

**THE EFFECT OF HIV INFECTION ON MATERNAL MORTALITY AMONG
PREGNANT WOMEN AT MUKONO GENERAL HOSPITAL, MUKONO CHURCH
OF UGANDA HOSPITAL, MUKONO DISTRICT**

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OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE IN SOCIAL WORK OF UGANDA
CHRISTIAN UNIVERSITY**



**UGANDA CHRISTIAN
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DECLARATION

I Sylvia Ajonye Solo declare that the research report submitted in partial fulfillment of the requirements for the award of bachelors' degree in social work and social administration is the result of my own original work. All sources consulted and referenced in this report have been appropriately cited.

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APPROVAL

This is to certify that this research dissertation on the title " The Relationship Between Unemployment and Crime Rate Among the Youth in Nakirebe Village, Mpigi District", was done under my supervision and is now ready for submission and examination as a requirement for the award of the degree of social work and social administration at Uganda Christian University.

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Date: _____

05/05/2026

DEDICATION

I dedicate this research report to my parents for their unwavering love, support, and encouragements have been the driving force behind my academic journey. Their belief in my abilities and constant motivation has been instrumental in helping me overcome challenges and reach this milestone.

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LIST OF ABBREVIATIONS

ART	:	Antiretroviral Therapy
CDCP	:	Centers for Disease Control and Prevention
CHW		Community Health Workers
HBM	:	Health Belief Model
HIV		Human Immunodeficiency Virus
HIV	:	Human Immunodeficiency Virus
HMIS	:	Health Management Information System
MCUH	:	Mukono Church of Uganda Hospital
MDHO	:	Mukono District Health Office
MGH	:	Mukono General Hospital
MoH	:	Ministry of Health
OHC		Osukuru Health Centre
PMTCT	:	Prevention of Mother-To-Child Transmission Programs.
UDHS		Uganda Demographic and Health Survey
UNAIDS	:	Joint United Nations Programme on HIV/AIDS
WHO		World Health Organization

ABSTRACT

The study examined the effect of HIV infection on maternal mortality among pregnant women at Mukono General Hospital and Mukono Church of Uganda Hospital in Mukono District. The study was guided by three specific objectives: to find out the effect of viral load levels on maternal mortality among HIV-positive pregnant women, to examine the influence of access to antiretroviral therapy (ART) on maternal and infant health outcomes, and to assess the effect of HIV infection status on maternal mortality among pregnant women. A sample size of 44 respondents was used, and data were collected using questionnaires and interview guides, then analyzed using descriptive statistics. The findings revealed that viral load levels significantly influence maternal outcomes, with 54% of respondents agreeing that high viral load increases opportunistic infections and maternal mortality, 62% agreeing that suppressed viral load reduces pregnancy-related complications, and 61% indicating that high viral load weakens response to obstetric emergencies. Regarding access to ART, 56% of respondents agreed that ART improves maternal immune function and reduces complications, 80% confirmed that it lowers mother-to-child transmission, and 57% indicated that consistent ART use improves survival, although only 20% acknowledged the benefits of early initiation of therapy. On HIV infection status, only 29% agreed that HIV-positive women have a higher risk of maternal mortality, while 60% disagreed, indicating gaps in awareness despite evidence of indirect effects such as weakened immunity and increased complications. The study generally concludes that HIV infection significantly contributes to maternal mortality through high viral load, limited access to ART, and weakened immunity, despite existing interventions. The study recommends that the government should strengthen integrated maternal and HIV healthcare services by improving access to ART, enhancing viral load monitoring, and increasing awareness programs to promote early treatment and adherence in order to reduce maternal mortality among HIV-positive pregnant women.

CHAPTER ONE: INTRODUCTION

1.0 Introduction

The study sought to examine the effect of HIV infection on maternal mortality among pregnant women at Mukono general hospital, Mukono church of Uganda hospital, Mukono district. HIV infections refers to the presence and replication of the human immunodeficiency virus in an individual, which weakens the immune system and increases susceptibility to opportunistic infections (Patel et al., 2023). Maternal health outcomes among pregnant mothers refers to the physical, psychological, and social well-being of women during pregnancy, childbirth, and the postpartum period, including the risks of complications and mortality (Okello et al., 2024). This chapter presents a background of the study, statement of the problem, general objectives, specific objectives, and research questions, scope of the study, justification of the study, significance of the study, conceptual framework and definition of key terms.

1.1 Background of the study

Globally, HIV infection continues to exert a significant influence on maternal health outcomes despite substantial expansion of antiretroviral therapy (ART) and prevention of mother-to-child transmission (PMTCT) programs. UNAIDS (2024) estimates that about 1.3 million women living with HIV become pregnant each year, with HIV contributing to approximately 10% of maternal deaths worldwide. Evidence shows that HIV-positive pregnant women face higher risks of anemia, opportunistic infections, hypertensive disorders, postpartum hemorrhage, and sepsis than HIV-negative women (World Health Organization [WHO], 2023; Calvert & Ronsmans, 2021). Kourtis and Jamieson (2020) further demonstrate that immunosuppression and ART-related metabolic effects increase vulnerability to pregnancy complications. Although ART has reduced HIV-related maternal mortality by over 50% since 2010, maternal morbidity remains disproportionately high among HIV-infected women (UNAIDS, 2024; WHO, 2023). Existing global studies largely emphasize infant transmission outcomes, leaving a gap in detailed analysis of maternal morbidity patterns attributable to HIV during pregnancy.

In North America, HIV prevalence among pregnant women is relatively low, estimated at 0.3–0.5%, yet HIV-related maternal complications persist, particularly among socio-economically marginalized populations (Centers for Disease Control and Prevention [CDC], 2023; Haddad et al., 2021). Studies report increased risks of preterm delivery, cesarean section, pregnancy-

induced hypertension, and postpartum infections among HIV-positive mothers compared to HIV-negative counterparts (Aebi-Popp & Mulcahy, 2020; Momplaisir & Storm, 2022). Despite ART coverage exceeding 90%, disparities in access to antenatal care and stigma continue to delay early treatment initiation and adherence (Taylor et al., 2021; Kendall & Albert, 2023). While maternal survival has improved significantly, the literature prioritizes neonatal outcomes and viral suppression, with limited emphasis on maternal health sequelae such as anemia and obstetric complications, indicating a knowledge gap regarding long-term maternal health risks associated with HIV in high-income contexts.

In West Africa, HIV infection remains a critical determinant of adverse maternal health outcomes due to high disease burden and constrained health systems. Regional prevalence among women of reproductive age is estimated at 2.1%, with HIV accounting for nearly 12% of maternal deaths (UNAIDS, 2023; WHO, 2022). Studies in Nigeria and Ghana reveal that HIV-positive pregnant women experience higher rates of severe anemia, tuberculosis co-infection, obstetric hemorrhage, and puerperal sepsis (Adebayo & Oladimeji, 2021; Boateng et al., 2022). Although PMTCT services have expanded, only about 74% of HIV-positive pregnant women receive sustained ART throughout pregnancy (UNAIDS, 2023). Cultural barriers, poverty, and late antenatal attendance further compromise maternal health outcomes (Gyimah & Awuah, 2020; Boateng et al., 2022). Most studies in the region focus on infant HIV transmission rather than maternal morbidity and mortality, underscoring a gap in understanding the full maternal health impact of HIV infection during pregnancy.

In Uganda, HIV remains a significant contributor to maternal morbidity despite strong PMTCT policy frameworks. Uganda's HIV prevalence among women aged 15–49 is estimated at 6.2%, with approximately 90,000 HIV-positive pregnancies annually (Ministry of Health [MoH], 2023; UNAIDS, 2024). Research indicates that HIV-infected pregnant women are more likely to experience pregnancy-related anemia, opportunistic infections, preterm labor, and postpartum complications than HIV-negative women (Ssebunya & Musoke, 2021; Nakimuli et al., 2022). Although ART coverage among pregnant women exceeds 85%, delayed antenatal booking and treatment interruptions remain common (MoH, 2023; Kintu & Nanyonga, 2021). Furthermore, stigma and socio-economic constraints continue to limit effective utilization of maternal health services (Atuyambe & Mirembe, 2020; Nakimuli et al., 2022). National studies have largely

emphasized viral suppression and child outcomes, leaving maternal health outcomes under-explored, which constrains evidence-based maternal care planning.

At Mukono General Hospital in Mukono District, HIV infection among pregnant women remains a notable maternal health concern. District health records indicate that 7–9% of antenatal attendees tested HIV-positive between 2022 and 2024, and HIV-positive mothers reported higher incidences of moderate to severe anemia, obstetric infections, and prolonged labor compared to HIV-negative women (Mukono District Health Office, 2024; Health Management Information System [HMIS], 2024). Facility data further show that HIV-related complications contribute to increased antenatal admissions and longer postpartum hospital stays, exerting pressure on maternal health services (Mukono District Health Office, 2024; MoH, 2023). While PMTCT and ART services are available, inconsistent adherence, late antenatal care attendance, and stigma remain barriers to optimal maternal outcomes (Kasozi & Mugisha, 2022; Atwine & Luwaga, 2023). However, there is limited facility-specific empirical evidence linking HIV infection directly to maternal health outcomes such as hemorrhage, hypertensive disorders, and sepsis, creating a localized evidence gap.

The justification for this study is grounded in the persistent burden of HIV-related maternal morbidity and mortality despite global and national interventions. Existing literature prioritizes prevention of vertical transmission and viral suppression, often overlooking maternal health outcomes such as obstetric complications, infections, and postpartum recovery (WHO, 2023; UNAIDS, 2024). Moreover, most studies rely on national or regional datasets and inadequately capture facility-level dynamics, particularly in settings such as Mukono General Hospital where service delivery challenges differ from national averages (MoH, 2023; Mukono District Health Office, 2024). The absence of context-specific evidence limits the capacity of health planners and clinicians to design targeted maternal care strategies for HIV-positive pregnant women. By examining the relationship between HIV infection and maternal health outcomes at hospital level, this study seeks to fill a critical knowledge gap, strengthen scholarly understanding of HIV-related maternal morbidity, and inform culturally and contextually responsive maternal health interventions.

1.2 Problem statement

Globally, HIV infection remains a major public health challenge among women of reproductive age and continues to compromise maternal health outcomes despite advances in prevention and treatment. The World Health Organization reports that a substantial proportion of pregnant women living with HIV experience higher risks of obstetric complications such as anemia, opportunistic infections, preterm labor, and low birth weight compared to HIV-negative women. Although prevention of mother-to-child transmission (PMTCT) programs and antiretroviral therapy (ART) have significantly reduced HIV-related maternal and neonatal morbidity and mortality, disparities persist in low- and middle-income countries where health system constraints, late antenatal attendance, and stigma affect service utilization and continuity of care.

In Uganda, HIV remains a leading indirect cause of maternal morbidity and mortality, particularly among pregnant women who present late for antenatal care or have poor adherence to treatment. National health reports indicate that HIV-positive pregnant women are more vulnerable to pregnancy-related complications such as hemorrhage, sepsis, and poor nutritional status, which negatively influence pregnancy outcomes. In Mukono District, health facility records continue to show a notable burden of HIV among women attending antenatal clinics, with associated challenges including co-infections, delayed initiation of ART, and inconsistent follow-up. These factors increase the likelihood of adverse maternal health outcomes such as prolonged labor, increased need for medical interventions, and higher rates of postnatal complications.

At Mukono General Hospital, Mukono church of Uganda hospital, pregnant women living with HIV continue to experience preventable maternal health problems despite the presence of PMTCT services, routine HIV testing, and availability of ART. Reports from the hospital indicate recurring cases of pregnancy-related complications among HIV-positive mothers, suggesting gaps in early detection, treatment adherence, and comprehensive maternal care. While several interventions have been implemented to address HIV in pregnancy, adverse maternal health outcomes associated with HIV infection persist. This situation highlights a critical need to systematically examine how HIV infection affects maternal health outcomes among pregnant women in Mukono District in order to generate evidence that can guide more effective and targeted maternal health interventions.

1.3 Purpose of the study

To analyze the effect of HIV infection on maternal mortality among pregnant women at Mukono general hospital, Mukono church of Uganda hospital, Mukono district

1.4 Specific objectives

- i. To find out the effect of viral load levels on maternal mortality among HIV positive pregnant women in Mukono general hospital, Mukono church of Uganda hospital
- ii. To examine the influence of access to antiretroviral therapy (ART) on maternal and infant health outcomes among HIV positive pregnant women in Mukono general hospital, Mukono church of Uganda hospital
- iii. To assess the effect of HIV infection status on maternal mortality among pregnant women in Mukono general hospital, Mukono church of Uganda hospital

1.5 Research questions

- i. What is the effect of viral load levels on maternal mortality among HIV positive pregnant women in Mukono general hospital, Mukono church of Uganda hospital?
- ii. What is the influence of access to antiretroviral therapy (ART) on maternal and infant health outcomes among HIV positive pregnant women in Mukono general hospital, Mukono church of Uganda hospital?
- iii. What is the effect of HIV infection status on maternal mortality among pregnant women in Mukono general hospital, Mukono church of Uganda hospital?

1.6 Scope of the study

1.6.1 Geographical location

This study was carried out from Mukono General Hospital, Mukono church of Uganda hospital which is located in Mukono town, within Mukono District in the central region of the country, serving both urban and surrounding rural communities. The hospital is strategically positioned along major transport routes, making it accessible to a large catchment population with diverse health needs. It experiences high patient volumes, including women of reproductive age, which provides a suitable setting for studying maternal health patterns and outcomes. The facility has a mix of experienced staff and specialized units that manage complex pregnancies, allowing observation of variations in care and service delivery.

1.6.2 Time scope

The period to be considered for the study was 3 years that is from 2021-2024, this is because during that period at Mukono General Hospital, Mukono church of Uganda hospital, pregnant women living with HIV continue to experience preventable maternal health problems despite the presence of PMTCT services, routine HIV testing, and availability of ART.

1.6.3 Content scope

The study was limited to the effect of HIV infection on maternal health outcomes among pregnant women at Mukono general hospital, Mukono church of Uganda hospital.

1.7 Significance the study

Hospital administrators at Mukono General Hospital, Mukono church of Uganda hospital may find the study important as it may provide evidence on factors influencing maternal health outcomes. The findings may guide improvements in service delivery, planning, and allocation of resources to strengthen maternal care systems.

Health workers including doctors, midwives, and nurses may benefit from the study because it may enhance their understanding of clinical and social challenges faced by expectant mothers. The results may support better management practices and improve the quality of care provided to vulnerable mothers.

Pregnant mothers and their families may gain from the study as it may increase awareness of health risks and the importance of timely medical support. The findings may promote informed decision-making and encourage adherence to recommended maternal health services.

District health officials and policymakers may use the study to inform the design of maternal health programs and policies. The evidence generated may support strategies aimed at reducing complications and improving overall maternal health outcomes.

Researchers and academicians may benefit from the study as it may contribute to knowledge on maternal health and health system responses. The findings may serve as a reference for future studies and may guide the development of effective interventions in similar healthcare settings.

1.8 justification of the study

The study may address the ongoing concern that maternal infections continue to complicate pregnancies and contribute to poor health outcomes for mothers and infants in many healthcare settings. Recent evidence shows that infections during pregnancy increase risks such as preterm birth and maternal morbidity, especially when compounded by limited access to comprehensive maternal care (Atowoju et al., 2024; CDC, 2024). Understanding these influences may support improvements in maternal health services.

It may also explore how co-existing infections can weaken women's immune responses during pregnancy, which may elevate the likelihood of complications such as prolonged labour or low birth weight infants. Literature indicates that women with underlying infections often experience greater clinical challenges that require enhanced monitoring (Serunjogi et al., 2025; Atowoju et al., 2024). Insights from this study may help inform clinical support strategies.

The study may consider gaps in healthcare delivery that may affect women's continuity of care. In many district hospitals, inconsistent screening, counselling, and follow-up services are cited as barriers to effective maternal care (CDC, 2024; Serunjogi et al., 2025). By focusing on these issues, the study may highlight areas where services may be strengthened to improve outcomes.

It may also examine socio-economic and behavioral factors that may limit women's ability to adhere to antenatal care recommendations, such as transport costs, stigma, or limited awareness of treatment options. Studies show that these barriers can negatively affect maternal health outcomes (Atowoju et al., 2024; CDC, 2024). Generating evidence on these influences may support tailored community interventions.

The study may provide localized evidence that may assist health planners and policymakers to make informed decisions on resource allocation and health planning at the facility and district level. National statistics often overlook facility-specific dynamics that shape maternal health experiences (Serunjogi et al., 2025; CDC, 2024). Such evidence was crucial for improving maternal service delivery.

1.9 Conceptual frame work

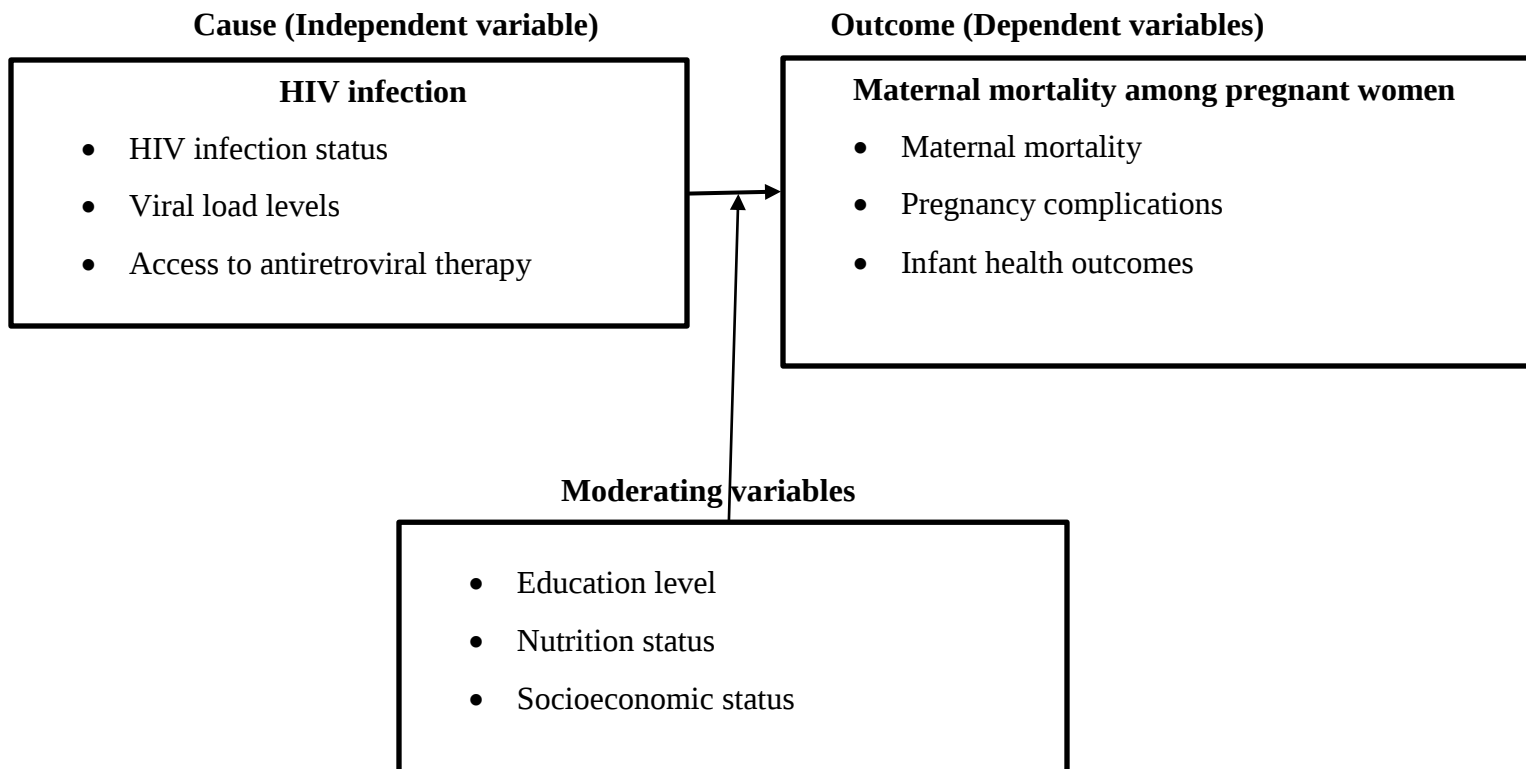


Figure 1:1: conceptual framework

Source: Adopted from Mugenda and Mugenda (2004): conceptual framework

Figure 1:1 above shows that HIV infection is the primary independent variable affecting maternal mortality among pregnant women, as being HIV-positive directly increases the risk of health complications during pregnancy. Viral load levels serve as another independent factor, where higher concentrations of the virus in the blood can worsen maternal immunity, leading to greater chances of opportunistic infections, anaemia, and other pregnancy complications. Access to antiretroviral therapy (ART) is also crucial, as timely and consistent treatment can suppress the virus, improve the mother's health, and reduce the risk of transmitting HIV to the infant. These independent variables influence the dependent variables, which include maternal mortality and morbidity, representing deaths or severe health issues during pregnancy; pregnancy complications, such as preterm labour, low birth weight, and infections; and infant health outcomes, including the risk of vertical HIV transmission and poor neonatal health. The framework also incorporates moderating variables that affect the strength of these relationships: nutritional status, where proper nutrition enhances immunity and reduces complications; education level, which enables women to understand and adhere to treatment and preventive

measures; and socioeconomic status, which determines access to healthcare services, proper nutrition, and overall support during pregnancy.

1.10 Definition of key terms

HIV infections refers to the condition in which an individual is infected with the human immunodeficiency virus, leading to a weakened immune system and increased vulnerability to opportunistic infections (Patel et al., 2023). For example, individuals with HIV may experience frequent infections or fatigue due to immune suppression. Early diagnosis and antiretroviral therapy help control the virus and reduce transmission risks. HIV infections remain a major public health concern affecting both individuals and communities.

Maternal health outcomes among pregnant mothers refers to the physical, mental, and social well-being of women during pregnancy, childbirth, and the postpartum period, including risks of complications, morbidity, and mortality (Okello et al., 2024). For instance, women living with HIV may face higher chances of anemia, preterm labor, or delivering low birth weight babies. Quality antenatal care, nutrition, and preventive interventions improve maternal health outcomes. Positive outcomes depend on both medical support and social care.

Pregnant women refer to female individuals carrying a developing fetus, who experience physiological and psychological changes requiring specialized healthcare (Adebayo et al., 2023). For example, regular antenatal visits help monitor fetal development and prevent complications such as preeclampsia. Pregnant women's health is influenced by nutrition, lifestyle, and access to medical services. Ensuring their well-being is critical for both maternal and infant health outcomes.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter reviews literature related to the key concepts of the study as presented by different scholars. It also includes theoretical framework relevant to the research problem in order to establish the existing knowledge and identify the research gaps.

2.1 Theoretical review

The Health Belief Model (Rosenstock, 1966) and the Social Determinants of Health Theory (Marmot, 2005) both explain factors influencing health outcomes but from different perspectives. The Health Belief Model focuses on individual perceptions of risk, severity, benefits, and barriers, offering a clear framework for understanding why individuals adopt protective behaviors. Its strength lies in explaining personal decision-making and behavior change, while its limitation is the narrow focus on individual cognition, often overlooking broader social and structural influences. In contrast, the Social Determinants of Health Theory emphasizes the role of social, economic, and environmental conditions, capturing how inequities in income, education, and healthcare access shape health outcomes. Its strength is the comprehensive view of systemic factors, but it does not explicitly explain individual behavioral choices.

The chosen theoretical framework integrates both models, combining the behavioral focus of the Health Belief Model with the structural perspective of Social Determinants of Health. This integration is justified because it provides a holistic understanding of how personal perceptions and external conditions interact to influence health outcomes. Scholar reviews, such as Becker (1974) on HBM and Solar and Irwin (2010) on social determinants, support this combined approach, emphasizing that both individual beliefs and systemic inequalities must be considered to fully explain variations in health experiences. This framework best suits the study as it captures the multidimensional factors influencing health trajectories, connecting behavioral decisions with structural contexts for a comprehensive analysis.

2.2 The effect of viral load levels on maternal mortality among HIV positive pregnant women

Fisher and Tsegaye (2021) contends that maternal viral load level is a critical determinant of health outcomes among HIV-positive pregnant women, influencing both maternal morbidity and vertical transmission risks. The study found that women who maintain suppressed viral loads throughout pregnancy experience significantly lower rates of obstetric complications, including preterm birth, low birth weight, and perinatal HIV transmission, compared with those with high or unsuppressed viral loads. Their systematic review highlighted that effective antiretroviral therapy (ART) initiated early and maintained with high adherence is associated with improved maternal immune function, reduced opportunistic infections, and better overall pregnancy outcomes (Smith et al. 2022).

Nguyen and Martinez (2023) opined that maternal viral load levels are closely correlated with immune activation and systemic inflammation, which in turn affect maternal health outcomes across pregnancy and the postpartum period. The study found that pregnant women with high viral loads exhibit elevated inflammatory markers, greater incidence of maternal anemia, and increased risk of co-infections such as tuberculosis and bacterial sepsis, leading to poorer health outcomes. Patel et al. (2024) reported that women with suppressed viral loads had significantly higher CD4 counts, better weight gain trajectories during pregnancy, and lower rates of obstetric complications compared with women with detectable viral loads. Their multicounty analysis demonstrated that sustained viral suppression was associated with enhanced maternal wellbeing and reduced need for emergency interventions during labor and delivery.

Oliveira and Chen (2025) stressed that viral load monitoring and targeted interventions can markedly improve maternal health outcomes among HIV-positive pregnant women by enabling timely ART optimization and adherence support. Oliveira and Chen found that programs integrating routine viral load testing with tailored adherence counseling and psychosocial support significantly increased rates of viral suppression, reduced maternal mortality, and improved pregnancy outcomes in diverse settings. Gomez and Hussein (2025) reported that women who achieved sustained viral suppression had lower incidences of pregnancy-related hypertensive disorders, reduced risk of maternal anemia, and shorter hospital stays postpartum compared with those with persistent high viral loads.

Moyo and Nkosi (2021) insinuated that maternal viral load levels are strongly associated with both maternal and neonatal health outcomes among HIV-positive pregnant women. Their study in southern and eastern Africa found that women with suppressed viral loads throughout pregnancy had significantly lower risk of adverse outcomes such as preterm birth, low birth weight, and maternal opportunistic infections compared with women with detectable viral loads. In Africa, where the burden of HIV in pregnancy remains high, achieving viral suppression through consistent antiretroviral therapy (ART) was shown to reduce the incidence of maternal anemia, postpartum infections, and pregnancy-related morbidity. Adeyemi et al. (2022) reported that high maternal viral load was also linked with increased risk of vertical transmission, which in turn affected maternal psychological wellbeing and increased the likelihood of postpartum depression.

Kamau and Otieno (2023) denoted that maternal viral load levels influence immune function and susceptibility to co-infections, which in turn affect maternal health outcomes in various African populations. Their longitudinal study across East and Central African clinics found that women with persistently elevated viral loads had significantly higher rates of tuberculosis, bacterial sepsis, and maternal mortality compared with women who achieved viral suppression. Dube and Chikuse (2024) reported that viral suppression achieved through early initiation of ART and enhanced clinical support was associated with improved CD4 counts, fewer maternal complications, and lower rates of hospitalization during pregnancy. Their multi-site analysis showed that consistent viral load monitoring and interventions tailored to maternal needs resulted in better maternal health outcomes, emphasizing that effective management of viral load is critical to reducing maternal morbidity and mortality across African settings.

Okechukwu and Manyisa (2024) stressed that interventions aimed at improving viral load suppression in pregnant women have shown promising effects on maternal health outcomes in African programs that integrate clinical, community, and psychosocial components. Their research found that pregnant women enrolled in comprehensive care models combining routine viral load testing, ART adherence support, and community health outreach had higher rates of sustained viral suppression and improved pregnancy outcomes than those receiving standard care. In Africa, such integrated approaches were linked with reduced maternal anemia, lower

rates of obstetric complications, and enhanced retention in care postpartum (Ndlovu and Tshuma 2025).

Kirungi and Nalwoga (2021) postulated that maternal viral load level is one of the most important predictors of maternal health outcomes among HIV-positive pregnant women, with implications for both maternal morbidity and vertical transmission. The study further observed that women with high viral loads had higher rates of hospital admissions due to HIV-related complications, underscoring the importance of viral suppression for maternal health. Tumwesigye et al. (2022) reported that elevated viral load levels were associated with increased incidence of postpartum infections and delayed immune recovery, with severely elevated viral loads linked to poorer overall health outcomes postpartum. Their findings highlight that maintaining low viral load levels through effective antiretroviral therapy (ART) is crucial in reducing adverse health outcomes for HIV-positive pregnant women in Uganda.

Namutebi and Oketch (2023) opined that viral load levels also influence immune function and susceptibility to co-infections among HIV-positive pregnant women in Uganda, which has significant effects on maternal health outcomes. The study found that women with higher viral loads were more likely to experience tuberculosis co-infection, bacterial sepsis, and severe anemia during pregnancy compared with women who achieved sustained viral suppression. Byenkya et al. (2024) observed that sustained viral suppression was correlated with improved CD4 counts, reduced immune activation, and fewer incidences of opportunistic infections, contributing to better maternal well-being and lower morbidity during pregnancy. Their research emphasized that early initiation of ART and close monitoring of viral load can significantly mitigate co-infection and immune suppression, improving overall pregnancy outcomes for HIV-positive women in Uganda.

Achieng and Ssempebwa (2024) affirmed that interventions aimed at reducing maternal viral load through enhanced ART adherence support have been shown to improve maternal health outcomes in Uganda. They found that women enrolled in these comprehensive care models were more likely to achieve and maintain viral suppression, which in turn was associated with reduced pregnancy-related complications, lower incidence of hypertensive disorders, and improved postpartum recovery. Kato et al. (2025) found that women with sustained viral suppression experienced higher quality of life and fewer hospital readmissions after delivery compared with

women with persistent high viral loads. Their study also documented that tailored support strategies, including peer support and appointment reminders, significantly increased retention in care.

Namusoke and Kato (2021) contends that maternal viral load levels are a key determinant of health outcomes among HIV-positive pregnant women receiving care at Ugandan health facilities, including Mukono General Hospital. Their cross-sectional study involving antenatal clinic attendees found that women who maintained suppressed viral loads (<50 copies/mL) throughout pregnancy experienced significantly lower rates of obstetric complications, such as preeclampsia, severe anemia, and preterm labor, compared with women with high or unsuppressed viral loads. Lumu et al. (2022) reported that unsuppressed viral load at 36 weeks gestation was associated with increased maternal hospital admissions due to opportunistic infections and HIV-related morbidities. They found that women with persistent viremia were more likely to develop postpartum infections and require extended clinical support, underscoring the importance of sustained viral suppression for maternal wellbeing at Mukono General Hospital and similar Ugandan settings.

According to Achieng and Namirembe (2023), interventions aimed at improving viral load suppression among pregnant women at Mukono General Hospital have been linked with enhanced maternal health outcomes when combined with structured adherence support and community follow-up. Their program evaluation found that integrating routine viral load testing with enhanced counselling, peer support groups, and community health outreach significantly increased the proportion of women achieving sustained viral suppression throughout pregnancy.

Research gap

The literature reviewed indicates that considerable efforts have been made globally, regionally, and within Uganda to understand the relationship between HIV infection and maternal health outcomes among pregnant women. Most existing studies have focused on broad outcomes such as prevention of mother-to-child transmission (PMTCT), viral suppression, and infant health outcomes. While these studies provide valuable insights, they largely rely on national or regional datasets and emphasize generalized findings, which may not accurately reflect the specific realities at individual health facilities such as Mukono General Hospital and Mukono Church of Uganda Hospital.

2.3 The influence of access to antiretroviral therapy (ART) on maternal and infant health outcomes among HIV positive pregnant women

Fisher and Adeyemi (2021) demonstrates that access to antiretroviral therapy (ART) significantly improves both maternal and infant health outcomes among HIV-positive pregnant women, with enhanced ART coverage linked to reduced maternal morbidity and vertical transmission. The study found that women who initiated ART early in pregnancy and maintained high adherence had significantly lower rates of obstetric complications, such as preterm birth and maternal morbidity, compared with women with limited or delayed access. Chibanda et al. (2022) reported that robust ART access is associated with lowered rates of infant HIV infection and enhanced infant survival, as maternal viral suppression during pregnancy reduces perinatal transmission.

Nguyen and Patel (2022) opined that consistent access to ART before, during, and after pregnancy is a key driver of positive health outcomes for both mothers and infants, particularly in resource-limited settings where HIV prevalence remains high. The study found that among HIV-positive pregnant women with continuous ART access, the incidence of HIV-related opportunistic infections, maternal anemia, and HIV-related mortality decreased substantially, demonstrating the protective effect of treatment continuity. Mburu et al. (2023) investigated ART adherence support interventions and reported that women with sustained ART access experienced better immunologic recovery, higher CD4 counts, and improved postpartum health, while their infants showed enhanced growth and reduced hospitalizations for HIV-related illnesses.

Oliveira and Luchters (2024) stressed that expanded and equitable access to ART services during pregnancy leads to improved long-term health for mothers and infants by reducing the burden of HIV disease and associated complications. They found that programs integrating routine antenatal ART provision with community outreach, viral load monitoring, and maternal counselling were effective in reducing maternal mortality and improving infant HIV-free survival up to 24 months postpartum. Gomez and Hussein (2025) reported that ART access contributes to decreased rates of pregnancy-related hypertension and gestational complications among HIV-positive women, with corresponding improvements in infant immunologic outcomes and reduced early childhood morbidity.

Moyo and Nkosi (2021) affirmed that access to antiretroviral therapy (ART) in Africa significantly improves maternal and infant health outcomes among HIV-positive pregnant women by reducing maternal HIV-related morbidity and preventing mother-to-child transmission. Their multisite study across eastern and southern Africa found that women with uninterrupted access to ART before and during pregnancy had significantly lower rates of obstetric complications such as preterm birth, low birth weight, and maternal anemia compared with women with delayed or inconsistent access. Adeyemi et al. (2022) reported that in contexts where ART scale-up programs had been implemented, HIV-exposed infants born to mothers with sustained ART access experienced higher immunologic resilience and significantly lower HIV infection rates at birth compared with infants born to mothers with limited ART access.

Kamau and Otieno (2023) contends that ART access in Africa also plays a critical role in mitigating the risk of co-infections and improving overall maternal health outcomes among HIV-positive pregnant women, especially in regions with high burdens of endemic diseases. Their longitudinal cohort study in East and Central Africa found that women who maintained ART throughout pregnancy exhibited fewer opportunistic infections, such as tuberculosis and bacterial sepsis, which are significant contributors to maternal mortality in Africa. This improved health trajectory was attributed to ART-mediated immune restoration and better viral suppression. Dube and Chikuse (2024) reported that among African women with consistent ART access, improved CD4 counts and immune parameters were linked to lower incidences of severe anemia and reduction in maternal hospitalizations during pregnancy and postpartum. Their findings emphasize that ART's beneficial effects on immune function translate directly into enhanced maternal health outcomes and lower complication rates for both mothers and their infants in African healthcare settings.

Okechukwu and Manyisa (2024) alluded that integrated ART access programs that combine routine maternal ART provision with adherence counselling, viral load monitoring, and community support are associated with substantial improvements in both maternal and infant health outcomes in Africa. Their research demonstrated that pregnant women enrolled in comprehensive care models were more likely to sustain viral suppression, leading to fewer maternal complications, lower rates of pregnancy-related hypertension, and enhanced maternal quality of life postpartum (Ndlovu and Tshuma 2025).

Kirungi and Nalwoga (2021) postulated that access to antiretroviral therapy (ART) in Uganda is critically linked to improved maternal and infant health outcomes among HIV-positive pregnant women. The study further showed that ART access was associated with enhanced maternal immune parameters and reduced HIV viral load levels, which are key determinants of both maternal wellbeing and perinatal outcomes. Tumwesigye et al. (2022) reported that infants born to mothers with uninterrupted ART access had higher birth weights and significantly lower rates of mother-to-child HIV transmission than infants of mothers with inconsistent ART coverage. Their findings underscore that in Uganda, consistent ART access not only protects maternal health but also contributes to improved neonatal outcomes, highlighting the importance of early initiation and sustained ART throughout pregnancy.

Namutebi and Oketch (2023) insinuated that maternal access to ART is also associated with reduced incidence of co-infections and better postpartum immune function, which influence overall health outcomes for HIV-positive pregnant women in Uganda. In a longitudinal study across western and northern regions, they found that women who maintained consistent ART regimens during pregnancy had significantly lower rates of tuberculosis and bacterial sepsis compared with women with interrupted or no ART access. This improved health profile was correlated with better CD4 counts at delivery and lower maternal morbidity in the postpartum period. Byenkya et al. (2024) demonstrated that ART access, when combined with routine viral load monitoring and integrated clinical support, resulted in fewer hospital admissions due to HIV-related complications and higher rates of maternal survival up to six months postpartum.

Achieng and Ssempebwa (2024) affirmed that holistic ART delivery models that combine treatment access with adherence support, nutritional counselling, and community health outreach have further strengthened maternal and infant health outcomes among HIV-positive pregnant women in Uganda. Their evaluation of clinic-based programs in central Uganda showed that women receiving comprehensive care with integrated ART adherence interventions and peer support were more likely to achieve viral suppression during pregnancy and maintain better overall health at delivery. Kato et al. (2025) found that sustained ART access in such programs was linked with lower incidence of pregnancy-related hypertensive disorders, reduced maternal anemia, and improved postpartum recovery. Additionally, infants born to women in integrated ART care exhibited higher HIV-free survival rates and lower incidences of neonatal morbidity.

Namusoke and Kato (2021) demonstrated that women who initiated ART early in pregnancy and adhered consistently experienced lower levels of viral load and fewer pregnancy-related complications, including anemia and opportunistic infections. Access to antiretroviral therapy (ART) has been shown to significantly improve maternal health outcomes among HIV-positive pregnant women receiving care at Ugandan health facilities such as Mukono General Hospital. Their study found that regular ART use strengthened immune function and reduced HIV-related morbidity during pregnancy. Lumu et al. (2022) further established that uninterrupted ART access was associated with reduced hospitalization rates and improved obstetric stability among HIV-positive mothers. Their findings indicated that women with sustained ART access were more likely to complete antenatal visits and deliver under skilled care, suggesting that ART availability positively shapes maternal survival and pregnancy outcomes.

Tumwesigye and Okello (2022) found that infants born to mothers who maintained ART throughout pregnancy had significantly lower rates of HIV transmission and higher birth weights compared to infants whose mothers had delayed or inconsistent ART use. Their study reported that maternal viral suppression achieved through ART played a central role in reducing perinatal infection risk. Moreover, Akumu et al. (2023) revealed that infants whose mothers adhered to ART experienced fewer neonatal infections and improved early growth patterns. These results demonstrate that ART access not only protects maternal health but also strengthens infant survival and development by reducing exposure to HIV and related complications during pregnancy and delivery.

Research gap

Although previous research has examined factors such as viral load levels and access to antiretroviral therapy (ART), there is limited empirical evidence that clearly links these factors to maternal mortality outcomes at the facility level. Many studies emphasize maternal morbidity indicators like anemia, opportunistic infections, and preterm birth, but do not sufficiently explore how these translate into maternal mortality within specific hospital settings. In addition, existing literature often treats these variables independently, with limited integration of how HIV infection status, viral load levels, and ART access collectively influence maternal mortality among pregnant women.

2.4 The effect of HIV infection status on maternal mortality among pregnant women

According to Cresswell et al. (2025), HIV infection remains a significant indirect contributor to maternal mortality despite global declines in overall maternal deaths, with persistent disparities observed globally across regions with varying healthcare access. Their study found that although maternal mortality ratios have reduced over time, indirect causes such as HIV continue to account for a notable proportion of deaths, particularly in low-resource settings where access to timely treatment remains limited. Duri et al. (2025) reported that inequalities in healthcare systems significantly influence maternal outcomes, noting that women in resource-limited settings experience disproportionately higher mortality risks compared to those in high-income regions, partly due to the compounded effects of HIV and limited access to quality maternal care.

Siregar et al. (2021) opined that HIV infection status directly affects pregnancy outcomes and contributes to increased maternal mortality through complications such as opportunistic infections, anemia, and poor treatment adherence globally. Their study found that limited access to HIV testing and treatment services among pregnant women increases the likelihood of adverse outcomes, including mortality, especially in settings where prevention of mother-to-child transmission programs are weak. Fleşeriu et al. (2025) observed that HIV infection is associated with adverse pregnancy outcomes including stillbirths, intrauterine growth restriction, and perinatal mortality, all of which indirectly contribute to maternal health deterioration and increased risk of death. Their findings emphasized that comprehensive maternal health interventions must integrate HIV care to reduce preventable mortality among affected women

Lathrop et al. (2020) alluded that women living with HIV have significantly higher mortality risks during pregnancy and the postpartum period compared to HIV-negative women, with estimates suggesting a two to ten times greater likelihood of death globally. Their study found that HIV-related causes account for a substantial proportion of maternal deaths, particularly in regions with high HIV prevalence, and that the burden remains unevenly distributed despite global progress in reducing maternal mortality. Calvert et al. (2020) reported that HIV contributes to both direct and indirect maternal deaths, with variations in estimates depending on classification methods, but consistently highlighting its role as a major risk factor in pregnancy-related mortality. Their study emphasized that integrating HIV services into maternal healthcare

systems is essential for reducing mortality and improving survival outcomes among pregnant women

Knight et al. (2022) contends that HIV infection continues to contribute to maternal mortality as an indirect cause even within well-resourced health systems in Britain, particularly among women who present late for antenatal care or have complex social vulnerabilities. Their report found that although overall maternal mortality remains low, HIV-positive women are still at increased risk of severe complications due to immune suppression and co-existing conditions such as infections and anemia. The findings further indicated that delays in accessing maternity services, especially among migrant populations, significantly increase the likelihood of adverse outcomes. Effective early screening and continuous clinical monitoring were identified as critical in reducing these risks. Nair et al. (2024) observed that inequalities in healthcare access, including socioeconomic disadvantages and limited engagement with health services, continue to shape maternal outcomes among women living with HIV, emphasizing the need for targeted interventions.

Taylor et al. (2020) noted that access to and adherence to antiretroviral therapy has greatly improved maternal survival outcomes among women living with HIV in Britain, although gaps in consistent treatment utilization remain a challenge. Their study found that women who initiate treatment early in pregnancy and maintain adherence experience significantly reduced risks of complications and mortality. However, the research also highlighted that psychosocial factors such as stigma, fear of disclosure, and limited social support can hinder full engagement with healthcare services. These barriers may result in missed appointments and delayed treatment, which negatively affect maternal health. Peters et al. (2023) reported that women facing economic hardship or unstable living conditions are more likely to experience difficulties in accessing consistent care, which increases their vulnerability to adverse maternal outcomes despite the availability of advanced healthcare systems.

Calvert et al. (2021) stressed that HIV contributes to maternal mortality primarily through indirect pathways, including opportunistic infections and complications associated with weakened immunity in Britain, even though the burden is lower compared to high-prevalence regions. Their study found that HIV-positive women are more likely to experience severe maternal morbidity, which can escalate into mortality if not effectively managed. Fleming et al.

(2021) identified that strengthening culturally responsive healthcare services and improving continuity of care can significantly reduce HIV-related maternal mortality, ensuring equitable health outcomes across diverse populations.

Calvert and Ronsmans (2021) postulated that HIV infection continues to play a significant indirect role in maternal mortality across many parts of Africa, where the prevalence of the disease remains high among women of reproductive age. Their study found that HIV-positive pregnant women are more vulnerable to complications such as opportunistic infections, severe anemia, and weakened immunity, all of which increase the likelihood of death during pregnancy and the postpartum period. The findings indicated that although antiretroviral therapy has improved survival outcomes, gaps in early diagnosis and consistent treatment still contribute to preventable deaths. Limited access to quality maternal healthcare services in many African settings further worsens these outcomes. Kassebaum and colleagues (2020) observed that HIV contributes substantially to maternal mortality in sub-Saharan regions, especially where healthcare systems are weak and access to timely medical intervention is limited, emphasizing the continued burden of HIV-related complications on maternal health.

Say and colleagues (2020) alluded that indirect causes such as HIV infection remain important contributors to maternal mortality in Africa, despite global efforts to reduce deaths associated with pregnancy and childbirth. Their study found that HIV-related complications often interact with other conditions such as tuberculosis and malaria, increasing the risk of death among pregnant women. The research also revealed that delayed access to antenatal care and insufficient integration of HIV services into maternal health systems are key factors contributing to poor outcomes. Zaba and collaborators (2021) reported that improving access to integrated healthcare services and ensuring early initiation of treatment can significantly reduce maternal deaths among HIV-positive women by enhancing disease management during pregnancy.

Chou and collaborators (2020) asserted that HIV remains a major indirect cause of maternal mortality, particularly in Africa, where socioeconomic inequalities significantly influence health outcomes. Their findings indicated that women living with HIV are more likely to experience adverse pregnancy outcomes due to factors such as poverty, limited education, and reduced access to healthcare services. These conditions often delay diagnosis and treatment, increasing the likelihood of complications and death. Tessema and colleagues (2021) found that strengthening health systems, expanding access to antiretroviral therapy, and improving maternal

healthcare services are essential strategies for reducing HIV-related maternal mortality and enhancing overall maternal health outcomes across the region.

Atuhaire and Ssewanyana (2020) affirmed that HIV infection continues to significantly influence maternal mortality in Uganda, particularly due to challenges related to late diagnosis and inconsistent access to antiretroviral therapy. Their study found that pregnant women living with HIV are more susceptible to complications such as opportunistic infections, anemia, and weakened immunity, which increase the likelihood of maternal death if not effectively managed. The findings further indicated that although HIV services have been integrated into maternal healthcare systems, gaps still exist in ensuring early and continuous treatment for all women. Limited access to quality healthcare in rural areas also contributes to delayed care-seeking behavior. Kigozi and colleagues (2021) reported that HIV-positive women who initiate treatment early and consistently attend antenatal care services have better maternal outcomes, highlighting the importance of strengthening healthcare delivery systems.

Namale and Mugisha (2022) denoted that maternal mortality among women living with HIV in Uganda is strongly influenced by health system challenges such as inadequate staffing, limited medical supplies, and long distances to healthcare facilities. Their study found that these barriers often delay access to essential maternal and HIV-related services, increasing the risk of complications during pregnancy and childbirth. The research also revealed that co-infections such as tuberculosis and malaria significantly worsen health outcomes for HIV-positive pregnant women. Okello and Byamugisha (2023) observed that integrating HIV care with maternal health services improves early detection, enhances adherence to treatment, and reduces maternal mortality by ensuring that women receive comprehensive and continuous care.

Research gap

Current studies do not adequately capture contextual and facility-specific factors such as quality of care, adherence challenges, timing of ART initiation, and health system constraints that may influence maternal outcomes in Mukono District. There is also a gap in understanding how socio-economic and behavioral factors interact with clinical conditions to affect maternal survival among HIV-positive pregnant women. Therefore, this study seeks to bridge these gaps by providing localized, empirical evidence on the effect of HIV infection on maternal mortality, with particular focus on viral load levels and access to ART among pregnant women at Mukono General Hospital and Mukono Church of Uganda Hospital.

CHAPTER THREE: METHODOLOGY

3.0 Introduction

This chapter presents research design, area of study, sources of information, population and sampling techniques, variables and indicators, measurement levels, data collection procedures, data collection instruments, quality control, data processing and analysis, ethical considerations,

3.1 Research design

The study used a descriptive research design utilizing both qualitative and quantitative approaches to gain a comprehensive understanding of the subject. A cross sectional survey was conducted to collect data from a diverse sample of respondents ensuring representation from key stakeholders. Structured questionnaires and in-depth interviews was used to gather primary data while secondary data was obtained from relevant reports and publications. The design facilitated an analysis of trends, challenges and perceptions allowing for a detailed examination of influencing the phenomenon under investigation.

3.2 Area of study

The research study was carried out from Mukono General Hospital, Mukono church of Uganda hospital which is located in Mukono town, within Mukono District in the central region of the country, serving both urban and surrounding rural communities. The hospital is strategically positioned along major transport routes, making it accessible to a large catchment population with diverse health needs. It experiences high patient volumes, including women of reproductive age, which provides a suitable setting for studying maternal health patterns and outcomes. The facility has a mix of experienced staff and specialized units that manage complex pregnancies, allowing observation of variations in care and service delivery.

3.3 Study population

The study used a study population of 75 individuals drawn from seven clearly defined target groups: 7 pregnant women attending the hospital who are the primary beneficiaries of maternal health services; 2 postpartum mothers who have recently delivered and can provide retrospective insights; 2 midwives and nurses providing antenatal, delivery, and postnatal care; 1 obstetric doctors or clinical officers who manage complex maternal cases; 4 hospital laboratory personnel involved in testing and monitoring maternal health indicators; 6 hospital administrators / records

officers who manage patient files and service delivery data; and 3 community health workers / outreach coordinators who support maternal follow-up and community education. Each subgroup is described by role and function (service users, clinical staff, technical support, management, and outreach), and together they total 25.

3.4 Sources of information

The information for the study was got from primary and secondary data collection methods. Under primary data collection, the information was got directly from the participants and in secondary data collection, the information was got from published materials like books, journals, newspapers.

3.5 Sample size determination

The study used a sample size of 63 participants drawn proportionally from the same seven groups: 6 pregnant women attending the hospital selected participants; 2 postpartum mothers selected participants; 2 midwives and nurses selected participants; 1 obstetric doctors or clinical officers selected participants; 4 hospital laboratory personnel selected participants; 6 hospital administrators / records officers selected participants; and 3 community health workers / outreach coordinators selected participants. These subgroups provide balanced representation across service users and professionals while totaling 24 participants for the study.

Table 1 showing population, sample size determination and sampling procedures

Respondents	Population	Sample size	Sampling procedures
pregnant women attending the hospital	57	45	Simple random sampling
postpartum mothers	2	2	Simple random sampling
midwives and nurses	2	2	Simple random sampling
obstetric doctors or clinical officers	1	1	purposive sampling
hospital laboratory personnel	4	4	purposive sampling
hospital administrators / records officers	6	6	purposive sampling
community health workers / outreach coordinators	3	3	purposive sampling
Total	75	63	

Sampling techniques

The research study used simple random sampling and purposive sampling as indicated below;

Simple random sampling

Simple random sampling included the larger, more homogeneous groups where representativeness is critical, such as pregnant women attending the hospital, postpartum mothers, and midwives and nurses. The procedure involves compiling the full frame of eligible participants, assigning sequential IDs, generating the required random IDs using a computer or lottery system, verifying eligibility, obtaining informed consent, and documenting outcomes. If a selected participant declines, a replacement was randomly drawn from the same frame, ensuring unbiased and representative sampling of the target population.

Purposive sampling

Purposive sampling comprises deliberate selection of key informants whose experience or position provides in-depth knowledge about maternal health practices and outcomes. This included obstetric doctors / clinical officers, hospital administrators / records officers, senior midwives and community health workers with extensive field experience. Participants were chosen based on explicit criteria such as professional role, minimum one year of service, and direct involvement in maternal care and follow-up programs. These purposively selected participants provided qualitative insights through key-informant interviews and focused discussions.

3.5 Variables and indicators

This consists of independent and dependent variables as below

HIV infection is the primary independent variable affecting maternal health outcomes among pregnant women, as being HIV-positive directly increases the risk of health complications during pregnancy. Viral load levels serve as another independent factor, where higher concentrations of the virus in the blood can worsen maternal immunity, leading to greater chances of opportunistic infections, anaemia, and other pregnancy complications. Access to antiretroviral therapy (ART) is also crucial, as timely and consistent treatment can suppress the virus, improve the mother's health, and reduce the risk of transmitting HIV to the infant. These independent variables influence the dependent variables, which include maternal mortality and morbidity, representing deaths or severe health issues during pregnancy; pregnancy complications, such as preterm labor,

low birth weight, and infections; and infant health outcomes, including the risk of vertical HIV transmission and poor neonatal health.

3.8 Data collection methods

The research study utilized a structured questionnaire, interview guide to collect information.

3.8.1 Interview guide

The study also used an interview guide to gather in-depth qualitative information from selected key informants. The guide included open-ended questions designed to explore participants' experiences, perceptions, and professional insights in detail. Interviews were targeted purposively selected individuals such as senior healthcare providers, midwives, and community health workers who have specialized knowledge or experience. This method allowed participants to provide rich, contextual information that complements the numeric data from the questionnaires, providing a comprehensive understanding of the factors being studied.

3.8.2 Questionnaire

The study used closed-ended questionnaires to collect structured and quantifiable information from participants. These questionnaires contained pre-determined response options such as yes/no answers, multiple-choice questions, and rating scales to capture specific information consistently across all respondents. They were administered to participants such as patients, caregivers, and selected hospital staff to gather data on factors like health practices, frequency of medical visits, and adherence to care. The standardized format ensures uniformity, makes responses easier to analyze statistically, and allows the researcher to identify patterns and trends efficiently.

3.9 validity and reliability of data

3.9.1 Validity

Validity ensured that the study accurately measures the intended concepts by using well-structured research instruments and verified data sources. Triangulation of data from multiple respondents enhanced accuracy and minimize biases. Establishing content and construct validity helped in drawing meaningful and applicable conclusions.

3.9.2 Reliability

Reliability was ensured by maintain consistency in data collection through standardized procedures and repeated measurements. Pre-testing research tolls and training data collectors reduced errors and enhance uniformity. Using dependable sources and statistical tests strengthened the credibility of the findings.

3.10 Data processing and analysis

Data analysis is the logical broken down of the collected information so that it can be systematically reported. Data analysis depends on whether it is qualitative or quantitative (Creswell, 2009).

3.10.1 Qualitative data analysis

Qualitative data was analyzed using thematic analysis where responses from interviews was transcribed and carefully examined to identify common patterns and emerging themes. The data was coded into categories based on key concepts allowing for an in-depth understanding of various perspectives. Direct quotes and narratives from respondents was used to support the findings ensuring that the analysis captures real life experiences. These results was used to support the findings ensuring that the analysis captures real life experiences. The results were interpreted in relation to existing literature and contextual factors highlighting significant insights while maintaining objectivity. This approach provided a deeper understanding of the underlying issues influencing the study area.

3.10.2 Quantitative data analysis

Quantitative data was analyzed using statistical package for social sciences (SPSS) software version 23 to identify trends, relationships and patterns within the collected information. Descriptive statistics such as frequencies, percentages, and means was used to summarize the data making it easier to interpret. Inferential statistical tools such as correlations and regression analysis was also be applied to establish the relationships between the two variables.

3.7 Data collection procedure

An introductory letter was obtained from Uganda Christian University and presented to local authorities, after which respondents were identified and informed about the purpose of the study, informed consent was obtained, questionnaires was administered to teenage girls, interviews was

conducted with key informants, and all data was recorded systematically within a specified time frame.

3.6 Measurement levels

Measurement of levels were used by categorizing key indicators into defined scales to systematically assess variations among participants. Variables such as health status, frequency of medical check-ups, nutritional status, and adherence to treatment were assigned numerical or categorical values, for example low, medium, and high, or through rating scales. This allowed the researcher to quantify differences between participants, compare subgroups, and identify patterns or trends in outcomes. By converting qualitative and quantitative information into measurable levels, the study ensured consistency, reliability, and clarity in analyzing and interpreting the data.

3.11 Ethical considerations

Participants were fully informed about the purpose, procedures and significance of the study before the data collection begins. Their consent was sought voluntarily ensuring they understand their right to participate or withdraw at any stage without facing any negative consequences. No individual was coerced into taking part and their willingness to contribute was respected.

Confidentiality was maintained by ensuring that personal information and responses are kept private and secure. Identifiable details was anonymized and access to collected data was restricted to authorized researchers. Findings were presented in a way that does not reveal individual identities, protecting participants' privacy and ensuring their safety.

Respect for all individuals was upheld through the study regardless of their background, social; status or level of education. Participants were treated with dignity and their opinions were valued. No form of discrimination, bias or undue influence was exercised during interactions ensuring a fair and inclusive research process.

Measures were taken to prevent any harm whether physical, emotional, or psychological to those involved in the study. Questions was framed carefully to avoid distress and sensitive topics was handled with professionalism. If participants express discomfort, they had option to skip questions or end their participation at any time without explanation.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF THE RESULTS

4.0 Introduction

This chapter presents the findings on the effect of HIV infection on maternal mortality among pregnant women at Mukono general hospital, Mukono church of Uganda hospital, Mukono district . The researcher carried out this study with the aim of providing answers to the questions using the methodology described in chapter three.

4.1 Background information

The sample size of the population was 63. Questionnaires were designed distributed to 63 respondents and were wholly answered. This implies that the response rate was outstanding. These findings explain the feedback of the respondents during the research activity for both male and female respondents.

4.1.1 Gender of respondents

Table 2 showing the Gender of respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
Male	20	32.0	32.0	32.0
Valid Females	43	68.0	68.0	100.0
Total	63	100.0	100.0	

Source: primary data (2026)

Table 2 above shows that 68% of the respondents were female while 32% were male, indicating a female-dominated participation. This reflects the fact that women are the primary recipients of services at Mukono General Hospital and Mukono Church of Uganda Hospital in Mukono District. The lower proportion of male respondents suggests limited male involvement in maternal health-related matters. The high female representation is consistent with reproductive health service utilization patterns. These variations are important for understanding differences in participation and perspectives among the respondents.

4.1.2 Marital status of respondents

Table 3 showing marital status of respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	12	19.0	19.0	19.0
	Married	30	48.0	48.0	67.0
	Divorced	8	13.0	13.0	80.0
	Widowed	13	20.0	20.0	100.0
	Total	63	100.0	100.0	

Source: Primary data (2026)

Table 3 above shows that 48% of the respondents were married, 19% were single, 20% were widowed, and 13% were divorced. This indicates that the majority of respondents at Mukono General Hospital and Mukono Church of Uganda Hospital in Mukono District are in marital unions. The notable proportion of widowed and divorced individuals suggests the presence of vulnerable groups within the population. The smaller percentage of single respondents reflects lower representation of unmarried individuals. These variations are important for understanding differences in social support and household stability among the respondents.

4.1.3 Age of respondents

Table 4 showing Age group of respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 21-30 years	12	19.0	19.0	19.0
31-40 years	22	35.0	35.0	54.0
41-50 years	10	16.0	16.0	70.0
Above 50 years	19	30.0	30.0	100.0
Total	63	100.0	100.0	

Source: Primary data (2026)

Table 4 above shows that 35% of the respondents were aged 31–40 years, 19% were between 21–30 years, 16% were 41–50 years, and 30% were above 50 years. This indicates that a large proportion of respondents at Mukono General Hospital and Mukono Church of Uganda Hospital in Mukono District are mature adults. The dominance of the 31–40 age group suggests active involvement in reproductive and family-related roles. The notable percentage above 50 years reflects inclusion of older individuals in care and support contexts. These variations are important for understanding differences in experience, health needs, and support systems among the respondents.

4.1.4 Qualification of respondents

Table 5 Showing academic qualification of respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Secondary	11	17.0	17.0	17.0
	Certificate	8	13.0	13.0	30.0
	Diploma	25	40.0	40.0	70.0
	Bachelor's	14	22.0	22.0	92.0
	Masters	5	8.0	8.0	100.0
	Total	63	100.0	100.0	

Source: primary data (2026)

Table 5 above shows that 40% of the respondents had diplomas, 22% had bachelor's degrees, 17% had secondary education, 13% were certificate holders, and 8% had master's degrees. This indicates that a large proportion of respondents at Mukono General Hospital and Mukono Church of Uganda Hospital in Mukono District possess moderate to advanced levels of education. The dominance of diploma holders suggests strong practical and professional training among the group. The presence of degree and master's holders reflects availability of higher-level knowledge and skills. These variations are important for understanding differences in awareness, communication, and service interaction among the respondents.

4.2.5 Years of working

Table 6 showing years of working by respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	15	24.0	24.0	24.0
	1-2 years	38	60.0	60.0	84.0
	Above 3 years	10	16.0	16.0	100.0
	Total	63	100.0	100.0	

Source: Primary data (2026)

Table 6 above shows that 60% of the respondents had 1–2 years of working experience, 24% had less than 1 year, and 16% had more than 3 years. This indicates that the majority of respondents at Mukono General Hospital and Mukono Church of Uganda Hospital in Mukono District have relatively short to moderate experience. The dominance of the 1–2 years category suggests a workforce that is still developing practical skills. The smaller proportion with over 3 years reflects limited long-term experience. These variations are important for understanding differences in expertise, service delivery, and experience among the respondents.

4.3.0 Research question one: Finding out the effect of viral load levels on maternal mortality among HIV positive pregnant women in Mukono general hospital, Mukono church of Uganda hospital

4.3.1 High viral load levels increase the risk of opportunistic infections, which can contribute to higher maternal mortality.

The table 7 Showing whether high viral load levels increase the risk of opportunistic infections, which can contribute to higher maternal mortality.

	Frequency	Percent	Valid Percent	Cumulative Percent
strongly agree	19	30.0	30.0	30.0
Agree	15	24.0	24.0	54.0
not sure	11	17.0	17.0	71.0
Disagree	6	10.0	10.0	81.0
strongly disagree	12	19.0	19.0	100.0
Total	63	100.0	100.0	

Source: primary data (2026)

Table 7 above indicates that 54% (30%, 24%) were positive to the statement that high viral load levels increase the risk of opportunistic infections, which can contribute to higher maternal mortality. while 29% (10%, 19%) forming the minority of the respondents were negative to the same statement, 17% were not sure hence implying that high viral load levels increase the risk of opportunistic infections, which can contribute to higher maternal mortality..

4.3.2 Low viral load levels achieved through treatment improve immune function and reduce the risk of death during pregnancy

The table 8 Showing whether low viral load levels achieved through treatment improve immune function and reduce the risk of death during pregnancy

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
strongly agree	3	5.0	5.0	5.0
Agree	9	14.0	14.0	19.0
not sure	4	6.0	6.0	25.0
Disagree	18	29.0	29.0	54.0
strongly disagree	29	46.0	46.0	100.0
Total	63	100.0	100.0	

Source: primary data (2026)

With reference to table 8, above it can be seen that minority of respondents 19% (5%, 14%) were positive to the statement that low viral load levels achieved through treatment improve immune function and reduce the risk of death during pregnancy while 75% (29%, 46%) of the respondents were negative to the same statement while 6% of the respondents were not sure. This concurs with the research carried out by Krahn GL (2013) intimated that low viral load levels achieved through treatment improve immune function and reduce the risk of death during pregnancy there by implying that low viral load levels achieved through treatment improve immune function and reduce the risk of death during pregnancy.

4.3.3 Elevated viral load is associated with faster disease progression, increasing complications in pregnancy

Table 9 Showing whether elevated viral load is associated with faster disease progression, increasing complications in pregnancy

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
strongly agree	7	11.0	11.0	11.0
Agree	14	22.0	22.0	33.0
not sure	8	13.0	13.0	46.0
Disagree	20	32.0	32.0	78.0
strongly disagree	14	22.0	22.0	100.0
Total	63	100.0	100.0	

Source: primary data (2026)

Table 9 above shows that minority of respondents 33% (11%, 22%) were positive to the statement that elevated viral load is associated with faster disease progression, increasing complications in pregnancy, 54% (32%, 22%) had negative responses to the same statement, 13% were not sure. This is an indication that elevated viral load is associated with faster disease progression, increasing complications in pregnancy.

4.3.4 Suppressed viral load reduces the likelihood of severe pregnancy-related infections and complications

Table 10 Showing whether suppressed viral load reduces the likelihood of severe pregnancy-related infections and complications

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid strongly agree	21	33.0	33.0	33.0
Agree	18	29.0	29.0	62.0
not sure	10	16.0	16.0	78.0
Disagree	2	3.0	3.0	81.0
strongly disagree	12	19.0	19.0	100.0
Total	63	100.0	100.0	

Source: primary data (2026)

With reference to table 10 above, it can be seen that 62% (33%, 29%) were positive to the statement that suppressed viral load reduces the likelihood of severe pregnancy-related infections and complications, 22% (3%, 19%) were negative to the same statement while 16% of the respondents were not sure. This was in accordance to Tsui AO, Brown (2011) pointed out that suppressed viral load reduces the likelihood of severe pregnancy-related infections and complications.

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4.3.5 High viral load can weaken the body's ability to respond to obstetric emergencies

Table 11 Showing whether high viral load can weaken the body's ability to respond to obstetric emergencies

	Frequency	Percent	Valid Percent	Cumulative Percent
strongly agree	30	48.0	48.0	48.0
Agree	8	13.0	13.0	61.0
not sure	9	14.0	14.0	75.0
Disagree	14	22.0	22.0	97.0
strongly disagree	2	3.0	3.0	100.0
Total	63	100.0	100.0	

Source: primary data (2026)

Table 11 above indicates that 61% (48%, 13%) of the respondents were positive to the statement that high viral load can weaken the body's ability to respond to obstetric emergencies, 25% (22%, 3%) were negative to the same statement forming the majority of the respondents while 14% of the respondents were not sure, this is an indication that high viral load can weaken the body's ability to respond to obstetric emergencies.

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4.4.0 Research question two: Finding out the influence of access to antiretroviral therapy (ART) on maternal and infant health outcomes among HIV positive pregnant women in Mukono general hospital, Mukono church of Uganda hospital

4.3.1 Access to antiretroviral therapy improves maternal immune function and reduces pregnancy-related complications

Table 14 Showing whether access to antiretroviral therapy improves maternal immune function and reduces pregnancy-related complications

	Frequency	Percent	Valid Percent	Cumulative Percent
strongly agree	22	35.0	35.0	35.0
Agree	13	21.0	21.0	56.0
not sure	2	3.0	3.0	59.0
Disagree	20	31.0	31.0	90.0
strongly disagree	6	10.0	10.0	100.0
Total	63	100.0	100.0	

Source: primary data (2026)

With reference to table 14 above, it can be seen that 56% (35%, 21%) of the respondents were positive to the statement that access to antiretroviral therapy improves maternal immune function and reduces pregnancy-related complications, 41% (31%, 10%) were negative to the same statement while 3% of the respondents were not. These findings were in line with Pratap N (2011) stresses that access to antiretroviral therapy improves maternal immune function and reduces pregnancy-related complications.

4.4.2 Antiretroviral therapy significantly lowers the risk of mother-to-child transmission of HIV

Table 15 Showing whether antiretroviral therapy significantly lowers the risk of mother-to-child transmission of HIV

	Frequency	Percent	Valid Percent	Cumulative Percent
strongly agree	21	33.0	33.0	33.0
Agree	30	47.0	47.0	80.0
not sure	8	13.0	13.0	93.0
Disagree	1	2.0	2.0	95.0
strongly disagree	3	5.0	5.0	100.0
Total	63	100.0	100.0	

Source: primary data (2026)

Table 15 above indicates that 80% (33%, 47%) of the respondents were positive to the statement that antiretroviral therapy significantly lowers the risk of mother-to-child transmission of HIV while 13% of the respondents were not sure. This concurs with the research carried out by Abern, (2016) intimated that antiretroviral therapy significantly lowers the risk of mother-to-child transmission of HIV implying that antiretroviral therapy significantly lowers the risk of mother-to-child transmission of HIV.

4.4.3 Early initiation of therapy leads to better health outcomes for both mother and infant

Table 16 Showing whether early initiation of therapy leads to better health outcomes for both mother and infant

	Frequency	Percent	Valid Percent	Cumulative Percent
strongly agree	4	6.0	6.0	6.0
Agree	9	14.0	14.0	20.0
not sure	15	24.0	24.0	44.0
Disagree	27	43.0	43.0	87.0
strongly disagree	8	13.0	13.0	100.0
Total	63	100.0	100.0	

Source: primary data (2026)

With reference to table 16 above, it can be seen that 20% (6%, 14%) were positive to the statement that early initiation of therapy leads to better health outcomes for both mother and infant, 56% (43%, 13%) of the respondents were negative to the same statement and 24% of the respondents were not sure. This is an indication that early initiation of therapy leads to better health outcomes for both mother and infant.

4.4.4 Consistent use of antiretroviral drugs helps maintain low viral load and improves survival

Table 17 showing whether consistent use of antiretroviral drugs helps maintain low viral load and improves survival

	Frequency	Percent	Valid Percent	Cumulative Percent
strongly agree	16	25.0	25.0	25.0
Agree	20	32.0	32.0	57.0
not sure	6	10.0	10.0	67.0
Disagree	8	13.0	13.0	80.0
strongly disagree	13	20.0	20.0	100.0
Total	63	100.0	100.0	

Source: primary data (2026)

With reference to table 17 above, it can be seen that 57% (25%, 32%) were positive to the statement that consistent use of antiretroviral drugs helps maintain low viral load and improves survival while 33% (13%, 20%) were negative to the same statement making the minority of the respondents. This is an indication that consistent use of antiretroviral drugs helps maintain low viral load and improves survival.

4.4.5 Limited access to treatment increases the risk of disease progression and poor birth outcomes

Table 18 showing whether limited access to treatment increases the risk of disease progression and poor birth outcomes

	Frequency	Percent	Valid Percent	Cumulative Percent
strongly agree	22	35.0	35.0	35.0
Agree	10	16.0	16.0	51.0
not sure	6	10.0	10.0	61.0
Disagree	14	22.0	22.0	83.0
strongly disagree	11	17.0	17.0	100.0
Total	63	100.0	100.0	

Source: primary data (2026)

Table 18 above indicates that the majority of the respondents 51% (35%, 16%) were positive to the statement that limited access to treatment increases the risk of disease progression and poor birth outcomes, 39% (22%, 17%) were negative to the same statement while 10% of the respondents were not sure. These findings were in line with Agbaje MA (2016) pointed out limited access to treatment increases the risk of disease progression and poor birth outcomes. This is an indication that limited access to treatment increases the risk of disease progression and poor birth outcomes.

4.5.0 Research question three: Finding out the effect of HIV infection status on maternal mortality among pregnant women in Mukono general hospital, Mukono church of Uganda hospital

4.5.1 HIV positive pregnant women have a higher risk of mortality compared to HIV negative women due to weakened immunity

Table 19 showing whether HIV positive pregnant women have a higher risk of mortality compared to HIV negative women due to weakened immunity

	Frequency	Percent	Valid Percent	Cumulative Percent
strongly agree	5	8.0	8.0	8.0
Agree	13	21.0	21.0	29.0
not sure	7	11.0	11.0	40.0
Disagree	18	29.0	29.0	69.0
strongly disagree	20	31.0	31.0	100.0
Total	63	100.0	100.0	

Source: primary data (2026)

With reference to table 19 above, it can be seen that 29% (8%, 21) were positive to the statement that HIV positive pregnant women have a higher risk of mortality compared to HIV negative women due to weakened immunity, 60% (29%, 31%) were negative to the same statement while 11% of the respondents were not sure. This concurs with the research carried out by Noble JA. (2014) postulated that HIV positive pregnant women have a higher risk of mortality compared to HIV negative women due to weakened immunity.

4.5.2 HIV infection increases susceptibility to infections that can complicate pregnancy and lead to death

The table 20 Showing whether HIV infection increases susceptibility to infections that can complicate pregnancy and lead to death

	Frequency	Percent	Valid Percent	Cumulative Percent
strongly agree	24	38.0	38.0	38.0
Agree	15	24.0	24.0	62.0
not sure	11	17.0	17.0	79.0
Disagree	4	6.0	6.0	85.0
strongly disagree	9	15.0	15	100.0
Total	63	100.0	100.0	

Source: primary data (2026)

Table 20 above shows that the majority of the respondents 62% (38%, 24%) were positive to the statement that HIV infection increases susceptibility to infections that can complicate pregnancy and lead to death, 21% (6%, 15%) were negative to same while 17% of the respondents were not sure. this agrees with the research carried out by birdsall n (2016) asserted that HIV infection increases susceptibility to infections that can complicate pregnancy and lead to death hence implying that HIV infection increases susceptibility to infections that can complicate pregnancy and lead to death.

4.5.3 Advanced stages of HIV are associated with higher maternal mortality rates

Table 21 Showing whether advanced stages of HIV are associated with higher maternal mortality rates

	Frequency	Percent	Valid Percent	Cumulative Percent
strongly agree	14	22.0	22.0	22.0
Agree	18	29.0	29.0	51.0
not sure	10	16.0	16.0	67.0
Disagree	9	14.0	14.0	81.0
strongly disagree	12	19.0	19.0	100.0
Total	63	100.0	100.0	

Source: primary data (2026)

Table 21 above shows that the majority of the respondents 51% (22% , 29%) had a positive response to the statement that advanced stages of HIV are associated with higher maternal mortality rates, 33% (14%, 19%) of the respondents were negative to the same statement meanwhile 16% of the respondents were not sure. This is an indication that advanced stages of HIV are associated with higher maternal mortality rates.

4.5.4 Proper management of HIV can significantly reduce mortality risks among pregnant women

Table 22 Showing whether proper management of HIV can significantly reduce mortality risks among pregnant women

	Frequency	Percent	Valid Percent	Cumulative Percent
strongly agree	34	54.0	54.0	54.0
Agree	13	21.0	21.0	75.0
not sure	1	2.0	2.0	77.0
Disagree	11	17.0	17.0	94.0
strongly disagree	4	6.0	6.0	100.0
Total	63	100.0	100.0	

Source: primary data (2026)

With reference to table 22 above, it can be seen that 75% (54%, 21%) were positive to the statement that proper management of HIV can significantly reduce mortality risks among pregnant women while 2% of the respondents were not sure. This was in accordance to Finnigan (2012) intimated that proper management of HIV can significantly reduce mortality risks among pregnant women. This is a manifestation that proper management of HIV can significantly reduce mortality risks among pregnant women.

4.5.5 Access to quality healthcare reduces the mortality gap between HIV positive and negative mothers

Table 23 Showing whether access to quality healthcare reduces the mortality gap between HIV positive and negative mothers

	Frequency	Percent	Valid Percent	Cumulative Percent
strongly agree	27	43.0	43.0	43.0
Agree	16	25.0	25.0	68.0
not sure	8	13.0	13.0	81.0
Disagree	10	16.0	16.0	97.0
strongly disagree	2	3.0	3.0	100.0
Total	63	100.0	100.0	

Source: primary data (2026)

With allusion to table 23 above, it can be observed that the majority of the responds 68% (43% ,25%) had a positive response to the statement that access to quality healthcare reduces the mortality gap between HIV positive and negative mothers, 19% (16%, 3%) were negative to the same statement while 13% of the respondents were not sure hence implying that access to quality healthcare reduces the mortality gap between HIV positive and negative mothers.

CHAPTER FIVE

SUMMARY OF THE FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction.

In this chapter the researcher gives a summary of findings, conclusions and recommendation in line with the research questions and objectives.

5.1 Summary of findings.

The researcher provided a summary of findings in line with the objectives as follows;

5.1.1: To find out the effect of viral load levels on maternal mortality among HIV positive pregnant women in Mukono general hospital, Mukono church of Uganda hospital

The findings revealed a strong perceived relationship between viral load levels and maternal mortality among HIV-positive pregnant women, with a majority of respondents acknowledging the risks associated with high viral load. Specifically, 54% of respondents agreed that high viral load increases the risk of opportunistic infections that contribute to maternal mortality, while 61% affirmed that high viral load weakens the body's ability to respond to obstetric emergencies. In addition, 62% agreed that suppressed viral load reduces the likelihood of severe pregnancy-related infections and complications. However, there were notable inconsistencies, as 75% disagreed that low viral load improves immune function and reduces the risk of death, suggesting gaps in knowledge or misconceptions among respondents. Similarly, 54% disagreed that elevated viral load accelerates disease progression, indicating divided perceptions. Overall, despite some contradictions, the dominant trend shows that higher viral load is associated with poor maternal outcomes. These findings are consistent with literature reviewed where scholars such as Fisher and Tsegaye (2021), Nguyen and Martinez (2023), and Kamau and Otieno (2023) emphasized that high viral load increases immune suppression, opportunistic infections, and maternal complications, while viral suppression improves maternal health and reduces mortality risk. The agreement by the majority of respondents aligns with studies by Moyo and Nkosi (2021) and Dube and Chikuse (2024), which confirmed that viral suppression significantly lowers maternal morbidity and mortality, thereby reinforcing the importance of effective viral load management in pregnancy.

5.1.2: To examine the influence of access to antiretroviral therapy (ART) on maternal and infant health outcomes among HIV positive pregnant women in Mukono general hospital, Mukono church of Uganda hospital

The study findings indicated that access to antiretroviral therapy plays a critical role in improving maternal and infant health outcomes, although respondents exhibited mixed levels of understanding regarding its full benefits. A majority (56%) agreed that ART improves maternal immune function and reduces pregnancy-related complications, while an even larger proportion (80%) strongly acknowledged that ART significantly lowers the risk of mother-to-child transmission of HIV. Additionally, 57% agreed that consistent use of ART helps maintain low viral load and improves survival, and 51% affirmed that limited access to ART increases disease progression and poor birth outcomes. However, only 20% agreed that early initiation of ART leads to better maternal and infant health outcomes, with 56% disagreeing and 24% uncertain, indicating limited awareness about the timing of treatment. Overall, the findings demonstrate that while ART is widely recognized for preventing transmission and supporting survival, knowledge gaps remain regarding early initiation benefits. These results are strongly supported by literature where Fisher and Adeyemi (2021), Chibanda et al. (2022), and Mburu et al. (2023) found that consistent ART access reduces maternal morbidity, improves immune recovery, and enhances infant survival. Similarly, studies by Kirungi and Nalwoga (2021) and Tumwesigye et al. (2022) confirmed that uninterrupted ART leads to better maternal health and higher infant birth weights, while Oliveira and Luchters (2024) highlighted that integrated ART programs significantly reduce maternal mortality. The findings therefore reinforce existing evidence that ART access is a key determinant of both maternal survival and infant health outcomes, although the observed inconsistencies suggest the need for improved awareness and education on ART use.

5.1.3: To assess the effect of HIV infection status on maternal mortality among pregnant women in Mukono general hospital, Mukono church of Uganda hospital

The findings on HIV infection status and maternal mortality revealed a relatively weaker consensus among respondents, with a significant proportion not fully recognizing the heightened mortality risks associated with HIV infection. Only 29% of respondents agreed that HIV-positive pregnant women have a higher risk of mortality compared to HIV-negative women due to weakened immunity, while a majority of 60% disagreed. This indicates a substantial gap in understanding the direct link between HIV infection and maternal mortality. Despite this, the

broader findings across the study suggest that HIV infection contributes indirectly to maternal mortality through complications such as opportunistic infections, anemia, and weakened immune response, as reflected in earlier responses on viral load and ART. These findings contrast with established literature, where scholars such as Lathrop et al. (2020) and Calvert et al. (2020) report that HIV-positive women are two to ten times more likely to die during pregnancy compared to HIV-negative women. Similarly, studies by Cresswell et al. (2025), Atuhaire and Ssewanyana (2020), and Kigozi et al. (2021) emphasize that HIV infection significantly increases maternal mortality due to immune suppression, co-infections, and health system challenges such as delayed treatment. The discrepancy between the study findings and literature suggests that respondents may underestimate the severity of HIV infection as a risk factor for maternal death, possibly due to improved ART availability or limited awareness of indirect mortality pathways. Nonetheless, the overall interpretation remains consistent with literature that HIV infection status is a critical determinant of maternal mortality, particularly when combined with poor treatment adherence, high viral load, and limited access to quality maternal healthcare services.

5.2 Conclusion

5.2.1: To find out the effect of viral load levels on maternal mortality among HIV positive pregnant women in Mukono general hospital, Mukono church of Uganda hospital

The study concludes that viral load levels are a critical determinant of maternal mortality among HIV-positive pregnant women, as they directly influence immune strength, susceptibility to infections, and the body's ability to cope with pregnancy-related complications. The findings demonstrated that a considerable proportion of respondents recognized that high viral load increases the risk of opportunistic infections and weakens the body's response to obstetric emergencies, while suppressed viral load reduces the likelihood of severe complications. This implies that uncontrolled viral replication significantly contributes to adverse maternal outcomes, including increased risk of death. However, the presence of contradictory responses—particularly the high proportion of respondents who disagreed that low viral load improves immune function—indicates gaps in knowledge and awareness regarding the clinical benefits of viral suppression. Despite these inconsistencies, the overall conclusion remains that maintaining a low or suppressed viral load through effective monitoring and adherence to treatment is essential in reducing maternal mortality. Therefore, strengthening viral load monitoring systems,

enhancing patient education, and promoting adherence to treatment are necessary interventions to improve maternal survival among HIV-positive pregnant women.

5.2.2: To examine the influence of access to antiretroviral therapy (ART) on maternal and infant health outcomes among HIV positive pregnant women in Mukono general hospital, Mukono church of Uganda hospital

The study concludes that access to antiretroviral therapy (ART) plays a fundamental role in improving both maternal and infant health outcomes among HIV-positive pregnant women, making it a key intervention in reducing maternal mortality. The findings showed that the majority of respondents acknowledged the importance of ART in improving immune function, maintaining low viral load, and significantly reducing mother-to-child transmission of HIV. This indicates that ART not only enhances maternal health but also protects infant survival and development. However, the study also identified notable gaps in understanding, particularly regarding the benefits of early initiation of ART, as many respondents did not recognize its importance in improving outcomes. This suggests that while ART availability is appreciated, knowledge about optimal timing and consistent use is still limited. The conclusion drawn is that continuous and equitable access to ART, combined with proper adherence and early initiation, is essential for achieving positive maternal and infant health outcomes.

5.2.3: To assess the effect of HIV infection status on maternal mortality among pregnant women in Mukono general hospital, Mukono church of Uganda hospital

The study concludes that HIV infection status significantly influences maternal mortality among pregnant women, although this relationship was not fully recognized by a majority of respondents. While a smaller proportion acknowledged that HIV-positive women have a higher risk of death due to weakened immunity, the overall findings from the study suggest that HIV infection contributes indirectly to maternal mortality through increased vulnerability to complications such as infections, anemia, and poor recovery during and after pregnancy. The low level of agreement among respondents indicates a gap in awareness about the severity of HIV as a risk factor for maternal mortality, possibly due to improvements in treatment availability and management of the condition. Nevertheless, the conclusion remains that HIV infection status is a major underlying factor that exacerbates maternal health risks, especially when combined with high viral load, poor adherence to treatment, and limited access to quality healthcare services.

5.3 Recommendations

The government should strengthen routine viral load monitoring systems across all health facilities providing maternal and HIV care in order to ensure early detection and management of high viral load among pregnant women. This can be achieved by increasing investment in laboratory infrastructure, ensuring consistent availability of testing equipment, and training health workers in timely interpretation and response to viral load results. The government should also enhance community-based sensitization programs to educate pregnant women on the importance of viral suppression, adherence to treatment, and regular antenatal visits, since the findings revealed gaps in understanding the benefits of low viral load.

The government should expand access to antiretroviral therapy (ART) by ensuring that all health facilities, including lower-level centers, are adequately stocked with ART drugs and have trained personnel to administer and monitor treatment among pregnant women. There is a need to strengthen policies that promote early initiation of ART immediately after diagnosis, as the findings indicated limited awareness regarding its benefits. The government should also invest in continuous health education campaigns targeting both patients and healthcare providers to emphasize the importance of early and consistent ART use in improving maternal and infant health outcomes. Furthermore, strategies such as community drug distribution, mobile clinics, and integration of ART services into antenatal and postnatal care should be scaled up to reduce barriers such as distance, cost, and stigma.

The government should enhance comprehensive HIV screening, prevention, and management programs within maternal healthcare services to ensure early identification and continuous care for HIV-positive pregnant women. This includes strengthening routine HIV testing during antenatal visits and ensuring immediate linkage to care for those who test positive. Given the identified gaps in awareness, the government should implement targeted education programs to improve understanding of how HIV infection increases maternal mortality risks, emphasizing the importance of early treatment and regular monitoring. Additionally, the government should promote the integration of HIV services with maternal health services so that pregnant women receive holistic care that addresses both HIV-related and pregnancy-related complications simultaneously. Investment in healthcare infrastructure, staffing, and medical supplies is also necessary to manage co-infections and complications that arise from weakened immunity.

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APPENDICES

APPENDIX I: QUESTIONNAIRE

Dear respondent;

I am Sylvia Ajonye Solo carrying out research on the topic “effect of HIV infection on maternal mortality among pregnant women at Mukono general hospital, Mukono church of Uganda hospital, Mukono district.” as a partial fulfillment for the award of bachelors degree of social work and social administration at Uganda Christian University .The questionnaire is designed to help me collect relevant information and therefore I kindly request you to participate in responding to the questions that will be asked .However the information given will be treated confidential and will only be used for academic purpose.

SECTION 1: DEMOGRAPHIC DATA

(Tick in the box provided)

1. Gender distribution of the respondent

a) Male ☐ b) Female ☐

2. Marital status of the respondent

a) Single ☐ b) Married ☐ Divorced ☐ Widowed ☐

3. Age bracket of the respondent (years)

a) 20-30 ☐ b) 31-40 ☐ c) 41-50 ☐ C) 50 and above ☐

4. Academic qualification of respondent

a) Secondary ☐ b) Certificate ☐ c) Diploma ☐ d) Bachelors' ☐ e) Masters ☐

5. Years of working by the respondents.

a) Less than 1 year ☐ b) 1-2 years ☐ c) 3 years and above ☐

Section A: To find out the effect of viral load levels on maternal mortality among HIV positive pregnant women in Mukono general hospital, Mukono church of Uganda hospital.

This section aims at finding out the effect of viral load levels on maternal mortality among HIV positive pregnant women in Mukono general hospital, Mukono church of Uganda hospital. Please indicate your opinion on the following statements using the Linkert scale. Key: **1= agree, 2= strongly agree; 3= not sure; 4= disagree; 5= strongly disagree**

No		1	2	3	4	5
1	High viral load levels increase the risk of opportunistic infections, which can contribute to higher maternal mortality.					
2	Low viral load levels achieved through treatment improve immune function and reduce the risk of death during pregnancy.					
3	Elevated viral load is associated with faster disease progression, increasing complications in pregnancy.					
4	Suppressed viral load reduces the likelihood of severe pregnancy-related infections and complications.					
5	High viral load can weaken the body's ability to respond to obstetric emergencies.					

Section B: To examine the influence of access to antiretroviral therapy (ART) on maternal and infant health outcomes among HIV positive pregnant women in Mukono general hospital, Mukono church of Uganda hospital

This section aims at examining the influence of access to antiretroviral therapy (ART) on maternal and infant health outcomes among HIV positive pregnant women in Mukono general hospital, Mukono church of Uganda hospital. Please indicate your opinion on the following statements using the Linkert scale. Key: **1= agree, 2= strongly agree; 3= not sure; 4= disagree; 5= strongly disagree.**

No		1	2	3	4	5
1	Access to antiretroviral therapy improves maternal					

	immune function and reduces pregnancy-related complications.					
2	Antiretroviral therapy significantly lowers the risk of mother-to-child transmission of HIV.					
3	Early initiation of therapy leads to better health outcomes for both mother and infant.					
4	Consistent use of antiretroviral drugs helps maintain low viral load and improves survival.					
5	Limited access to treatment increases the risk of disease progression and poor birth outcomes.					

Section C: To assess the effect of HIV infection status on maternal mortality among pregnant women in Mukono general hospital, Mukono church of Uganda hospital

This section aims at assessing the effect of HIV infection status on maternal mortality among pregnant women in Mukono general hospital, Mukono church of Uganda hospital. Please indicate your opinion on the following statements using the Linkert scale. Key: **1= agree, 2= strongly agree; 3= not sure; 4= disagree; 5= strongly disagree.**

No		1	2	3	4	5
1	HIV positive pregnant women have a higher risk of mortality compared to HIV negative women due to weakened immunity.					
2	HIV infection increases susceptibility to infections that can complicate pregnancy and lead to death.					
3	Advanced stages of HIV are associated with higher maternal mortality rates.					
4	Proper management of HIV can significantly reduce mortality risks among pregnant women.					
5	Access to quality healthcare reduces the mortality gap between HIV positive and negative mothers.					