	8
25-50 years			5	33.3%
Above 50 years			2	13.3%
			15	100%
<b>Education level</b>		Primary level	10	66.7%
		Secondary level	4	26.6%
		Tertiary level	1	6.7%
		Total	15	100%
<b>Geographical area</b>		Rural areas	8	53.4%
		Semi urban areas	5	33.3%
		Urban areas	2	13.3%
		Total	15	100%
<b>Employment status</b>	Formally employed	3	20%	
	Informally employed	5	33.3%	
	Unemployed	7	46.7%	
	Total	15	100%	

*Table 3: showing the prevalence of ART default*

The prevalence of ART default was analysed through cross tabulation of various aspects, firstly based on age. Based on age the prevalence of ART default was high among young people below

the age of 24 years as 53.4% of the respondents responded that prevalence is high among young people. One key informant revealed that:

*‘Young people are usually on their prime ages of merry making and enjoying life. Most of these young fellows tend to get oversighted through alcohol drinking which in most cases makes them forget about taking their medications’ (Key informant 2).*

Another key informant revealed that:

*‘Being diagnosed with HIV at a Young age is traumatic and depressing as such most young default due to denial and depression’ (Key informant, 1).*

The results were in line with the research conducted by Ndubuka et al. (2016) that identified depression as a significant factor contributing to ART defaulting. Similarly, Ehlers and Tshisuyi (2015) studied the reasons for poor ART adherence among 300 ART patients in rural Botswana and reported that depression was among the top three reasons why respondents missed their ARV doses. Prevalence of defaulting was found to be low among those aged 50 years and above with only 13.3% of respondents revealing that. The low prevalence of ART default among those above 50 years was attributable to maturity. One informant revealed that

*‘The more one ages and matures the more likely one becomes responsible for their health and adheres to treatment, unlike young people, elders have a strict treatment adherence plan and they easily adhere to their medication thereby low defaulting’ (Key informant, 1).*

These findings point to the fact that age is the major determinant of ART adherence, the young one is the more likely to default one is due to the pressures associated with that age. And the more one grows, the more likely they are to adhere to treatment.

In terms of education level, ART default prevalence was said to be high among people with low education. 66.7% of respondents argued that ART default prevalence is high among people with primary education.

*‘Information is power and lack of information impairs one’s judgement. People with low education level there have low comprehension of the important of ART adherence in fighting against HIV as such there are more likely to believe to disinformation especially*

*religious wise unlike those who are educated thereby defaulting from ART treatment* ‘**(Key informant 1)**).

ART default prevalence was said to be lowest among people with tertiary education (6.7%). The low prevalence was attributed to high thinking capacity as revealed by one informant.

*‘You know sometimes education saves people from a lot of things, people who are high educated tends to be critical thinkers and they don’t easily default from taking ART because they know what is at stake’* **(Key informant 1)**.

The results demonstrate that the level of education is a factor that affects ART default. Additionally, the study found that ART default prevalence was highest in rural areas (53.4%) followed by semi-urban areas (33.3%), according to responses from the participants. This view was supported by key informants who argued that:

*‘Service provision in rural areas is low as such many people in rural areas are stranded when it comes to collection of ARVs at most when they are not in a position to walk long distances or having no transport money for refill they usually default from taking ART. The same applies with semi urban areas all though the prevalence is low compared to rural areas because of better service provision and proximity to urban areas which are hubs of health care facilities’* **(Key informant 2)**.

This view was cemented by another key informant who postulates that:

*‘It’s not a secret that accessibility is the major factor that affect adherence to HIV treatment, when one cannot access clinics they cannot refill their ART supply. It is important to make clinics accessible as much as possible if we are to ensure that HIV positive people do not default from their ART treatment as defaulting has enormous consequences including ART resistance, weakened immune system, decrease in CD4 count and ultimately death. Shortage of clinics and ART refill centres is a ticking time bomb ready to explode any time, it’s important to detonate the bomb by making clinics accessible to remote areas before the bomb explodes’* **(Key informant 3)**.

In light with the findings one can argue that the more health care services are in an areas the less likely that population are to default from ART. This gives impetus to why only 13.3% people in urban areas default (the lowest geographical prevalence).

When it comes to prevalence of ART default in relation to employment status, the prevalence was lowest among the formally employed (20%). This was attributed to availability of resources to go for refills.

*‘Formally employed people usually have the financial capacity to go for refills as opposed to those who are not employed thus it logically makes sense why there is low ART default prevalence among formally employed people ‘(Key informant 1).*

Highest ART default rate was among those who are unemployed (46.7%) followed by those who are informally employed (33.3%). This view was supported by key informant who posits that:

*‘Most people who default from ART they do so due to lack of financial resources as such they tend to focus more on looking for ways to find money to feed their families to such extent that they neglect their HIV status needs’ (Key informant 3).*

The findings were consistent with the findings of Wasti, Randall, Simkhanda, and Teijlingen (2012) argued that lack of financial resources causes many to default from ART.

### **Causes of ART defaulting**

The researcher also sought to investigate the causes of defaulting from ART and the following data was gathered.

#### **THE CAUSES OF ART DEFAULT**

Factor	Response frequency	Percentage
Inaccessible health centre	5	33.3%
Running out of pills	2	13.3%
Discrimination and stigma	3	20%

Religious and cultural believes	4	26.6%
Other	1	6.7%

Table 4: showing the causes of ART default

Discrimination and stigma were also pinpointed at 20%, with one key informant arguing that:

*‘Most people who are HIV are stigmatized and discriminated against and commonly name calling become a norm with various names like, chigulani, jusa, muzvezvere among others. As a result many default from taking medication so that they are not discriminated against’.*

**(Key informant 3).**

It is clear that from the findings discriminating and stigmatising people against their HIV status influences many to default from taking ART so as to disassociate themselves from stigma associated with HIV. It is therefore imperative for community members to be sensitized on HIV in order to reduce stigma and discrimination. Thus also minimising the number of people defaulting from taking ART.

On the other hand 13.3% also argued that running out of medication. Most people who default from taking their medication live in geographically secluded areas as such fail to afford the cost for refill. The running out of medication is also strongly linked to accessibility of clinics. ART defaulting was linked with inaccessible health centre as 33.3% of respondents concurring that indeed accessibility is the major factor that influence treatment adherence. Thus in simple one can argue that if they cannot access then they cannot adhere.

This view is supported by another key informant who reviewed that:

*‘It’s not a secret that accessibility is the major factor that affect adherence to HIV treatment, when one cannot access clinics they cannot refill their ART supply. It is important to make clinics accessible as much as possible if we are to ensure that HIV positive people do not default from their ART treatment as defaulting has enormous consequences including ART resistance, weakened immune system, decrease in CD4 count and ultimately death. Shortage of clinics and ART refill centres is a ticking time bomb ready to explode any time, it’s important to detonate the bomb by making clinics accessible to remote areas before the bomb explodes’* **(Key informant 3).**

The results are similar to those found by Wasti, Randall, Simkhanda, and Teijlingen (2012), who discovered that limited availability of ART sites in rural areas causes individuals to travel long distances to and from treatment sites, resulting in non-adherence to treatment. Ndubuka (2015) also conducted a study that revealed that many participants who defaulted from ART faced financial difficulties, which made it hard for them to afford transportation costs when going to clinics to receive their monthly ARV supplies, leading to defaulting. Religious and cultural beliefs had the second largest backers as one of the major reasons by HIV positive people default from taking their ART medication. This view was supported by a number of key informants who revealed that:

*'Once one became religious it's easier for them to follow religious commands over medical opinions. It's not a secret that Africans are religiously notorious and they take religion seriously once one akapiwa muteuro (one is prayed for) it's likely that they default due to faith on perceived healing powers of their religious leaders. For example here in Zimbabwe one of the prominent prophets made headlines after purportedly discovered the cure for HIV and AIDS and many of his religious followers believed the powers contained in the alleged cure to cure HIV. It's a sad reality that many die due to religious beliefs, wonder why Karl Marx argued that religion is the opium of the masses. It is advisable that people stick to scientifically proven methods in disease control and religious leaders should play a critical role in empowering their followers to follow medical practices'.* **(Key informant 2).**

This view was supported by another key informant who said that:

*'Some of the reasons that perpetuity default are religious beliefs and perceived HIV healing. Many prophets claim to heal HIV and once a congregant has been given a perceived healing miracle they default without visiting the clinic to authenticate if they are HIV free. You know the danger is most of these people only realize it late and when revisit the clinics it would be too late as most come in death bed and won't survive'* **(Key Informant 1).**

The results align with Oku, Oku, and Monjok's (2013) study that identified traditional healers as exacerbating ART defaulting in many African countries, leading to false beliefs among HIV/AIDS patients about being bewitched. Similarly, Kim et al. (2016) suggest that individuals living with

HIV may be misguided by religion, believing that only prayer can cure them. Additionally, Ndubuka's (2015) study in Botswana found that ART defaulters discontinued their treatment when they turned to spirituality and religion as coping strategies.

Lastly only 6.7% believed that other factors might be at play which is practically possible as common factors are not also applicable everywhere. This view points to fact that the reasons outlined by the researcher as the major causes for causing people to default ART are not exhaustive of the reality on the ground.

#### 4.4 IMPACT OF ART DEFAULT

The researcher sought to investigate the impact of ART defaulting on HIV mortality through looking at how defaulting from ART compromise one’s health. The researcher managed to uncover the effects of ART defaulting which include viral resistance, treatment failure and increased risks of opportunistic disease development and progression.

#### EFFECTS OF ART DEFAULTING

Effect	Frequency	Percentage
<b>Viral resistance</b>	6	40%
<b>Treatment failure</b>	4	26.6%
<b>Opportunistic disease development and progression</b>	4	26.6%
<b>Other</b>	1	6.6%

Table 5: showing the effects of ART defaulting

The findings showed that 40% of the participants believed that defaulting from taking antiretroviral therapy results in HIV viral resistance thus most of the patient’s immune system won’t be able to fight the HIV virus since the virus will be resistant to ART even after retaking the therapy thus increased risks of succumbing to the virus.

This view was supported by one key informant who argued that:

*‘Developed ART resistance can happen when HIV positive individuals default to ART. This is problematic as it lead to poor health outcomes for HIV positive individuals thereby*

*increasing mortality risk by over 50% compared to those who never default. The worse thing about HIV drug resistance is that it can be passed to others' (Key informant 1).*

The outcomes are consistent with the discoveries of Nachega et al. (2011), which indicate that HIV drug resistance can be obtained due to deficient adherence to ART, inadequate drug combinations, treatment breaks, and/or suboptimal drug concentrations. This drug resistance can have adverse health consequences for individuals with HIV and can also be transmitted to others, resulting in transmitted HIV drug resistance (Nachega et al., 2011).

It also necessary to notice that despite the widely regarded number one effect of HIV drug resistance, equal number of respondents had balanced opinion on the effect of defaulting as they argued that it leads to HIV treatment failure and increased opportunistic disease development and progression as 26.6% regard the aforementioned factors as concerning. This outcome was also substantiated by key informant who posits that

*'Once one start to default from taking ARVs which suppresses the HIV viral load it is obvious that viral load will increase thus leading to treatment failure of undetectable levels'. (Key informant 3)*

Another informant argued that:

*'The purpose of ART is to control the spread of HIV and safeguard against opportunistic infections which increases the risk of mortality. HIV positive individuals who default are just as risk as those who are not on treatment' (Key informant 2).*

The informant also revealed that:

*'ART default leads to onward transmission of HIV, ART helps to sustain an undetectable viral load which has reduced risk of transmitting HIV to negative partners. Consequently, defaulting to ART weakens the potential for ART to reduce HIV transmission' (Key informant 3).*

Thus from the above data and views of key informant it is beyond any reasonable doubt that ART default is problematic and immensely contribute to death of HIV positive individuals.



## 4.5 STRATEGIES TO REDUCE ART DEFAULT

Having discovered a mixed bag of discernments towards why people default ART which has a detrimental effect on increasing HIV mortality, the following submissions were made by the participants included:

### 4.5.1 Raising awareness from grassroots level to national level and ensure accessibility

Submissions by participants signposted the need for awareness raising from family levels up to national level, since HIV is here to stay and has no cure as yet. This will also be backed with accessibility of the ART medication at any given time by community members. As a recommendation one interviewee suggested that:

*“ini ndofunga kuti hurumende yedu inofanira kunyasodzidzisa vanhu kubva family level kusvika pa national level nezve HIV treatment so that people havaisire panzira mishonga iyi.” (Personally I think that our government should teach people from family level up to national level about HIV treatment so that people won’t default their medication).*

**(Respondent 6)**

To further support this, one key informant also highlighted that:

*‘In my own opinion, I think that since HIV is here to stay, there is need to slot this HIV treatment of ART into our education level system schools at all levels of education be it primary, secondary or tertiary. Just like what is being done to 6 killer diseases. The children will grow up knowing the importance ART adherence and the dangers associated with defaulting ‘(Key informant 1).*

From the above findings, with the signs that HIV pandemic is here to stay since there’s no cure that has been discovered as yet, the need for education on ART adherence from as low as primary levels coupled with accessibility can also be an effective method to try boost ART adherence and prevent default. This is in line with the studies of Pogue (2020) who chronicles that social dynamics in the USA includes low levels of education therefore the need for awareness towards the vaccines so as to sensitize people.

Upon discovering that the health authorities such as Ministry of Health and social media were sometimes disorganized. Since people will be in a state of uncertainty about the future, giving

people self-contradicting stories would exacerbate their mental wellness. So to try and end this problem as well as to avoid future doubts on vaccines, one of the key informants finally disclosed the organization of WHO in terms of information dissemination. Here is what one the key informant had to say:

#### **4.5.0 Health authorities to disseminate evidence based information which does not contradict each other**

Sometimes health authorities are disorganized and its now confusing people. it approves and disapproves vaccines. It should be organized as a governing board for health world-wide.

One key informant also provided that:

*‘The practice by our health authorities, social media haste in making decisions disastrous. But decisions like these need critical analysis before information is published. For example, it was once announced that a certain Christian church in Zimbabwe was now supplying and introduced HIV curing medication Aguma which was allegedly said to cure HIV so some people ended up defaulting from the ART due to their faith in their leader’*  
**(key informant 3).**

From the above provisions, it can be deduced that the confusion of approval and disapproval of vaccines by health authorities should be stopped. This is in line with the recommendation of EMA (2022) that, it is important for companies developing vaccines and social media platforms to generate robust evidence that meets the needs of regulators around the globe. Moreso, European Medicine Agencies needs many detailed studies to confirm that ART is working. As supported also by Bhebhe (2021), there is need for Zimbabwean scientists to carry out clinical studies on the effect recommended the Zimbabwean scientists to conduct clinical studies to vindicate claims about the plant’s potential to reduce maternal mortality, since there is a yawning gap on its effectiveness.

#### **4.5.1 Public Health Campaigns for ART**

Suggestions by participants also signposted the need to introduce the public health campaigns. Public heath campaigns should be conducted at different society levels which should include micro, mezzo and macro level. To support this claim, one of the key informants instigated that:

*‘Throughout human life it has been proven that information is power and power is information. As such, I would suggest that the government conduct some public health campaigns which should even start from as low as family level up to the national level. By so doing this will enlighten people at all institutions on the dangers of defaulting from ART treatment which have ripple effects of increasing HIV mortality rates’.* (Key informant 3).

To corroborate this, another respondent also hinted that:

*“In order to reduce ART default, there must be community health awareness campaigns mumhanharaunda akasiyana siyana odzidzisa vanhu vogara vachiziva zvizere nezve ART nezvayakoshera”*( *In order to reduce ART default, there must be community health awareness campaigns in different communities to teach people so that they will be fully aware about ART and its importance*) (Respondent 4).

From the above findings, it may be concluded that public health campaigns may be a necessary tool to fight ART default since people will be sensitized on the dangers associated with quitting the treatment. This goes hand in glove with studies in Greece which were conducted by Zampetakis and Melas (2020), who recommended for the design and implementation of public health campaigns for ART which should be organized at different levels that shape people's intentions to adherence.

#### **4.5.5 Targeted adherence support**

Suggestions from the respondents also highlighted the need for targeted adherence support in communities, which may also yield positive results if implemented well in societies. To support this claim, one of the participants highlighted that:

*“ini hangu sekufunga kwangu kana tichida kuderedza dambudziko re ART default, panogona kuiswa targeted adherence support in so many ways dzinosanganisa through counselling, texts or kushanyirana mudzimba chaiko”* (Personally I think if we are to decrease the problem of ART default, we need to implement targeted adherence support in so many ways which includes through counselling, texts or home visits) (Key informant 1).

This is in tandem with the provisions from Uganda of a meta-analysis which found that targeted adherence support interventions, such as mobile phone reminders or counselling sessions, improved ART adherence by 11% compared to usual care (Nachega et al., 2014). This also resonates with studies from Zimbabwe which also yielded the same findings through a cohort study in Zimbabwe which found that weekly home visits by trained community health workers improved ART adherence by 11% and retention in care by 17% compared to standard care (Mavhu et al., 2018).

#### **4.5.6 Criminalising HIV disinformation within religious sectors**

The research clearly revealed that religious misinformation and proclaimed HIV healings is one of the key contributors why religious people tends to default from taking their medication. It was recommended that the government should make stiff laws that punish would be offenders who claims to heal HIV without any scientifically backing proof. This view was submitted by one key informant who postulate that:

*In Zimbabwe we a religious free environment which many abuse the freedom accorded through disinformation. It is therefore in the public good to craft anti false HIV dissemination policies to curtail the growing wings of religious leaders who exposing their congregants at due to proclaimed healing powers (Key informant 2).*

From the above findings it is their important to criminalising disinformation about HIV.

#### **4.6 DISCUSSION OF FINDINGS**

This chapter aimed at the data presentation, analysis and discussion of key findings from the study's participants and respondents. These were interviewed, and also completed survey questionnaire. The findings have shown relationship between ART default and HIV mortality in Zimbabwe which showed that over 20% of HIV positive patients on ART tend to default from the treatment. The reasons for the ART default from the findings included discrimination and stigmatization of HIV positive patients who will tend to default from taking ART treatment as they will be trying to run away from stigma and discrimination. Religion was also among the major causes of ART default since African is considered to be one of the most prayerful people, therefore once they join any church they resort to prayer and assume that all the life problems such as HIV can be cured through prayer and fasting which may lead to ART default. As for the strategies to

reduce ART default, the findings confirmed the public health campaigns at different society levels which include the micro, mezzo and macro so that people will be aware of the dangers associated with defaulting from ART. Targeted adherence support was also among the key possible solutions to ART default which is a major problem which has surpassed even 20% of people who are defaulting.

#### **4.7 CHAPTER SUMMARY**

This chapter provided the presentation, analysis and discussion of research findings on the relationship between ART default and HIV deaths in Zimbabwe. The researcher utilized thematic and graphical presentation of data, qualitative data was thematically presented and on the other hand quantitative data was graphically presented. Concurrent triangulation was the major procedure used by the researcher through presenting quantitative data first as well as analyzing it, followed by qualitative data analysis. The following chapter, will provide this study's summary, conclusion, areas for further research, implications for statistics and financial mathematics practice and general recommendations.

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 5.0 INTRODUCTION

After completing the research on the relationship between antiretroviral therapy (ART) and HIV mortality in Zimbabwe using Parirenyatwa Group of Hospitals as a case study. This chapter seeks to offer an overview of the study through summarising it, offering a conclusion and suggesting recommendations based on the research findings on the subject matter. Hence summary, conclusions and recommendations are the key themes of this chapter.

#### 5.1 SUMMARY OF FINDINGS

The goal of this study was to investigate the relationship between ART default and HIV mortality in Zimbabwe and identify strategies to improve treatment adherence and reduce mortality rates among people living with HIV/AIDS in the country. ART is the primary treatment for HIV, and it has been shown to significantly reduce morbidity and mortality among people living with HIV. However, ART default is a major challenge in Zimbabwe, which prompted the researcher to study the relationship between ART default and HIV mortality in Zimbabwe. The study achieved its aim by using three research objectives, namely determining the prevalence of ART default among HIV-positive individuals in Zimbabwe, examining the relationship between ART default and HIV mortality in Zimbabwe, and establishing possible intervention strategies to improve ART adherence. Understanding the relationship between ART default and HIV mortality rates is crucial for developing effective interventions to improve treatment adherence and reduce mortality among people living with HIV. To gather data, the researcher used a mixed methods approach, specifically the convergent parallel mixed methods design. This involved collecting both quantitative and qualitative data simultaneously, with closed-ended questionnaires used to collect quantitative data and interviews used to gather qualitative data. The logistic regression model was employed to analyse the relationship between ART default and HIV deaths in Zimbabwe, where it estimates the probability of an event occurring (in this case, HIV death) based on the values of the independent variables.

The researcher used a sample size of 15 participants and 3 key informants. The research was dominated by females who constituted 66.7% while the remaining 33.3% were males. On age distribution the most represented age group was those above 41 years which had over 46% while the least represented was those below 30 years with only 20% of the participants from that age group. On academic qualifications the majority of participants or respondents had at least an undergraduate degree. It is also important to notice that professional experience directly correlates with the age of the respondent, 46.7% of respondents had more than 10 years of experience likewise the same percentage correlates with those above 41 years of age on the other hand only 20% had less than 5 years of experience. The majority of the participants responded to the questionnaire survey as shown by the table above were 93% percent responded while 7% opted for interviews. Despite the high preference for questionnaire it also had 14.3% invalid or spoiled responses thereby giving only 85.7% response rate

Measuring the relationship between defaulting from taking antiretroviral medication and HIV deaths in Zimbabwe was the major aim of the research which was necessitated by the lack of such in the public sphere. The study managed to review that more than 20% of HIV positive patients on ART treatment default the treatment. The findings are also congruent with various studies conducted by various scholars such as a study conducted by Mlambo et al (2019) which reported 23.6% as the ART default rate in Zimbabwe. Chimbari et al (2019) reported the ART default rate in the country to be 20% while Dlamini et al (2020) found that the overall ART default rate in Zimbabwe was 19.5%. All these researches have findings which are similar to that of the researcher although they were some variations.

The researcher also sought to investigate the causes of defaulting from ART. Inaccessible health centre was the major factor that influence treatment adherence with 33.3% of respondents concurring that indeed accessibility was a huge factor. Religious and cultural beliefs had the second largest backers with 26.6% as one of the major reason why HIV positive people default from taking their ART medication. Discrimination and stigma were also pinpointed at 20%, on the other hand 13.3% also argued that running out of medication and lastly only 6.7% believing that other factors might be at play which is practically possible as common factors are not also applicable everywhere.

Measuring the prevalence rate of antiretroviral therapy defaulting in Zimbabwe among HIV positive individual was the main aim of the study. The research revealed that the prevalence was spatial dependent on various factors. The prevalence of ART default was analysed through cross tabulation of various aspects, firstly based on age. Based on age the prevalence of ART default was high among young people below the age of 24 years as 53.4% of the respondents responded that prevalence is high among young people. Prevalence of defaulting was found to be low among those aged 50 years and above with only 13.3% of respondents revealing that. The low prevalence of ART default among those above 50 years was attributable to maturity. These findings point to the fact that age is the major determinant of ART adherence, the young one is the more likely to default one is due to the pressures associated with that age. And the more one grows, the more likely they are to adhere to treatment.

In terms of education level, ART default prevalence was said to be high among people with low education. 66.7% of respondents argued that ART default prevalence is high among people with primary education. ART default prevalence was said to be lowest among people with tertiary education (6.7%). The findings clearly shows that ART default varies with the level of education one possess.

In terms of geographical location the study revealed that ART default prevalence was high in rural areas (53.4%) followed by semi urban areas (33.3%) as per responses from the respondents. In light with the findings one can argue that the more health care services are in an areas the less likely that population are to default from ART. This gives impetus to why only 13.3% people in urban areas default (the lowest geographical prevalence).When it comes to prevalence of ART default in relation to employment status, the prevalence was lowest among the formally employed (20%). Highest ART default rate was among those who are unemployed (46.7%) followed by those who are informally employed (33.3%)

The researcher also sought to investigate the causes of defaulting from ART and the following data was gathered. Discrimination and stigma were also pinpointed at 20%, it was clear that from the findings discriminating and stigmatising people against their HIV status influences many to default from taking ART so as to disassociate themselves from stigma associated with HIV. It is therefore imperative for community members to be sensitized on HIV in order to reduce stigma and discrimination. Thus also minimising the number of people defaulting from taking ART. On



the other hand 13.3% also argued that running out of medication. Most people who default from taking their medication live in geographically secluded areas as such fail to afford the cost for refill. The running out of medication is also strongly linked to accessibility of clinics. ART defaulting was linked with inaccessible health centre as 33.3% of respondents concurring that indeed accessibility is the major factor that influence treatment adherence. Thus in simple one can argue that if they cannot access then they cannot adhere.

The researcher sought to investigate the impact of ART defaulting on HIV mortality through looking at how defaulting from ART compromise one's health. The researcher managed to uncover the effects of ART defaulting which include viral resistance, treatment failure and increased risks of opportunistic disease development and progression. The findings showed that 40% of the participants believed that defaulting from taking antiretroviral therapy results in HIV viral resistance thus most of the patient's immune system won't be able to fight the HIV virus since the virus will be resistant to ART even after retaking the therapy thus increased risks of succumbing to the virus.

Having discovered a mixed bag of discernments towards why people default ART which has a detrimental effect on increasing HIV mortality, the following submissions were made by the participants included: raising awareness from grassroots level to national level and ensure accessibility, Health authorities should disseminate evidence based information which does not contradict each other, Public Health Campaigns for ART, Targeted adherence support and Criminalising HIV disinformation within religious sectors.

## **5.2 CONCLUSIONS**

The research concludes that prevalence of ART defaulting in Zimbabwe is high and determined by several aspects such as geographical location, age and employment status. The reasons for the ART defaulting includes discrimination and stigmatization of HIV positive patients who will tend to default from taking ART treatment as they will be trying to run away from stigma and discrimination. Religion was also among the major causes of ART default since African is considered to be one of the most prayerful people, therefore once they join any church they resort to prayer and assume that all the life problems such as HIV can be cured through prayer and fasting which may lead to ART default. As for the strategies to reduce ART default, the findings confirmed the public health campaigns at different society levels which include the micro, mezzo and macro

so that people will be aware of the dangers associated with defaulting from ART. Targeted adherence support was also among the key possible solutions to ART default

### **5.3 IMPLICATIONS TO STATISTICS AND FINANCIAL MATHEMATICS PRACTICE**

The profession of statistics and financial mathematics through its history has been concerned about the welfare of its clients. It is against this background that this study is vital to the profession as it brings to the fore the problem of ART default which needs to be holistically addressed.

### **5.4 RECOMMENDATIONS**

The impact of any research is based on its recommendations as researches are done to bring issues at the fore of focus and thus it is necessary to come up with recommendations based on the findings. It is against this vantage point that after the completion of the research on the prevalence of ART default that the researcher proffers the following recommendations to different targeted stakeholders.

#### **5.4.1 RECOMMENDATIONS TO THE GOVERNMENT**

Section 75 of the constitution of Zimbabwe makes it clear that everyone has right to health, as a result the following recommendations to the government of Zimbabwe

- Due to the fact that most people who default from ART is as a result of accessible health care facilities, it is recommended that the government should build more health care services in line with section 29 (1) of the constitution which argues that the government should the provision of basic and accessible and adequate health services.
- The government should increase its health budget funding so that adequate resources are availed to the field of HIV management.
- The government should establish community ART information centres.
- The government should enact stiff laws that punish would be offenders who claims to heal HIV without any scientifically backing proof.
- Introduce ART pills which can be taken once a day to reduce pill burden.

- Adoption of a needs based approach towards SRHRS information dissemination and moving away from the legal based approach which is more concerned about the age and no the needs of the person.
- Education curriculum review to introduce ART adherence modules.
- Introduce laws which criminalise discriminating or stigmatising HIV positive people so as to reduce stigma and discrimination.

#### **5.4.2 RECOMMENDATIONS TO HIV POSITIVE INDIVIDUALS**

- Adopting a strict ART adherence schedule or time table
- Form ART collection groups with others living with HIV so that all members can contribute transport money for one person who can collect ART on behalf of the whole group.

#### **5.4.3 RECOMMENDATIONS TO HEALTH CARE WORKERS**

- Conducting awareness campaigns on community sensitisation campaigns on HIV/AIDS
- Conducting community-based follow-up of HIV individuals to ensure adherence.
- Conducting targeted adherence programs through cell phone reminders.
- Conducting patient education on ART adherence.

#### **5.4.4 RECOMMENDATIONS TO RELIGIOUS LEADERS**

- Encourage their followers to adhere to HIV treatment.

#### **5.4.5 RECOMMENDATIONS TO CIVIL SOCIETY ORGANISATIONS**

- Work together with the government to ensure holistic service delivery within the HIV sector.
- Bailing out the government through provision of clinic services when the government fails to offer all the services required.
- Conducting ART adherence community based projects to increase awareness of ART.

## **5.5 AREA FOR FUTURE RESEARCH**

This research focused on the relationship between ART default and HIV deaths in Zimbabwe/ there is also need to conduct future studies on the effectiveness of ART in HIV treatment as this area has not been addressed in this study.

## **5.6 CHAPTER SUMMARY**

The chapter of this section offers the summary, conclusions and recommendations based on the findings of the research on the relationship between ART defaulting and HIV deaths in Zimbabwe using Parirenyatwa Group of Hospitals as the case study.

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## APPENDICES

### ANNEX 1: INFORMED CONSENT FORM

This study sought to assess the relationship between ART default and HIV prevalence in Zimbabwe. Notes will be taken through questionnaires or interviews. The study will ensure maximum confidentiality as such there will be no identifying information in the presentation of data, hence the responses presented will be anonymous. It is also your right to know that your participation is voluntary as such you can withdraw from the research if you no longer want to continue. You are requested to provide any requested information during the researcher and if you need any further explanation about the study, do not hesitate to ask the researcher.

I----- (pseudo/ false name) have been given full information about the purpose of this research. I consented to participate in the study without being forced to do so. The information that I provided is accurate and reliable. I understand that:

1. My participation in this study is voluntary.
2. Information generated from this study will be used for the purposes of this research alone.
3. I may withdraw from the study at any point of time.
4. My personal information such as identity and any identifying information will remain anonymous and confidential.

Signature of Participant \_\_\_\_\_ Date:

Signature of Researcher \_\_\_\_\_ Date:

**ANNEX 2: QUESTIONNAIRE**

I am a final year student at the Bindura University of Science an Education doing a Degree in STATISTICS AND FINANCIAL MATHEMATICS. In partial fulfilment of the requirements of degree, students are required to conduct research studies. This study sought to the relationship between ART default and HIV prevalence in Zimbabwe.

**General instructions**

- 1. Please answer all questions by ticking the appropriate answer.
- 2. You are kindly requested to give accurate and correct answers.
- 3. This questionnaire comprises of 16 questions in total.

**Demographic data**

1. What is your gender?

(1). Male  (2) Female

2. How old are you?

(1) Below 30 years  (2) 31-40 years  (3) 41 and above

3. What is your highest level of education?

(1) Diploma  (2) Undergraduate  (3) Postgraduate

4. Professional experience

(1). Less than 5 years  (2) 5-9 years  (3) Above 10 years

**RELATIONSHIP BETWEEN ART DEFAULT AND HIV MORTALITY IN ZIMBABWE**

5. What is the relationship between ART default and HIV mortality in Zimbabwe?

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**PREVALENCE OF ART DEFAULT AMONG HIV-POSITIVE INDIVIDUALS IN ZIMBABWE**

6. Which age group has high prevalence of ART default?

- (1) Below 24 years  (2) 25-50 years  (3) Above 50 years

7. According to education status, which group of people have high ART default prevalence?

- (1) Primary level  (2) Secondary level  (3) Tertiary level

8. According to geographical location, which group of people have high ART default prevalence?

- (1) Rural areas  (2) Semi-urban areas  (3) Urban areas

9. According to employment status, which group of people have high ART default prevalence?

- (1) Formally employed  (2) Informally employed  (3) Unemployed

**CAUSES OF ART DEFAULT**

10. What are the causes of ART defaulting?

- (1) Inaccessible health center  (2) Running out of pills  (3) Discrimination and stigma (4) Religious and cultural believes  (5) Other

11. What are the effects of ART defaulting

- (1) Viral resistance  (2) Treatment failure  (3) Opportunistic disease development and progression (4) Other

12. What are the possible strategies for reducing ART defaulting?

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THE END

THANK YOU FOR YOUR COOPERATION

### **ANNEX 3: KEY INFORMANT INTERVIEW GUIDE**

Designation of the key informant.....

Interview date.....

1. What is the relationship between ART default and HIV mortality in Zimbabwe?
2. How does the duration of ART default impact HIV mortality rates in Zimbabwe?
3. Are there specific demographic or clinical factors that increase the risk of HIV mortality among those who default on ART in Zimbabwe?
4. What interventions can be implemented to reduce the risk of HIV mortality among those who default on ART in Zimbabwe?
5. How can healthcare providers better identify and support individuals who are at risk of defaulting on ART in order to minimise HIV mortality in Zimbabwe?

**Thank you for your cooperation**

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