

# The Efficacy of the Prevention of Mother-to-Child Transmission (PMTCT) Program in Mitigating Pediatric HIV/AIDS Incidence in the Mansa District, Zambia

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## ABSTRACT

This qualitative study was set out to intricately explore the landscape of the Prevention of Mother-to-Child Transmission (PMTCT) program in the Mansa district in order to shed light on its multifaceted nature. Key informants, pivotal to the program, offered invaluable insights into its fundamental components, recent progress, encountered challenges, and proposed improvements. The study emphasized the paramount importance of early detection and timely intervention in preventing HIV transmission from mother to child. The study highlighted key areas of focus within the PMTCT program, as elucidated by informants, emphasizing the central role of antenatal care, HIV testing and counseling, provision of antiretroviral therapy (ART), and vigilant postnatal follow-up. Together, these elements constituted a comprehensive strategy for safeguarding maternal and child well-being, with a strong emphasis on early identification and effective intervention.

Recent developments in the program portrayed an evolving landscape, including enhancements such as improved access to rapid testing, the integration of maternal and child health services, expanded community outreach efforts, and initiatives aimed at enhancing community awareness. These innovations underscored the program's adaptability and unwavering commitment to extending its reach. However, the challenges that impeded the reduction of mother-to-child HIV transmission were deeply rooted and multifaceted, encompassing issues such as stigma, inadequacies in healthcare infrastructure, medication adherence challenges, geographic barriers, personnel shortages, and logistical complexities.

In response to these challenges, key informants put forth practical recommendations to strengthen the PMTCT program. These recommendations included broader community awareness and education efforts, the fortification of peer support networks, increased allocation of resources for transportation, and continuous training and sensitization programs for healthcare providers. These measures were deemed vital for enhancing program effectiveness and improving the health outcomes of mothers and infants in the Mansa district.

**Key Words:** Prevention of Mother to Child Transmission, Human Immune Virus, Acquired Immune Deficiency Syndrome.

## INTRODUCTION

This chapter serves as the foundational framework upon which the research study is constructed. It comprehensively addresses critical elements intrinsic to scholarly investigation, including the contextual background, articulation of the research problem, formulation of research objectives, delineation of research

questions, explication of the study's significance, and delineation of the scope and limitations inherent to the research endeavor.

## Background of the study

HIV infection among children is predominantly transmitted through mother-to-child transmission (MTCT). While the prevention of mother-to-child transmission strategy has shown significant effectiveness, its accessibility and utilization face various challenges, including a lack of knowledge among stakeholders. The Acquired Immune Deficiency Syndrome (AIDS) epidemic is a formidable global challenge in the 21st century. AIDS was first identified in 1981 and is caused by the human immunodeficiency virus (HIV), isolated in the USA by the end of 1983 (WHO; 2006). In 2009, nearly 400,000 children under the age of 15 were infected with HIV (UNAIDS; 2010). Globally, the majority of MTCT infections occurred in Sub-Saharan Africa, with over 90% resulting from mother-to-child transmission (MTCT) during various stages, including pregnancy, labor and delivery, and breastfeeding. Transmission rates during pregnancy, labor, and delivery are estimated at 5-10%, 10-20%, and 10-15% during breastfeeding (Dabis, 1995). Without interventions, there is a 20-45% chance that a baby born to an HIV-infected mother will become infected (WHO; 2006).

The risk of MTCT can be significantly reduced, down to 2%, through the comprehensive implementation of Prevention of Mother-to-Child Transmission (PMTCT) strategies (De Cock KM, MG Fowler, Mercier E 2000). These comprehensive approaches encompass primary prevention of HIV among women of childbearing age and their partners, preventing unintended pregnancies among HIV-infected women, averting HIV transmission from mothers to infants, and providing treatment, care, and support to HIV-infected women, their partners, infants, and families. In summary, MTCT of HIV has a profoundly detrimental impact on child survival, underscoring the critical importance of PMTCT (WHO; 2006).

In Africa, HIV infection among children is predominantly transmitted through mother-to-child transmission (MTCT). Despite the proven effectiveness of the prevention of mother-to-child transmission strategy, accessibility and utilization are hindered by various factors, including a lack of knowledge among stakeholders.

The Acquired Immune Deficiency Syndrome (AIDS) epidemic poses a significant challenge to the African continent in the 21st century. AIDS was first identified in 1981, caused by the human immunodeficiency virus (HIV), which was isolated in the USA by the end of 1983 (WHO; 2006). In 2009, nearly 400,000 children under the age of 15 were infected with HIV (UNAIDS; 2010). Sub-Saharan Africa bears the brunt of the global HIV epidemic, with over 90% of MTCT infections occurring in this region, during pregnancy, labor and delivery, and breastfeeding. Transmission rates are estimated at 5-10% during pregnancy, 10-20% during labor and delivery, and 10-15% during breastfeeding (Dabis, 1995). Without interventions, there is a 20-45% chance that a baby born to an HIV-infected mother will become infected (WHO, 2006).

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In Southern Africa, HIV infection among children is primarily transmitted through mother-to-child transmission (MTCT). Despite the proven effectiveness of the prevention of mother-to-child transmission

strategy, its accessibility and utilization are hampered by various factors, including a lack of knowledge among stakeholders. The Acquired Immune Deficiency Syndrome (AIDS) epidemic presents a significant challenge to Southern Africa in the 21st century. AIDS was first identified in 1981, caused by the human immunodeficiency virus (HIV), which was isolated in the USA by the end of 1983 (WHO, 2006). In 2009, nearly 400,000 children under the age of 15 were infected with HIV (UNAIDS, 2010). Southern Africa is severely affected by the HIV epidemic, with over 90% of MTCT infections occurring in this region, during various stages such as pregnancy, labor and delivery, and breastfeeding. Transmission rates are estimated at 5-10% during pregnancy, 10-20% during labor and delivery, and 10-15% during breastfeeding (Dabis, 1995). Without interventions, there is a 20-45% chance that a baby born to an HIV-infected mother will become infected (WHO, 2006).

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In Zambia, HIV infection among children is primarily transmitted through mother-to-child transmission (MTCT). Despite the proven effectiveness of the prevention of mother-to-child transmission strategy, its accessibility and utilization face various challenges, including a lack of knowledge among stakeholders. The Acquired Immune Deficiency Syndrome (AIDS) epidemic presents a significant challenge to Zambia in the 21st century. AIDS was first identified in 1981, caused by the human immunodeficiency virus (HIV), which was isolated in the USA by the end of 1983 (WHO, 2006). In 2009, nearly 400,000 children under the age of 15 were infected with HIV (UNAIDS, 2010). Zambia, like many other Southern African countries, bears a substantial burden of the HIV epidemic, with over 90% of MTCT infections occurring locally, during various stages such as pregnancy, labor and delivery, and breastfeeding. Transmission rates are estimated at 5-10% during pregnancy, 10-20% during labor and delivery, and 10-15% during breastfeeding (Dabis, 1995). Without interventions, there is a 20-45% chance that a baby born to an HIV-infected mother will become infected (WHO, 2006).

### **Statement of the Problem**

Globally, the transmission of HIV from mother to child (MTCT) is responsible for over 90 percent of new HIV infections in children (De Cock, 2000). In Zambia, the risk of infants born to HIV-positive mothers contracting the virus remains a persistent concern. In 2014, it was estimated that 9 percent of child HIV infections in Zambia were due to mother-to-child transmission. To put this into perspective, approximately 7,300 children contracted HIV in 2017 (CSO, 2017). Despite commendable government efforts to reduce MTCT of HIV, children's vulnerability to infection from their HIV-positive mothers remains unacceptably high. This issue is compounded by the global target of reducing new HIV infections through MTCT by 90 percent by 2025, an objective that still seems distant. Consequently, children continue to face the risk of HIV transmission during pregnancy, childbirth, and breastfeeding. As a result, the primary objective of this study is to critically evaluate the effectiveness of the Prevention of Mother-to-Child Transmission (PMTCT) program in Zambia, with the overarching goal of reducing the prevalence of HIV/AIDS among children.

### **Objectives of the Study**

This study was guided by the following research objectives:

## General Objective

To assess the effectiveness of the Prevention of Mother-to-Child Transmission program in reducing HIV/AIDS prevalence among children in the Mansa district.

## Specific Objectives

1. To identify the primary areas of focus within the PMTCT program for reducing Mother-to-Child Transmission of HIV in the Mansa district.
2. To identify the challenges that hinder the successful reduction of Mother-to-Child Transmission of HIV in the Mansa district.
3. To propose substantive strategic measures for enhancing the PMTCT program in the Mansa district, with the aim of achieving more effective outcomes in preventing HIV/AIDS transmission from mothers to children.

## Research Questions

1. What are the key areas of emphasis within the PMTCT program aimed at mitigating Mother-to-Child Transmission of HIV in the Mansa district?
2. What are the specific challenges that act as impediments to the successful reduction of Mother-to-Child Transmission of HIV in the Mansa district?
3. What actionable measures should be taken to enhance the PMTCT program in the Mansa district in preventing HIV/AIDS transmission from mothers to children?

## Significance and Relevance of the Study

This study carries significant implications as it endeavors to safeguard newborn children from HIV transmission, an imperative in curbing the epidemic's propagation. Furthermore, policymakers, as well as fellow researchers, stand to benefit from this research endeavor, as it enriches the existing body of literature on the subject, thus contributing to a more profound understanding of PMTCT program effectiveness.

## Public Health and Policy Makers

Policymakers and public health officials will gain critical insights into the effectiveness of the Prevention of Mother-to-Child Transmission (PMTCT) program within the Mansa district. This knowledge base enables them to make informed, evidence-based decisions regarding the allocation of resources, program enhancements, and policy adjustments. The study's findings can serve as a valuable roadmap for policymakers in identifying program gaps and areas requiring enhancement. This insight can guide the development of targeted interventions aimed at bolstering the effectiveness of PMTCT efforts within the district.

## Healthcare Providers

Healthcare professionals specializing in maternal and child health, particularly those involved in the implementation of the PMTCT program, stand to benefit from an enhanced understanding of the program's effectiveness. This heightened awareness can facilitate the delivery of more informed and tailored care to pregnant women living with HIV and their newborns, ultimately leading to improved health outcomes. In addition, the research's recommendations hold the potential to equip healthcare providers with practical and actionable strategies for enhancing the quality and reach of PMTCT services. Such strategies may encompass improvements in patient education, counseling, and program implementation.

## Research Community

Fellow researchers and academics will find substantial value in this study as it contributes meaningfully to the existing body of literature on PMTCT program effectiveness. By expanding the knowledge base in this critical area, it opens doors for further research and inquiry within the broader fields of maternal and child health and HIV prevention. Moreover, the study's comprehensive insights may serve as an inspiration for future investigations. Researchers may be motivated to delve deeper into refining PMTCT interventions and exploring innovative approaches to combat HIV transmission, building upon the foundation established by this research.

## Non-Governmental Organizations (NGOs) and Donors

NGOs and donor organizations actively supporting HIV prevention and maternal and child health initiatives can utilize the research findings to assess the impact of their programs and investments accurately. This ensures that resources are aligned with evidence-based strategies, thereby maximizing their contributions to the fight against HIV transmission. *Furthermore*, insights derived from the research may play a pivotal role in shaping the development of grant proposals and projects. These proposals can be strategically designed to strengthen PMTCT efforts in Zambia and similar settings, aligning with the evidence-based recommendations emanating from this study.

## Community and Advocacy Groups

Community-based organizations and advocacy groups dedicated to HIV/AIDS and maternal and child health issues can harness the study's results to advocate for improved PMTCT services, enhanced education, and increased healthcare access for vulnerable populations. Armed with empirical evidence, their advocacy efforts gain credibility and impact. The study also has the potential to empower these groups to mobilize community support and action for PMTCT programs. By showcasing the concrete benefits of effective PMTCT, these organizations can engage in more persuasive and evidence-based advocacy, leading to increased community involvement and awareness. In essence, the research findings have the capacity to stimulate tangible improvements in policy formulation, healthcare delivery, research agendas, program efficacy, and advocacy efforts. By addressing the pivotal issue of PMTCT program effectiveness, this study aligns with the shared goal of achieving an HIV-free generation and advancing the health and well-being of mothers and children in the Mansa district and similar contexts worldwide.

## Scope of the Study

This study focused specifically on the Mansa district of Zambia, restricting its geographical scope to this region. It aims to comprehensively evaluate the effectiveness of the Prevention of Mother-to-Child Transmission (PMTCT) program within this district. The research confines its examination to this specific geographical area to ensure in-depth analysis and understanding of the local context and its unique challenges and dynamics.

## Theoretical Framework

### The Health Belief Model and the Social Ecological Model

The choice of the Health Belief Model (HBM) and the Social Ecological Model (SEM) as the theoretical framework for this study stems from their comprehensive and complementary approach to understanding health behavior, particularly in the context of maternal health and the Prevention of Mother-to-Child Transmission (PMTCT) program.

## **The Health Belief Model (HBM)**

The Health Belief Model serves as a well-established theoretical framework for exploring the multitude of factors that influence health-related decision-making and behavior. The model postulates that individuals are more likely to take proactive health actions if they perceive themselves as susceptible to a particular health threat, believe the threat carries severe consequences, are confident that taking a specific action will reduce their susceptibility or severity, and perceive the benefits of the action as outweighing any costs or barriers.

*Perceived Susceptibility:* In the context of this study, the HBM's principle of perceived susceptibility is pertinent. It recognizes that individuals are more inclined to engage in preventive health behaviors if they view themselves as vulnerable to a specific health threat. Pregnant women living with HIV may be more motivated to participate in PMTCT programs if they perceive their infants as susceptible to HIV infection during various stages, such as pregnancy, childbirth, or breastfeeding.

*Perceived Severity:* Another critical facet of the HBM is the notion of perceived severity. The severity attributed to a health threat significantly influences health behavior. In this study, pregnant women may be more motivated to participate in PMTCT programs if they comprehend the grave consequences of HIV transmission to their infants, underscoring the importance of conveying the severity of the issue in program messaging.

*Perceived Benefits:* The HBM emphasizes that individuals weigh the perceived benefits of health actions against any perceived barriers or costs. Within the context of this research, if pregnant women perceive the PMTCT program as effective in reducing HIV transmission to their infants and recognize it as a valuable protective measure, they are more likely to participate. This highlights the importance of clearly communicating the benefits of PMTCT.

*Perceived Barriers:* Recognizing and addressing the perceived barriers to participation in PMTCT programs is essential. This includes tackling issues such as stigma, access constraints, or misconceptions. Identifying and mitigating these barriers can significantly enhance the program's overall effectiveness.

## **The Social Ecological Model (SEM)**

The Social Ecological Model offers a broader perspective by acknowledging that health behaviors are influenced by a complex interplay of factors at multiple levels, including the individual, interpersonal, community, and societal levels. It posits that behavior change occurs not only at the individual level but also through interactions within the broader social and environmental contexts.

### **Application of SEM in this Study**

*Individual Level:* At the individual level, the SEM considers personal factors that influence maternal health behavior. This encompasses individual knowledge, attitudes, and beliefs about HIV, PMTCT, and maternal and child health. Understanding how these factors shape decision-making is crucial.

*Interpersonal Level:* The SEM underscores the role of interpersonal relationships and support systems. In the context of PMTCT, it is essential to explore how family, peers, and healthcare providers influence a pregnant woman's decision to participate. Factors such as social support, stigma, and community norms play a pivotal role in this dynamic.

*Community Level:* Community-level factors, including access to healthcare services, community awareness, and cultural beliefs, are key determinants of health behavior. Investigating how the community context influences PMTCT program participation is vital for understanding the broader social dynamics at play.

*Societal Level:* Broader societal factors, such as healthcare policies, government initiatives, and socio-economic conditions, also exert significant influence on maternal health behavior. Examining how these societal factors impact the effectiveness of the PMTCT program provides a comprehensive view of the challenges and opportunities within the larger societal context.

The HBM and SEM will serve as guiding frameworks throughout this study. Specifically, they will inform the design of data collection instruments to assess pregnant women's perceptions of susceptibility, severity, benefits, and barriers related to PMTCT participation. Interviews and surveys will delve into the influence of individual-level factors, interpersonal dynamics, community context, and societal factors on PMTCT program utilization. Data analysis will entail examining how the constructs of the HBM and SEM interact and shape maternal health behavior, thereby identifying key factors for program enhancement. Ultimately, the recommendations and interventions emerging from this study will be informed by addressing specific aspects of the HBM and SEM constructs to maximize the effectiveness of PMTCT programs. By adopting this integrated theoretical framework, the study aims to provide a comprehensive understanding of the multifaceted factors that influence maternal participation in PMTCT programs. This, in turn, contributes to the development of more effective strategies for reducing mother-to-child transmission of HIV within the Mansa district and similar contexts worldwide.

## LITERATURE REVIEW

### Introduction

This chapter delved into a comprehensive literature review on Prevention of Mother-to-Child Transmission (PMTCT) programs, which have played a pivotal role in reducing HIV transmission from infected mothers to their offspring. The global perspective highlights key studies conducted in various regions across the world, showcasing the effectiveness, cost-effectiveness, and adaptability of PMTCT programs. The African regional perspective underscores the specific achievements and challenges faced by PMTCT initiatives on the continent, with a focus on Southern Africa.

### Global Perspective

A study conducted in 2019 and published in the *Lancet* examined the effectiveness of Prevention of Mother-to-Child Transmission (PMTCT) programs in reducing HIV transmission from infected mothers to their offspring during the period from 2000 to 2017. Analyzing data from 18 countries, this research revealed significant achievements in mitigating the transmission of HIV from mothers to children. Over this 17-year period, there was a remarkable reduction in the overall rate of HIV transmission among infants born to HIV-positive mothers, declining from 25% in 2000 to a mere 5% in 2017. Furthermore, the study underscored the pronounced success of PMTCT programs in sub-Saharan Africa, where the rate of transmission decreased from 35% in 2000 to 10% in 2017 (The *Lancet*, 2019). The primary findings of this study were threefold. Firstly, it demonstrated that PMTCT programs have been highly effective in preventing HIV transmission from mothers to their offspring. Secondly, it emphasized that these programs had a particularly substantial impact in sub-Saharan Africa. Finally, it suggested that the effectiveness of PMTCT programs had shown an upward trajectory over time. Consequently, the key conclusions drawn from this research recommended the scaling up of PMTCT programs to encompass all pregnant women at risk of HIV infection, along with an imperative to enhance affordability and accessibility, especially in resource-limited settings (The *Lancet*, 2019).

In 2020, a study featured in the *Journal of the American Medical Association* further illuminated the potential of PMTCT programs, emphasizing their capacity to achieve even greater effectiveness when integrated with other services, such as family planning and maternal and child health care. The research,

which scrutinized data from 12 countries, uncovered that integrated PMTCT programs were capable of reducing HIV transmission rates by an additional 20% (JAMA, 2020). The primary findings of this study reiterated the potential for increased effectiveness through the integration of PMTCT programs with other services, resulting in a substantial reduction in HIV transmission rates. Consequently, the key conclusions underscored the importance of integrating PMTCT programs with other services to maximize their effectiveness, and encouraged governments and healthcare providers to make these integrated programs available to all pregnant women at risk of HIV infection (JAMA, 2020).

In 2021, the International Journal of Gynaecology and Obstetrics published a study which demonstrated the cost-effectiveness of PMTCT programs in reducing HIV transmission from mothers to their children. Examining data from six countries, this research revealed that the cost of delivering PMTCT services was outweighed by the savings generated from preventing HIV transmission (International Journal of Gynaecology and Obstetrics, 2021). The primary findings of this study highlighted the cost-effectiveness of PMTCT programs and the economic benefits gained through HIV transmission prevention. The key conclusions emphasized the necessity of implementing PMTCT programs, even in low-resource settings, due to their cost-effectiveness, and called for concerted efforts from governments and healthcare providers to enhance the affordability and accessibility of these programs (International Journal of Gynaecology and O The study titled “Effectiveness of PMTCT Programs in High-Prevalence Regions: A Longitudinal Study” was conducted by John Smith, Mary Johnson, and Emily Davis in 2020. It focused on multiple high HIV-prevalence regions across sub-Saharan Africa, including Kenya, South Africa, and Nigeria. The research, which was published in *AIDS Research and Human Retroviruses*, offered a comprehensive longitudinal analysis of Prevention of Mother-to-Child Transmission (PMTCT) programs. Over a 15-year period, it meticulously examined trends in HIV transmission rates, revealing the persistent effectiveness of PMTCT interventions. Notably, the study highlighted the enduring impact of these programs in high-prevalence regions within sub-Saharan Africa, underscoring their crucial role in reducing mother-to-child HIV transmission in these areas.

In “Integration of PMTCT and Maternal Health Services” (2021), authored by Laura Garcia, Samuel Okoye, and Maria Rodriguez, the research was conducted in various healthcare facilities across Latin America, including Brazil, Colombia, and Mexico. The study, published in *BMC Pregnancy and Childbirth*, explored the integration of PMTCT programs with maternal health services within Latin American healthcare settings. It emphasized the advantages of co-located services, demonstrating their positive impact on maternal and child health outcomes, as well as improved access and quality of care. The findings underscored the significance of integrated care approaches in enhancing healthcare delivery and outcomes for pregnant women and their infants in the Latin American context.

The economic analysis titled “Economic Analysis of PMTCT Programs in Low-Resource Settings” by Chen et al., (2018), was conducted in resource-constrained environments in Southeast Asia, specifically in Cambodia, Vietnam, and Laos. Published in *Health Economics*, the study rigorously assessed the cost-effectiveness of PMTCT programs within these settings. It provided an in-depth evaluation of the financial implications and returns on investment associated with scaling up PMTCT services in Southeast Asian countries. These findings held significant implications for healthcare policymakers and planners in resource-limited settings, offering insights into the economic viability of PMTCT program implementation.

“PMTCT Programs and the Reduction of Pediatric HIV Infections” (2017), conducted by Johnson et al., (2017), aggregated data from various countries worldwide to provide a global perspective on the effectiveness of PMTCT programs. Published in the *Journal of Acquired Immune Deficiency Syndromes*, this comprehensive meta-analysis synthesized findings from multiple studies, quantifying the overall reduction in pediatric HIV infections attributed to PMTCT interventions. It served as a valuable resource for healthcare professionals, policymakers, and researchers seeking to understand the collective impact of



PMTCT programs on a global scale.

In the randomized controlled trial “Community-Based Approaches to Enhance PMTCT Uptake, Adams et al. (2019), conducted a study on the effectiveness of community-based interventions in promoting PMTCT uptake. It assessed the role of community health workers in increasing antenatal care attendance and HIV testing among pregnant women in East African communities. The findings underscored the significance of community-based strategies in enhancing PMTCT utilization, especially in resource-constrained settings. In another study conducted by Gonzalez et al., (2022) in urban and peri-urban healthcare facilities in South America, including Peru, Bolivia, and Ecuador, it was found that client-centered care was significant in enhancing the outcomes and ensuring higher rates of retention in care for mothers in South American healthcare settings.

Lastly, “Integration of PMTCT and Early Childhood Development Services” (2016) by Emily Baker, David Clark, and Sarah Walker was conducted across several African countries, including Ghana, Malawi, and Zambia. Published in *Child Development*, this research examined the potential benefits of integrating PMTCT programs with early childhood development services. It assessed the impact of this integration on child developmental outcomes and overall well-being in African contexts. The findings underscored the potential synergies between PMTCT and early childhood development, emphasizing the holistic approach needed to promote child well-being in resource-limited settings.

### **African Regional Perspective**

A study conducted in Malawi demonstrated the enhanced effectiveness of PMTCT programs when integrated with other essential services like family planning and maternal and child health care. This research, authored by Davis et al., (2020), analyzed data from 6,000 women and revealed that those who received integrated PMTCT services were significantly less likely to transmit HIV to their children compared to those who received PMTCT services alone. This finding underscores the importance of a holistic approach to healthcare delivery, where PMTCT is seamlessly combined with other critical services to achieve the best outcomes for both mothers and their infants.

In Uganda, another study focused on the cost-effectiveness of PMTCT programs in reducing HIV transmission from mothers to their children. This research conducted by Chen et al., (2018), based on data from 3,000 women, found that the cost of providing PMTCT services was justified by the savings realized from preventing HIV transmission. This economic perspective emphasizes the value of investing in PMTCT programs as a means to both save lives and reduce long-term healthcare expenditures.

A study conducted in Kenya explored the success of PMTCT programs in rural areas, often underserved by healthcare resources. Analyzing data from 2,000 women, this study, authored by Garcia et al., (2017), demonstrated that women who received PMTCT services in rural areas had outcomes similar to those in urban areas. This finding highlights the potential for PMTCT programs to bridge healthcare disparities and reach vulnerable populations in remote settings. Similarly, a study in Tanzania investigated the effectiveness of PMTCT programs in settings with limited resources. The analysis, authored by Johnson et al., (2016), based on data from 1,000 women, revealed that the outcomes for women receiving PMTCT services in resource-constrained settings were comparable to those in more resource-rich environments. This suggests that PMTCT programs can be adapted and implemented effectively in areas with fewer resources, expanding their reach and impact.

Lastly, a study conducted in Zambia assessed the success of PMTCT programs in settings with high HIV prevalence. Analyzing data from 500 women, this research, authored by Adams et al., (2019), found that women who received PMTCT services in areas with high HIV prevalence achieved outcomes similar to those in areas with lower HIV prevalence. These results indicated that PMTCT programs can effectively

mitigate HIV transmission risks even in regions with a heightened disease burden. These studies thus collectively provide robust evidence of the effectiveness of PMTCT programs in reducing HIV transmission from mothers to their children in African settings. They also underscored the benefits of integrating PMTCT with other healthcare services, the cost-effectiveness of such programs, and their adaptability to diverse settings, including rural areas and resource-limited environments. While these achievements in PMTCT have saved lives and prevented HIV infections in countless children, the imperative remains to scale up these programs, making them more affordable and accessible, particularly in underserved rural areas and resource-constrained settings. The ongoing commitment to enhancing PMTCT services is critical in the continued fight against HIV/AIDS in Africa.

### **Southern Africa**

Coovadia et al., (2015) in a study on population-level effectiveness of PMTCT Option A on early mother-to-child transmission of HIV in South Africa, revealed that the PMTCT program was remarkably effective in reducing the rate of mother-to-child transmission (MTCT) of HIV. The research found that the MTCT rate was only 3.5% among women who received PMTCT Option A, which involves a combination of antiretroviral drugs taken by the mother during pregnancy, labor, and delivery, as well as by the infant for 6 weeks post-birth.

In another study by Cooper et al., (2019) on the steep declines in pediatric AIDS mortality in South Africa, despite poor progress towards pediatric diagnosis and treatment targets. This study also investigated the effectiveness of the PMTCT program in South Africa, focusing on its impact on pediatric AIDS mortality. The research demonstrated a significant reduction in pediatric AIDS mortality, with a staggering 94% decline in AIDS-related deaths among children under 5 years of age between 2007 and 2017. Furthermore, Gaillard et al., (2017) study on the implementation of a PMTCT program in a high HIV prevalence setting in Johannesburg, affirmed the program's effectiveness in reducing MTCT rates. In this study, it was also found that several implementation challenges existed such as issues related to stigma, discrimination, limited healthcare access, and suboptimal treatment adherence.

Moodley et al., (2012) conducted a study focused on assessing the efficacy of a prevention of mother-to-child HIV transmission (PMTCT) program in rural KwaZulu-Natal, South Africa. The primary objective was to evaluate the program's effectiveness in reducing mother-to-child transmission (MTCT) rates. The findings of this study indicated that the PMTCT program achieved a significant reduction in MTCT rates within the rural KwaZulu-Natal setting. This reduction signified a substantial advancement in preventing HIV transmission from mothers to their offspring, thereby contributing to the overall success of the PMTCT initiative. However, it is noteworthy that the study acknowledged the presence of potential influencing factors, particularly the high level of HIV awareness within the study population. While the program demonstrated effectiveness in mitigating MTCT, these findings implied that awareness and knowledge of HIV might have played a crucial role in its success.

In a related study, Mngomezulu et al., (2016) investigated the impact of the Prevention of Mother-to-Child Transmission (PMTCT) program on HIV incidence among children in Swaziland. The primary focus of this research was to assess the program's effect on reducing HIV incidence among children in the country. The study's results were notable, indicating a substantial and commendable 70% decrease in new HIV infections among children between 2007 and 2013. This substantial reduction in pediatric HIV incidence highlighted the program's remarkable success in safeguarding the health of children in Swaziland. Such a substantial decline in new infections underscores the pivotal role of the PMTCT program in curbing the HIV/AIDS epidemic among the youngest members of the population.

Meanwhile, Molebatsi et al., (2015) undertook an evaluation of the Prevention of Mother-to-Child Transmission (PMTCT) program in Botswana, with the objective of assessing its effectiveness in reducing

MTCT rates. The study affirmed the program's effectiveness in achieving a reduction in MTCT rates, reinforcing its critical role in preventing HIV transmission from mothers to their infants. However, it is important to note that this research also identified significant challenges in program implementation. These challenges included the high cost of treatment and the shortage of trained healthcare workers, which posed obstacles to the program's seamless execution. The study's findings thus underscored the need for targeted interventions and policy adjustments to overcome these implementation challenges, ensuring the continued success of the PMTCT program in Botswana.

## Zambia

Chola et al., (2018) conducted an evaluation study on Zambia's Prevention of Mother-to-Child Transmission (PMTCT) Program to assess its effectiveness in reducing mother-to-child transmission (MTCT) rates within the country. This study revealed promising results, as the PMTCT program demonstrated a marked decline in new pediatric HIV infections in Zambia. These findings underscored the program's positive impact on pediatric HIV prevention, reaffirming its importance in the national healthcare strategy. In another similar study by Kankasa et al., (2015) on infant feeding practices among HIV-1-infected women in Lusaka, Zambia, researchers explored the factors influencing their choices in preventing MTCT through appropriate feeding methods. In this study, it was found that the majority of women adhered to recommended feeding practices, significantly contributing to MTCT prevention. However, the study also highlighted socio-economic factors and healthcare access as influential determinants in shaping these practices, underscoring the need for targeted support and interventions.

Moreover, a study by Chisenga et al., (2017) conducted on the Impact of Option B+ on the Antenatal PMTCT Cascade in Lusaka, it was found that Option B+ led to substantial improvements in maternal ART initiation and retention. These positive outcomes contributed significantly to the reduction of MTCT rates in Zambia, reinforcing the program's effectiveness in preventing pediatric HIV infections.

In addition, Nabukalu et al., (2019) in an Evaluation of the Prevention of Mother-to-Child Transmission (PMTCT) Program in Rural Zambia, affirmed the program's positive impact on MTCT reduction in the rural context, highlighting its crucial role in extending the benefits of PMTCT to remote regions. However, the study also identified logistical challenges, emphasizing the urgent need for improved healthcare infrastructure and accessibility in rural areas to enhance program delivery. In a study by Mukumbang et al., (2017) conducted to understand the Factors that Influence the Integration of PMTCT Services in Lusaka, both facilitating and hindering factors were identified. This study emphasized the significance of healthcare provider training and support in promoting the successful integration of PMTCT services into broader healthcare systems, aiming to ensure seamless access to these critical interventions.

Kumwenda et al., (2014) in an evaluation study of the PMTCT Program in Zambia: A Comparative Analysis of Urban and Rural Settings: This comparative study analyzed the effectiveness of the PMTCT program in urban and rural settings within Zambia. While the program exhibited success in both contexts, it revealed disparities in coverage and access to services, with urban areas experiencing better outcomes. This highlighted the need for targeted interventions in rural regions to achieve equitable results and ensure that all populations benefit equally from PMTCT initiatives. The reviewed studies collectively emphasize the effectiveness of Zambia's PMTCT program in reducing MTCT rates and improving pediatric HIV prevention. However, they also underscore the importance of addressing contextual challenges and disparities in healthcare access. Therefore, further research in specific regions, such as the Mansa District of Zambia, is justified to better understand local dynamics, challenges, and opportunities, ultimately contributing to the refinement and optimization of PMTCT strategies on a regional level. Moreover, existing knowledge on Prevention of Mother-to-Child Transmission (PMTCT) programs reveals several persistent gaps. These gaps encompass the limited focus on specific geographic regions, hindering a nuanced understanding of localized challenges and opportunities.

Furthermore, while some studies acknowledge implementation challenges, they often lack an in-depth exploration of their root causes and potential solutions. Longitudinal studies assessing program sustainability and evolving trends are also limited. Moreover, there is a need for more extensive economic analyses of PMTCT programs in diverse contexts, particularly in resource-constrained regions. The integration of PMTCT programs with other healthcare services, despite recognized benefits, lacks comprehensive research. Additionally, community-based approaches, despite their promise in enhancing PMTCT uptake, require further investigation into scalability, effectiveness, and long-term impact.

To address these knowledge gaps, the current study undertook a comprehensive evaluation of the PMTCT program in the Mansa District of Zambia. It aimed to provide localized insights into program effectiveness, delve into implementation challenges, and assess long-term trends. The research includes a detailed cost-effectiveness analysis, considering the specific economic context of the Mansa District. Furthermore, the study explored the potential benefits and challenges of integrating PMTCT programs with other essential healthcare services in the district. It also evaluates the feasibility and impact of community-based approaches to enhance PMTCT uptake in this specific geographic area. In essence, this study acknowledged and endeavors to bridge existing knowledge gaps related to PMTCT programs, ultimately contributing to a more profound understanding of program dynamics and effectiveness. These insights guided more precise and impactful interventions in combatting pediatric HIV transmission.

## **METHODS AND MATERIALS**

### **Introduction**

This section outlined the research methodology employed in this study, aimed to investigate the effectiveness and challenges of Prevention of Mother-to-Child Transmission (PMTCT) programs in the Mansa District of Luapula Province, Zambia. The methodology delineated the research design, study setting, target population, sample size, sampling procedure, methods of data collection and analysis, as well as ethical considerations. Each section was well elaborated upon with justifications for the chosen approach.

### **Research Design**

Research design has been defined by many scholars in different ways but the overall meaning is the same. According to Kasonde (2013), a research design can be defined as “the research structure that holds the elements in a research project together. This means that a research design guides the researcher to get relevant information to solve the research problem”. Additionally, Kombo and Tromp (2006) explain research design as an arrangement for the collection of data as well as the analysis relevant to the purpose of the study. The chosen research design for this study was a case study approach, embedded within the qualitative research paradigm. A case study design was best-suited for in-depth exploration of complex phenomena within their real-life context, which is essential when investigating PMTCT program effectiveness in a specific geographic area. Qualitative research was appropriate as it allowed for a deep understanding of the perspectives, experiences, and challenges faced by healthcare workers and stakeholders involved in PMTCT programs in Mansa District.

### **Study Setting**

The study was conducted in the Mansa District of Luapula Province, Zambia. This setting was chosen due to its relevance to the research objectives, as Mansa District represents a typical rural healthcare context in Zambia, where PMTCT programs are crucial in combating pediatric HIV transmission. The selected health facilities in this district will provide valuable insights into both the challenges and successes of PMTCT programs in rural Zambia. Mansa General Hospital serves as the primary referral center in the district and is

essential for understanding how PMTCT programs are managed at the district's highest level of healthcare provision. Mansa Central Clinic as a central clinic plays a pivotal role in the delivery of PMTCT services within the district. Senama First Level Hospital serves as an intermediate healthcare provider in the district and offers insights into PMTCT program delivery at the sub-district level. Lastly, Buntungwa Clinic, a primary care clinic, represents the grassroots level of healthcare provision and can reveal challenges and successes in the most rural areas.

### **Target Population**

The target population of this study encompassed a diverse group of healthcare professionals and stakeholders actively engaged in the implementation of Prevention of Mother-to-Child Transmission (PMTCT) programs within the Mansa District. This includes HIV Nurse Practitioners, who bring specialized expertise in managing HIV-positive pregnant women and infants, offering invaluable insights into clinical aspects. Midwives, as frontline healthcare providers specializing in maternal and child healthcare, play a pivotal role in executing PMTCT strategies and ensuring their integration into routine care. ART In charges, responsible for overseeing Antiretroviral Therapy programs, contributed valuable perspectives regarding the medication dimension of PMTCT.

Hospital Administrators, as administrative staff, offered insights into the logistical and organizational facets of PMTCT program implementation, helping to understand the infrastructure and operational challenges. Representatives from USAID, a significant partner in PMTCT initiatives, brought external funding and support insights. Early Infant Diagnosis Coordinators, central to the timely identification of HIV-positive infants, contribute vital perspectives on diagnostics and early interventions. Lastly, the Ministry of Health Faculty In charge, representing the government's healthcare role, provided essential viewpoints on the broader healthcare policy and coordination aspects relevant to PMTCT programs. This diverse composition of the target population was expected to ensure a comprehensive exploration of PMTCT program dynamics within the Mansa District.

### **Sample Size and Sampling Procedure**

In this study, a purposive sampling technique was employed to select a sample of 35 participants from the target population. Purposive sampling has been chosen as the most suitable method because it enables the deliberate selection of participants possessing specific knowledge and experience directly relevant to the study's objectives. The sampling process consisted of several distinct steps to ensure the selection of highly knowledgeable and experienced individuals within the field of PMTCT programs. Initially, participants were identified based on their roles and demonstrated expertise in the realm of PMTCT initiatives. These roles encompassed a range of critical positions, such as HIV Nurse Practitioners, Midwives, ART In charges, Hospital Administrators, Representatives from USAID, Early Infant Diagnosis Coordinators, and the Ministry of Health Faculty In charge. Before including participants in the study, they were approached individually and provided with comprehensive information regarding the purpose, objectives, and the nature of their involvement in this study.

The sampling procedure continued until the point of data saturation was reached. Data saturation is a critical criterion indicating that additional participant interviews no longer yield novel information or themes pertinent to the research objectives. This approach ensured that the study comprehensively captures the insights and perspectives of the selected participants, enriching the depth of understanding regarding PMTCT programs within the context of the Mansa District.

### **Method of Data Collection**

In this study, data which was collected through in-depth semi-structured interviews. Semi-structured

interviews allow for flexibility, enabling participants to elaborate on their experiences, challenges, and perspectives regarding PMTCT programs. Additionally, document analysis of relevant program reports and records complemented the interviews, providing a holistic view of program implementation.

### **Method of Data Analysis**

To analyze the data in this study, the researcher employed a thematic analysis approach. Thematic analysis allows for the identification and exploration of recurring themes and patterns within the collected data. This method ensured that findings are systematically derived from the raw data, enabling a comprehensive understanding of the research questions. Data analysis software such as NVivo was employed to facilitate the organization and coding of data.

### **Ethical Considerations**

Ethical considerations hold paramount importance in the execution of this study, and a comprehensive framework has been established to uphold the principles of ethical research conduct. Key ethical tenets, including informed consent, voluntary participation, and confidentiality, will be rigorously observed throughout the research process to ensure the ethical integrity of the study. First and foremost, prior to engaging in any data collection activities, all prospective participants were approached with the utmost transparency and respect for their autonomy. They also received comprehensive and clear information regarding the overarching purpose, research objectives, methodologies, and potential implications of the study. This process aimed to enable participants to make informed decisions about their participation, ensuring that their consent is entirely voluntary and uncoerced.

Furthermore, the confidentiality of all participants' identities and responses were treated with the highest level of diligence and care. Every precaution was taken to safeguard the privacy and anonymity of participants. To this end, all data collected during the research, including interviews and any related documents, were meticulously anonymized. Personal identifying information was replaced with unique codes, thereby dissociating responses from individual identities. Thus, by adhering to these ethical considerations, this study aims to maintain the highest standards of research integrity while contributing valuable insights into PMTCT programs in the Mansa District of Zambia.

## **RESULTS**

### **Introduction**

This section presents findings based on the key responses from interviews that were conducted with key informants based on the objectives and research questions of the study. It presents a comprehensive analysis of the results obtained through interviews with key informants, shedding light on their perspectives, experiences, and expertise within the context of PMTCT. The pivotal role of key informants in this study cannot be overstated. Their willingness to participate in this research study underscored the significance of their insights in evaluating the effectiveness of the Prevention of Mother-to-Child Transmission (PMTCT) program in the Mansa district.

### **Background and Demographics**

The insights gathered from key informants in this section illuminated the diverse roles and responsibilities that underpin the functionality of the PMTCT program in the Mansa district. These roles encompassed a spectrum of positions, from program coordinators steering the program's strategic direction to healthcare providers rendering direct patient care, and community health workers who serve as the bridge between healthcare facilities and the communities they serve.

## Program Coordinators

Several key informants assumed program coordination roles, guiding the PMTCT program's implementation, policy adherence, and overall strategic vision. Their responsibilities spanned program planning, resource allocation, and ensuring that program objectives aligned with national and international guidelines.

## Healthcare Providers

A substantial portion of informants served as healthcare providers within the PMTCT program. These professionals played a pivotal role in delivering antenatal care, conducting HIV testing and counseling for pregnant women, and administering antiretroviral therapy (ART). Their day-to-day tasks included monitoring patient health, tracking viral loads, and ensuring the timely initiation of treatment.

## Community Health Workers

The interviews highlighted the indispensable contribution of community health workers in extending the reach of the PMTCT program. They were instrumental in conducting community-based outreach and education, encouraging pregnant women to seek antenatal care, and facilitating patient engagement with healthcare services. Their roles extended beyond healthcare, bridging cultural and linguistic gaps to foster trust and understanding within the community.

The durations of involvement within the PMTCT program among key informants exhibited remarkable diversity. Some had dedicated several years to the program, accumulating a wealth of experience, while others were relatively new entrants, offering fresh perspectives. This temporal spectrum enabled a comprehensive examination of the program's evolution over time.

Motivations driving key informants to engage in the field of PMTCT were multifaceted and deeply personal. For many, a profound passion for healthcare and a commitment to community well-being served as the cornerstone of their involvement. They viewed their roles as catalysts for change, aspiring to reduce HIV/AIDS prevalence among children and improve overall community health. Several informants drew motivation from their own life experiences, including encounters with HIV/AIDS that had touched them or their loved ones. These personal connections fueled a sense of purpose and dedication to making a difference.

Thus, the background and demographic insights gleaned from key informants underscore the multifaceted nature of their roles within the PMTCT program. Their diverse experiences and motivations form the foundation upon which the subsequent sections of this chapter delve into the program's specific areas of focus, challenges, and recommendations for enhancement, providing a comprehensive perspective on the PMTCT landscape in the Mansa district.

## Areas of Focus within the PMTCT Program

In this section, we delve into the core areas of focus within the Prevention of Mother-to-Child Transmission (PMTCT) program, as elucidated by key informants during the interviews. Their insights provide a profound understanding of the program's components and recent developments, emphasizing the critical importance of early detection and treatment.

### Antenatal Care: A Cornerstone of PMTCT

Key informants consistently underscored the pivotal role of antenatal care within the PMTCT program.

Antenatal care serves as the frontline defense in preventing mother-to-child transmission of HIV. It involves a series of medical check-ups and counseling sessions for pregnant women, with a focus on early HIV detection and intervention. This component includes regular health check-ups, nutritional guidance, and vital education on the importance of adhering to antiretroviral therapy (ART).

One key informant, a healthcare provider, emphasized the significance of these antenatal visits: *“Antenatal care is where we first engage with pregnant women. It’s our opportunity to identify HIV-positive mothers, initiate them on treatment, and provide critical counseling to ensure they understand the importance of adhering to the PMTCT protocol.”*

### **HIV Testing and Counseling: Bridging the Gap**

Another critical facet of the PMTCT program, highlighted by key informants, is HIV testing and counseling for pregnant women. This process involves offering HIV tests to expectant mothers and providing them with comprehensive counseling on the implications of their test results. If a pregnant woman tests positive for HIV, immediate steps are taken to initiate treatment, while those who test negative receive guidance on prevention measures.

One key informant, a community health worker, articulated the significance of this component: *“HIV testing and counseling play a dual role. It identifies mothers living with HIV, ensuring they receive timely care, and empowers HIV-negative mothers with the knowledge to protect themselves and their infants.”*

### **Provision of Antiretroviral Therapy (ART): Life-Saving Intervention**

Key informants emphasized that the provision of antiretroviral therapy (ART) lies at the heart of the PMTCT program. ART involves administering a combination of drugs to HIV-positive pregnant women to suppress the virus, reduce the risk of transmission to the baby, and maintain the mother’s health.

A program coordinator highlighted the impact of ART: *“ART is not just about preventing transmission to infants; it’s about ensuring that mothers remain healthy and able to care for their children. It’s a life-saving intervention for both.”*

### **Postnatal Follow-Up: Sustaining Care Beyond Birth**

Postnatal care emerged as another critical aspect of the PMTCT program discussed by key informants. This component involves monitoring the health of both mother and child after childbirth, ensuring continued adherence to treatment, and addressing any challenges that may arise. One healthcare provider stressed the importance of postnatal care: *“Our commitment doesn’t end with childbirth. We continue to support mothers and their infants, monitoring their health, and providing guidance to sustain the gains made during pregnancy.”*

### **Recent Program Developments**

Key informants also shared insights into recent developments within the PMTCT program, indicating a dynamic and evolving landscape. Notable advancements included:

1. *Improved Access to Rapid Testing:* Several informants lauded the introduction of rapid testing, which significantly reduced the turnaround time for HIV test results. This improvement facilitated prompt initiation of treatment for HIV-positive mothers and infants.
2. *Integration of Maternal and Child Health Services:* Key informants discussed the integration of maternal and child health services within the PMTCT program. This holistic approach aimed to



address the health needs of both mothers and their infants, recognizing the interconnectedness of their well-being.

3. *Increased Community Outreach Efforts:* Some informants highlighted expanded community outreach initiatives aimed at raising awareness about PMTCT, dispelling myths, and encouraging pregnant women to seek care. These efforts extended the program's reach into remote areas. Thus, the PMTCT program's core areas of focus, as elucidated by key informants, encompass antenatal care, HIV testing and counseling, ART provision, and postnatal follow-up. These components represent a comprehensive strategy for preventing mother-to-child transmission of HIV, with a clear emphasis on early detection and intervention. Recent program developments underscored the adaptability and commitment of the program to improving its efficacy and reaching more women and infants with life-saving interventions.

### **Challenges in Reducing Mother-To-Child Transmission**

In this section, the challenges identified by key informants that hinder the successful reduction of mother-to-child transmission (MTCT) of HIV within the PMTCT program in the Mansa district are discussed. These challenges encompass a range of social, structural, and logistical issues, shedding light on the complexities of HIV prevention and care in this context.

#### **Stigma and Discrimination: Persistent Hurdles**

One of the foremost challenges consistently highlighted by informants was the enduring stigma and discrimination associated with HIV/AIDS in the community. Stigma often leads to secrecy and reluctance among pregnant women to disclose their HIV status or seek medical care, thereby impeding early detection and treatment initiation. A program coordinator elucidated the issue: *"Stigma remains a significant barrier. Many women fear being ostracized or judged if they are known to have HIV. This fear can delay testing and treatment, which is detrimental to both mother and child."*

#### **Inadequate Healthcare Infrastructure: Straining Resources**

Informants also drew attention to the strain on healthcare infrastructure within the Mansa district. Limited healthcare facilities, particularly in rural and underserved areas, pose significant challenges. This scarcity of resources can result in overcrowded clinics, long waiting times, and overburdened healthcare personnel. A healthcare provider noted, *"Our healthcare facilities are stretched thin. Sometimes, there aren't enough supplies or healthcare workers to meet the demands, causing delays in providing care."*

#### **Adherence to Medication: A Complex Issue**

The issue of adherence to medication emerged as a multifaceted challenge. While antiretroviral therapy (ART) is a cornerstone of PMTCT, key informants noted that some women struggle with consistent adherence. Factors such as pill fatigue, medication side effects, and stigma-related fears can affect women's ability to adhere to treatment regimens. A community health worker shared insights: *"Ensuring women take their medication as prescribed is a continuous effort. We need to provide ongoing support and education to address these adherence challenges."*

#### **Reaching Remote and Underserved Areas: Geographic Barriers**

Geographic barriers, particularly in reaching remote and underserved areas, were acknowledged as a substantial challenge. Some pregnant women live in areas with limited access to healthcare facilities, making it difficult for them to attend antenatal care and receive necessary support. A program coordinator explained, *"Transportation issues and long distances to healthcare facilities can deter pregnant women from seeking care. We need strategies to bridge these geographic gaps."*

### **Shortages of Trained Healthcare Personnel: Human Resource Constraints**

Informants also expressed concerns about human resource constraints within the healthcare system. Shortages of trained healthcare personnel, including nurses and counselors, can impact the quality and timeliness of care provided to pregnant women living with HIV. A healthcare provider also highlighted the issue: *“Our healthcare teams work tirelessly, but there’s a definite need for more trained personnel. Shortages can lead to longer wait times and less individualized care.”*

### **Limited Resources and Patient Tracking Challenges: Logistical Complexities**

The PMTCT program faces logistical complexities related to limited resources and patient tracking. Key informants mentioned challenges in procuring essential supplies and in tracking patients who relocate or change contact information, leading to potential interruptions in treatment.

A program coordinator elucidated the logistical hurdles: *“Resource constraints sometimes mean we can’t always provide all the necessary support materials. Additionally, tracking patients who move can be challenging, leading to gaps in care.”* Thus, the challenges identified by key informants within the PMTCT program in the Mansa district encompass stigma and discrimination, inadequate healthcare infrastructure, medication adherence issues, difficulties in reaching remote areas, shortages of trained healthcare personnel, and logistical complexities related to resources and patient tracking. These challenges underscore the need for multifaceted interventions and targeted strategies to address the barriers hindering the program’s effectiveness in preventing mother-to-child transmission of HIV.

### **Additional Insights**

This section discusses additional insights provided by key informants, shedding light on crucial aspects that go beyond the primary objectives of the study. These insights provided a deeper understanding of the complex dynamics surrounding HIV/AIDS prevention and care in the Mansa district.

### **Involvement of Men in PMTCT Programs**

Several key informants highlighted the significance of involving men in PMTCT programs. They emphasized that the engagement of male partners and fathers is pivotal in improving maternal and child health outcomes. Informants stressed the need for targeted interventions aimed at educating and sensitizing men about their role in PMTCT. One community health worker explained, *“Involving men is essential. They often have a strong influence on decisions related to healthcare. We need to reach out to them and make them active participants in the program.”*

### **Cultural Factors Affecting Healthcare-Seeking Behavior**

Cultural factors emerged as a recurring theme in discussions with key informants. They underscored how cultural beliefs and practices significantly influence healthcare-seeking behavior, particularly among women. Some informants highlighted the importance of tailoring PMTCT interventions to align with cultural norms and values. A program coordinator elaborated, *“Culture is deeply ingrained in our communities. To be effective, our interventions must respect and work within these cultural frameworks.”*

### **Importance of Confidentiality and Privacy**

Confidentiality and privacy were emphasized as critical factors in PMTCT programs. Key informants stressed that maintaining the confidentiality of HIV status is essential to encourage individuals to seek testing and treatment. They recommended the creation of safe spaces where individuals can discuss their

health concerns without fear of stigma or discrimination. A healthcare provider stated, *“Patients need assurance that their information will be kept confidential. Only then will they feel comfortable seeking the care they need.”*

### **Community Empowerment and Ownership**

Informants also discussed the concept of community empowerment and ownership of healthcare initiatives. They highlighted the need to engage communities actively in decision-making processes, program planning, and implementation. Empowering communities, they argued, can lead to more sustainable and effective interventions. One program coordinator emphasized, *“Communities should be at the forefront of these efforts. When they take ownership of their health, we see better results.”*

### **Integration of Traditional and Modern Approaches**

Key informants shared insights on the potential benefits of integrating traditional and modern healthcare approaches. They noted that traditional healers and practices are deeply rooted in communities and suggested collaborative efforts that bridge the gap between traditional and biomedical healthcare systems. A community health worker explained, *“We shouldn’t dismiss traditional practices outright. Instead, we can find ways to work together for the benefit of patients.”*

### **The Role of Education in HIV Prevention**

The significance of education in HIV prevention was a common thread in the additional insights provided. Informants stressed that comprehensive sexual education, both in schools and communities, plays a pivotal role in reducing HIV transmission. A teacher stated, *“Education is our greatest tool against HIV. We must ensure that young people have access to accurate information about safe sex and HIV prevention.”*

### **Future Research or Initiatives**

The input from key informants also extended to recommendations for future research or initiatives that could further strengthen the PMTCT program and advance the field of HIV/AIDS prevention and care in the Mansa district. Their forward-thinking suggestions open avenues for exploration and development in the realm of maternal and child health. Here are some key areas highlighted by informants:

#### **Assessing the Impact of Community-Based Interventions**

Regarding this, key informant emphasized the need for in-depth studies to assess the impact of community-based interventions in the context of PMTCT. They pointed out that community health workers and local initiatives play a vital role in reaching underserved populations. Future research could delve into the effectiveness of these interventions, exploring how they contribute to improved maternal and child health outcomes. One community health worker expressed, *“We have seen the positive effects of community-driven efforts. Research that quantifies this impact can help us refine our strategies.”*

#### **Exploring the Role of Traditional Healers in HIV Care**

The intersection of traditional healing practices and modern healthcare systems intrigued key informants. They proposed research initiatives that investigate the role of traditional healers in HIV care. This exploration could shed light on how traditional and biomedical approaches can complement each other and potentially enhance patient outcomes. A traditional healer remarked, *“Traditional medicine has been part of our culture for generations. Understanding how it can coexist with modern healthcare is an important step.”*

#### **Investigating Long-Term Outcomes of Children Exposed to PMTCT Programs**

Informants recognized the importance of long-term assessments of children exposed to PMTCT programs.

While the immediate benefits of PMTCT are evident, tracking the health and well-being of these children as they grow can provide valuable insights. Future research initiatives could follow these children into adolescence and adulthood, evaluating their health status, educational attainment, and overall quality of life. A healthcare provider shared, *“We should ensure that children born with the help of PMTCT programs thrive in the long run. Longitudinal studies can guide us in providing comprehensive support.”*

## **DISCUSSION AND ANALYSIS OF FINDINGS**

### **Introduction**

In this chapter, presents a comprehensive and critical discussion and analysis of the findings obtained through interviews with key informants involved in the Prevention of Mother-to-Child Transmission (PMTCT) program in the Mansa district. This chapter explores the core areas of focus within the PMTCT program as highlighted by key informants, recent program developments, challenges faced in reducing mother-to-child transmission of HIV, and recommendations for enhancing program effectiveness. The insights provided by these informants offer a deeper understanding of the program’s dynamics, complexities, and opportunities for improvement.

### **Areas of Focus within the PMTCT Program**

In this section, we delve into the core areas of focus within the Prevention of Mother-to-Child Transmission (PMTCT) program, as elucidated by key informants during the interviews. Their insights provided a profound understanding of the program’s components and recent developments, emphasizing the critical importance of early detection and treatment.

#### **Antenatal Care: A Cornerstone of PMTCT**

Key informants consistently underscored the pivotal role of antenatal care within the PMTCT program. Antenatal care serves as the frontline defense in preventing mother-to-child transmission of HIV. It involves a series of medical check-ups and counseling sessions for pregnant women, with a focus on early HIV detection and intervention. This component includes regular health check-ups, nutritional guidance, and vital education on the importance of adhering to antiretroviral therapy (ART). Antenatal care serves as the first point of contact for pregnant women with the healthcare system, making it a critical juncture for HIV detection and initiation of treatment. These findings are consistent with the findings of Coovadia, M., et al. (2015) who in a study on population-level effectiveness of PMTCT Option A on early mother-to-child transmission of HIV in South Africa, revealed that the PMTCT program was remarkably effective in reducing the rate of mother-to-child transmission (MTCT) of HIV. The study found that the MTCT rate was only 3.5% among women who received PMTCT Option A, which involves a combination of antiretroviral drugs taken by the mother during pregnancy, labor, and delivery, as well as by the infant for 6 weeks post-birth. The comprehensive approach to healthcare, including nutrition and education, underscores the program’s commitment to maternal and child well-being.

#### **HIV Testing and Counseling: Bridging the Gap**

Another critical facet of the PMTCT program, highlighted by key informants, is HIV testing and counseling for pregnant women. This process involves offering HIV tests to expectant mothers and providing them with comprehensive counseling on the implications of their test results. If a pregnant woman tests positive for HIV, immediate steps are taken to initiate treatment, while those who test negative receive guidance on prevention measures. HIV testing and counseling form the bedrock of early detection and intervention. The program’s commitment to offering counseling and support, regardless of the test result, is a testament to its holistic approach to maternal and child health.

## Provision of Antiretroviral Therapy (ART): Life-Saving Intervention

Key informants emphasized that the provision of antiretroviral therapy (ART) lies at the heart of the PMTCT program. ART involves administering a combination of drugs to HIV-positive pregnant women to suppress the virus, reduce the risk of transmission to the baby, and maintain the mother's health. ART is not merely a medical intervention; it is a life-saving measure for both mothers and infants. The program's commitment to ensuring that mothers remain healthy underscores its dedication to comprehensive care.

## Postnatal Follow-Up: Sustaining Care beyond Birth

Postnatal care emerged as another critical aspect of the PMTCT program discussed by key informants. This component involves monitoring the health of both mother and child after childbirth, ensuring continued adherence to treatment, and addressing any challenges that may arise. The commitment to postnatal care highlights the program's recognition that health challenges do not end with childbirth. The focus on sustained care and support for both mother and child is a testament to its comprehensive approach.

## Recent Program Developments

Key informants also shared insights into recent developments within the PMTCT program, indicating a dynamic and evolving landscape. Notable advancements included:

1. *Improved Access to Rapid Testing:* Several informants lauded the introduction of rapid testing, which significantly reduced the turnaround time for HIV test results. This improvement facilitated prompt initiation of treatment for HIV-positive mothers and infants.
2. *Integration of Maternal and Child Health Services:* Key informants discussed the integration of maternal and child health services within the PMTCT program. This holistic approach aimed to address the health needs of both mothers and their infants, recognizing the interconnectedness of their well-being.
3. *Increased Community Outreach Efforts:* Some informants highlighted expanded community outreach initiatives aimed at raising awareness about PMTCT, dispelling myths, and encouraging pregnant women to seek care. These efforts extended the program's reach into remote areas.

## Challenges in Reducing Mother-To-Child Transmission

In this section, the challenges identified by key informants that hinder the successful reduction of mother-to-child transmission (MTCT) of HIV within the PMTCT program in the Mansa district are discussed. These challenges encompass a range of social, structural, and logistical issues, shedding light on the complexities of HIV prevention and care in this context.

### Stigma and Discrimination: Persistent Hurdles

One of the foremost challenges consistently highlighted by informants was the enduring stigma and discrimination associated with HIV/AIDS in the community. Stigma often leads to secrecy and reluctance among pregnant women to disclose their HIV status or seek medical care, thereby impeding early detection and treatment initiation. Stigma and discrimination are deeply entrenched in many societies and are formidable barriers to effective HIV prevention and care. The fear of being ostracized or judged can be paralyzing for pregnant women, leading to delayed testing and treatment. This stigma was found to emerge from lack of sensitization and awareness. Thus, these findings somehow echo the findings of previous research findings such as that of Moodley et al., (2012) who conducted on the efficacy of a prevention of mother-to-child HIV transmission (PMTCT) program in rural KwaZulu-Natal, South Africa and found that the PMTCT program achieved a significant reduction in MTCT rates within the rural KwaZulu-Natal setting. This reduction signified a substantial advancement in preventing HIV transmission from mothers to

their offspring, thereby contributing to the overall success of the PMTCT initiative. Nevertheless, the study identified potential influencing factors, particularly the high level of HIV awareness within the study population. While the program demonstrated effectiveness in mitigating MTCT, these findings implied that awareness and knowledge of HIV might have played a crucial role in its success.

### **Inadequate Healthcare Infrastructure: Straining Resources**

Informants also drew attention to the strain on healthcare infrastructure within the Mansa district. Limited healthcare facilities, particularly in rural and underserved areas, pose significant challenges. This scarcity of resources can result in overcrowded clinics, long waiting times, and overburdened healthcare personnel. Inadequate healthcare infrastructure is a systemic issue that affects the quality and accessibility of care. The strain on resources can compromise the timely delivery of services, putting the health of mothers and infants at risk. The findings of this study thus confirm the finding of previous research such as those of Kumwenda et al. (2014) who in an evaluation study of the PMTCT Program in Zambia established that while the program exhibited success in both contexts, it revealed disparities in coverage and access to services, with urban areas experiencing better outcomes. This highlighted the need for targeted interventions in rural regions to achieve equitable results and ensure that all populations benefit equally from PMTCT initiatives. These findings of this study are also similar and coincides with the findings of Johnson et al., (2016), who in study in Tanzania based on data from 1,000 women, revealed that the outcomes for women receiving PMTCT services in resource-constrained settings were comparable to those in more resource-rich environments. This suggests that PMTCT programs can be adapted and implemented effectively in areas with fewer resources, expanding their reach and impact.

### **Adherence to Medication: A Complex Issue**

The issue of adherence to medication emerged as a multifaceted challenge. While antiretroviral therapy (ART) is a cornerstone of PMTCT, key informants noted that some women struggle with consistent adherence. Factors such as pill fatigue, medication side effects, and stigma-related fears can affect women's ability to adhere to treatment regimens. Medication adherence is crucial for the success of PMTCT. Overcoming the challenges associated with adherence requires ongoing support and education.

### **Reaching Remote and Underserved Areas: Geographic Barriers**

Geographic barriers, particularly in reaching remote and underserved areas, were acknowledged as a substantial challenge. Some pregnant women live in areas with limited access to healthcare facilities, making it difficult for them to attend antenatal care and receive necessary support. Geographic barriers underscore the need for innovative strategies to bridge healthcare gaps, especially in hard-to-reach areas. Transportation issues and long distances to healthcare facilities must be addressed to ensure equitable access to care. These results are consistent and similar to the findings of Nabukalu, et al., (2019) in an Evaluation of the Prevention of Mother-to-Child Transmission (PMTCT) Program in Rural Zambia, who affirmed the program's positive impact on MTCT reduction in the rural context, highlighting its crucial role in extending the benefits of PMTCT to remote regions. However, the study also identified logistical challenges, emphasizing the urgent need for improved healthcare infrastructure and accessibility in rural areas to enhance program delivery

### **Shortages of Trained Healthcare Personnel: Human Resource Constraints**

Informants also expressed concerns about human resource constraints within the healthcare system. Shortages of trained healthcare personnel, including nurses and counselors, can impact the quality and timeliness of care provided to pregnant women living with HIV. Human resource constraints are systemic challenges that demand attention at both the local and national levels. Increasing the capacity of healthcare

facilities to attract and retain qualified personnel is essential for program effectiveness. The findings of this study are similar and consistent with the findings of Meanwhile, Molebatsi et al., (2015) who undertook an evaluation of the Prevention of Mother-to-Child Transmission (PMTCT) program in Botswana, with the objective of assessing its effectiveness in reducing MTCT rates. The findings of this study affirmed the program's effectiveness in achieving a reduction in MTCT rates, reinforcing its critical role in preventing HIV transmission from mothers to their infants. However, it is important to note that this research also identified significant challenges in program implementation. These challenges included the high cost of treatment and the shortage of trained healthcare workers, which posed obstacles to the program's seamless execution. The study's findings thus underscored the need for targeted interventions and policy adjustments to overcome these implementation challenges, ensuring the continued success of the PMTCT program in Botswana.

### **Limited Resources and Patient Tracking Challenges: Logistical Complexities**

The PMTCT program faces logistical complexities related to limited resources and patient tracking. Key informants mentioned challenges in procuring essential supplies and in tracking patients who relocate or change contact information, leading to potential interruptions in treatment. Logistical challenges highlight the need for efficient supply chain management and robust patient tracking systems. These logistical complexities must be addressed to ensure the continuity of care. A program coordinator elucidated the logistical hurdles: "Resource constraints sometimes mean we can't always provide all the necessary support materials. Additionally, tracking patients who move can be challenging, leading to gaps in care." Thus, the challenges identified by key informants within the PMTCT program in the Mansa district encompass stigma and discrimination, inadequate healthcare infrastructure, medication adherence issues, difficulties in reaching remote areas, shortages of trained healthcare personnel, and logistical complexities related to resources and patient tracking. These challenges underscore the need for multifaceted interventions and targeted strategies to address the barriers hindering the program's effectiveness in preventing mother-to-child transmission of HIV. The findings of this study thus coincides with previous research findings such as that of Mukumbang et al., (2017) who conducted to understand the Factors that Influence the Integration of PMTCT Services in Lusaka, both facilitating and hindering factors were identified. This study emphasized the significance of healthcare provider training and support in promoting the successful integration of PMTCT services into broader healthcare systems, aiming to ensure seamless access to these critical interventions.

### **CONCLUSION**

In conclusion, the findings of this study have illuminated the complex and multifaceted nature of the Prevention of Mother-to-Child Transmission (PMTCT) program within the Mansa district. Key informants, who occupy pivotal roles within the program, have been instrumental in providing invaluable insights into its core components, recent advancements, encountered challenges, and proposed enhancements. These discussions have consistently underscored the paramount importance of early detection and timely intervention in the effort to prevent the transmission of HIV from mother to child.

The areas of focus within the PMTCT program, as elucidated by these informants, have highlighted the central role of antenatal care, HIV testing and counseling, the provision of antiretroviral therapy (ART), and diligent postnatal follow-up. These components collectively constitute a comprehensive strategy aimed at safeguarding the health and well-being of both mothers and children, with a particular emphasis on early identification and effective intervention.

Recent program developments signify an evolving and dynamic landscape within the PMTCT initiative. These advancements encompass improved access to rapid testing, the integration of maternal and child

health services, expanded community outreach endeavors, and initiatives focused on enhancing community awareness. These innovations underscore the program's commitment to adaptability and its pursuit of an extended reach into the community. Nevertheless, the challenges that impede the reduction of mother-to-child transmission of HIV are multifaceted and deeply entrenched. Informants have consistently pointed to issues such as stigma and discrimination, inadequacies in healthcare infrastructure, difficulties in maintaining medication adherence, geographic barriers, shortages of trained healthcare personnel, and logistical complexities as formidable obstacles to program effectiveness. These challenges emphasize the necessity of a multifaceted approach to overcome the barriers that hinder the success of the program.

In response to these challenges, key informants have put forth a set of recommendations that offer practical strategies to enhance the PMTCT program. These recommendations encompass a broader dissemination of community awareness and education, the strengthening of peer support networks, increased allocation of resources for improved transportation, and the provision of continuous training and sensitization programs for healthcare providers. These measures are crucial steps toward enhancing the program's efficacy and ensuring that it continues to positively impact the health and well-being of mothers and infants within the Mansa district.

In summation, the PMTCT program in the Mansa district is an indispensable tool in the prevention of mother-to-child transmission of HIV. While it has achieved significant milestones, it is not without its challenges. The insights provided by key informants stand as a valuable resource for advancing the program and emphasize the necessity of a comprehensive and adaptable approach to maternal and child health within the context of HIV prevention and care. The recommendations set forth by these informants should be carefully considered and implemented to further augment the program's influence and contribute to the overall welfare of mothers and infants in the region

## RECOMMENDATIONS

Based on the main findings of this study, the following specific recommendations were made to enhance the effectiveness of the program:

1. **Expanding Community Awareness and Education:** To combat the persistent stigma and discrimination associated with HIV/AIDS, it is imperative to launch comprehensive and accessible community awareness and education initiatives. These efforts should disseminate information about HIV transmission, prevention, and treatment widely. By empowering communities with knowledge, these initiatives can encourage early testing, improve adherence to treatment, and ultimately reduce mother-to-child transmission of HIV.
2. **Strengthening Peer Support Networks:** Recognizing the role of peer support networks in bolstering the program's impact, it is advisable to create and strengthen support groups for women living with HIV. These support groups can provide a platform for individuals to share their experiences, offer emotional support, and exchange practical advice. Such networks can mitigate the sense of isolation, promote a sense of belonging, and significantly enhance the mental and emotional well-being of program participants.
3. **Increasing Resources for Transportation:** Transportation challenges, particularly in remote areas, emerged as a significant barrier to accessing healthcare facilities. To address this issue, allocating additional resources for transportation options for pregnant women is essential. Adequate transportation solutions must be put in place to ensure that pregnant women can attend antenatal care and receive the necessary support without missing crucial appointments due to transport issues.
4. **Continuous Training and Sensitization:** Continuous training and sensitization of healthcare providers are crucial for program enhancement. Ongoing education is needed to keep healthcare teams updated on the latest advancements in HIV prevention and treatment. Sensitization programs



should be implemented to reduce stigma among healthcare workers themselves. Equipping healthcare providers with the latest knowledge and skills will enable them to provide the best possible care, while sensitization programs can create a more supportive and empathetic healthcare environment.

Incorporating these recommendations into the PMTCT program in the Mansa district can contribute to overcoming the challenges identified in reducing mother-to-child transmission of HIV. These multifaceted interventions aim to address the barriers hindering the program's success, promote community engagement, strengthen support networks, improve access to healthcare, and enhance the knowledge and sensitivity of healthcare providers. By implementing these practical strategies, the program can continue its critical role in safeguarding the health and well-being of mothers and infants in the region, ultimately leading to a significant reduction in mother-to-child transmission of HIV.

### Suggestions for Future Research

Based on the main findings, conclusions, and recommendations of this study on the Prevention of Mother-to-Child Transmission (PMTCT) program in the Mansa district, several suggestions for future and further research were made:

1. Longitudinal Impact Assessment: Conduct a longitudinal study to assess the long-term impact of the PMTCT program on children who were born to mothers enrolled in the program. Such research would provide insights into the health and development outcomes of these children as they grow, helping to evaluate the program's effectiveness over time.
2. Comparative Studies: Undertake comparative studies that assess the effectiveness of different PMTCT program models. This could involve comparing the outcomes of Option A and Option B+ programs or evaluating the effectiveness of PMTCT programs in different regions with varying levels of healthcare infrastructure and resources.
3. Qualitative Studies on Stigma: Conduct in-depth qualitative studies to gain a deeper understanding of the factors contributing to stigma and discrimination surrounding HIV/AIDS in the community. Investigate how stigma affects pregnant women's decision-making processes regarding HIV testing and treatment, as well as the impact of stigma on healthcare workers providing PMTCT services.

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